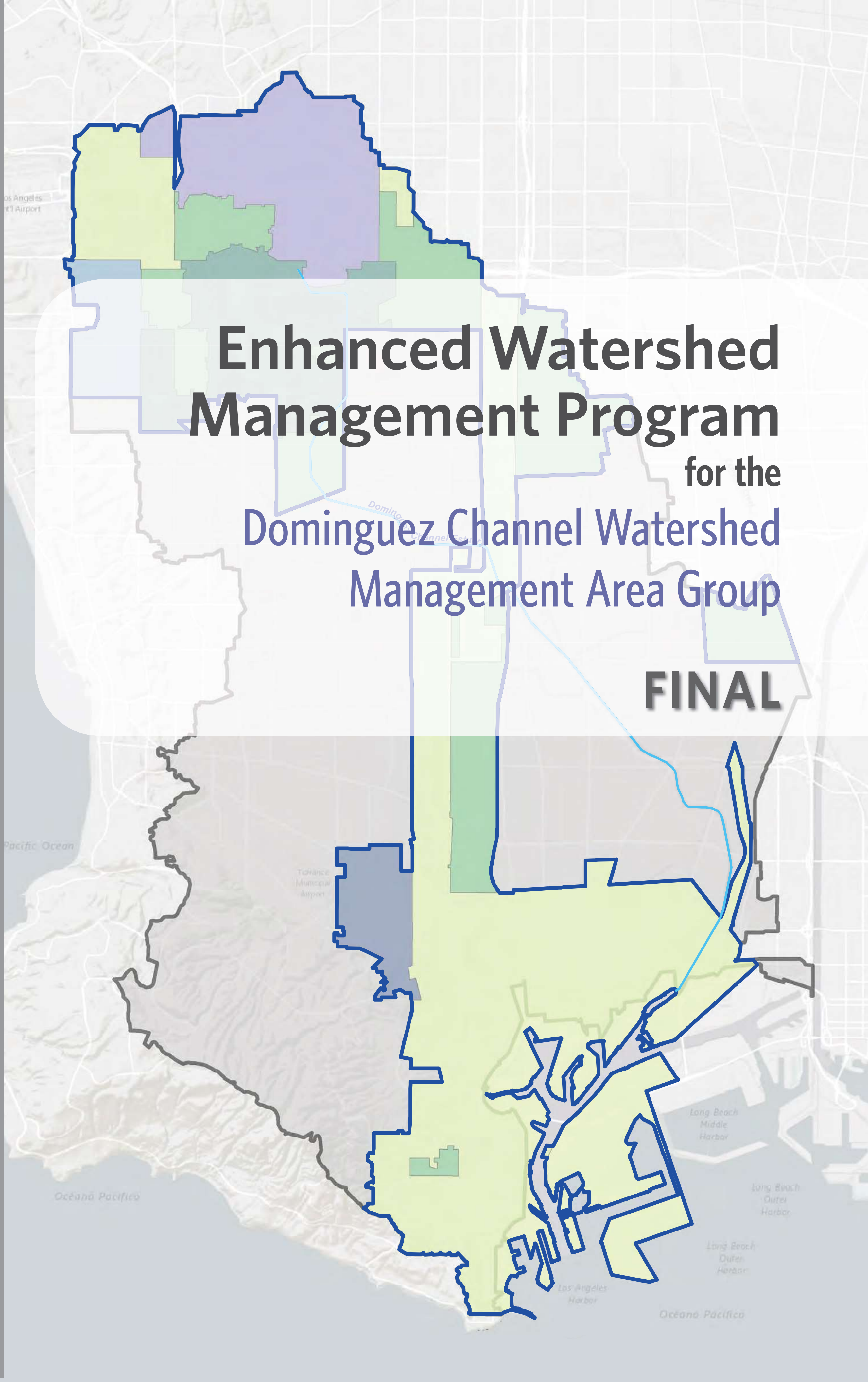
Enhanced Watershed Management Program

for the

Dominguez Channel Watershed Management Area Group

FINAL



FEBRUARY 2016

Enhanced Watershed Management Program
FOR THE DOMINGUEZ CHANNEL WATERSHED MANAGEMENT AREA GROUP

February 2016

FINAL

Prepared by: Dominguez Channel Watershed Management Area Group
City of Los Angeles
County of Los Angeles
Los Angeles County Flood Control District
City of Hawthorne
City of Inglewood
City of El Segundo
City of Lomita
City of Carson
City of Lawndale

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Acronyms

ARS	Automatic Retractable Screen
ASCE	American Society of Civil Engineers
BMP	Best Management Practice
BOE	Bureau of Engineering
CASQA	California Stormwater Quality Association
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CO	Current Organics
CPI	Catchment Priority Index
CPS	Connector Pipe Screen
CTR	California Toxics Rule
CWA	Clean Water Act
DC WMA	Dominguez Channel Watershed Management Area
DC WMG	Dominguez Channel Watershed Management Group
DWMMP	Dominguez Watershed Management Master Plan
EMC	Event Mean Concentration
ERL	Effect Range Low
ERM	Effect Range Median
ETo	Evapotranspiration
EWMP	Enhanced Watershed Management Program
GIS	Geographic Information System
GLAC	Greater Los Angeles County
GPS	Global Positioning System
HHWC	Household Hazardous Waste Collection
HO	Historical Organics
HRU	Hydrologic Response Units
HSPF	Hydrologic Simulation Program - FORTRAN
IC/ID	Illicit Connection/Illicit Discharge
IGP	Industrial General Permit
IRWMP	Integrated Regional Watershed Management Plan
LABOS	Los Angeles Bureau of Sanitation
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LARWQCB	Los Angeles Regional Water Quality Control Board
LB	Long Beach
LID	Low Impact Development
LSPC	Loading Simulation Program in C++
LWQMP	Lake Water Quality Management Plan
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MFAC	Minimum Frequency of Assessment and Collection
MOA	Memorandum of Agreement

MS4	Municipal Separate Storm and Sewer System
NCDC	National Climatic Data Center
NEXGEN	Next Generation Radar
NIMS	Nonlinearity-Interval Mapping Scheme
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
PIPP	Public Information and Participation Program
POLA	Port of Los Angeles
POLB	Port of Long Beach
PPP	Pollution Prevention Plan
QA/QC	Quality Assurance/Quality Control
RAA	Reasonable Assurance Analysis
RWL	Receiving Water Limitation
SBPAT	Structural BMP Prioritization and Analysis Tool
SCCWRP	Southern California Coastal Water Research Project
SIC	Standard Industrial Classification
SQO	Sediment Quality Objectives
SRP	Spill Response Plan
SUSMP	Standard Urban Stormwater Mitigation Plan
SUSTAIN	System for Urban Stormwater Treatment and Analysis Integration
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Storm Water Management Model
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TBD	To Be Determined
TIWRP	Terminal Island Water Reclamation Plant
TMDL	Total Maximum Daily Load
TSO	Time Schedule Order
USEPA	United States Environmental Protection Agency
WBPC	Water Body-Pollutant Combination
WDR	Waste Discharge Requirement
WLA	Waste Load Allocation
WMA	Watershed Management Area
WMMS	Watershed Management Modeling System
WMP	Watershed Management Program
WQBEL	Water Quality Based Effluent Limitation
WQO	Water Quality Objective

Units

µg/kg	Microgram per kilogram
µg/L	Microgram per liter
cfu	Colony Forming Unit
g/day	Grams per day
g/yr	Grams per year
kg	Kilogram
kg/yr	Kilograms per year
mg/L	Milligram per liter
mg/kg	Milligram per kilogram
mL	Milliliter
MPN	Most Probable Number
TUc	Toxic Unit Chronic

1. Introduction

The Dominguez Channel Watershed Management Area Group (DC WMG) has developed this Enhanced Watershed Management Program (EWMP) pursuant to the requirements set forth by Order No. R4-2012-0175, Los Angeles County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit (MS4 Permit). This section describes the applicability of the EWMP, watershed background and geographical characteristics, regulatory requirements set forth by the MS4 Permit, the EWMP development process, and an overview of this EWMP.

1.1 Applicability of EWMP

The agencies participating in this EWMP are the Cities of Carson, El Segundo, Hawthorne, Inglewood, Lawndale, Lomita and Los Angeles, the unincorporated areas of the County of Los Angeles, and the Los Angeles County Flood Control District (LACFCD). The area break down for the DC WMG is provided in Table 1.1. Figure 1-2 shows the Dominguez Channel Watershed Management Area (WMA) boundaries and the delineations of the areas of the DC WMG agencies participating in the development of this EWMP. Figure 1-2 illustrates the boundaries of the jurisdictions within the DC WMG area. Additionally other MS4 Permittees in the watershed that are not participating in this EWMP are shown in Figure 1-2. This EWMP is voluntarily submitted to assist the Los Angeles Regional Water Quality Control Board (LARWQCB) in implementing the DC and LA Harbor Waters Toxics Pollutants TMDL[1].

Table 1.1: DC WMG Area

DC WMG Member	Total Area (acres)	Percent of Group
City of Carson	12,016.61	23.63%
City of El Segundo	1,252.18	2.46%
City of Hawthorne	3,891.93	7.65%
City of Inglewood	3,884.28	7.64%
City of Lawndale	1,265.86	2.49%
City of Lomita	1,227.70	2.41%
City of Los Angeles	19,177.30	37.71%
Los Angeles County	8,140.91	16.01%
LACFCD	N/A	N/A
Total	**50,856.77**	**100%**

[1] The DC WMG has entered into an Amended Consent Decree with the United States and the State of California, including the LARWQCB, pursuant to which the LARWQCB has released the DC WMG from responsibility for toxic pollutants in the DC and the harbors (NOAA 1999). Accordingly, no inference should be drawn from the submission of this EWMP or from any action or implementation taken pursuant to it that the DC WMG is obligated to implement the TMDL, including this EWMP or any of the TMDL's other obligations or plans, or that the DC WMG has waived any rights under the Amended Consent Decree. See Attachment A for additional information.

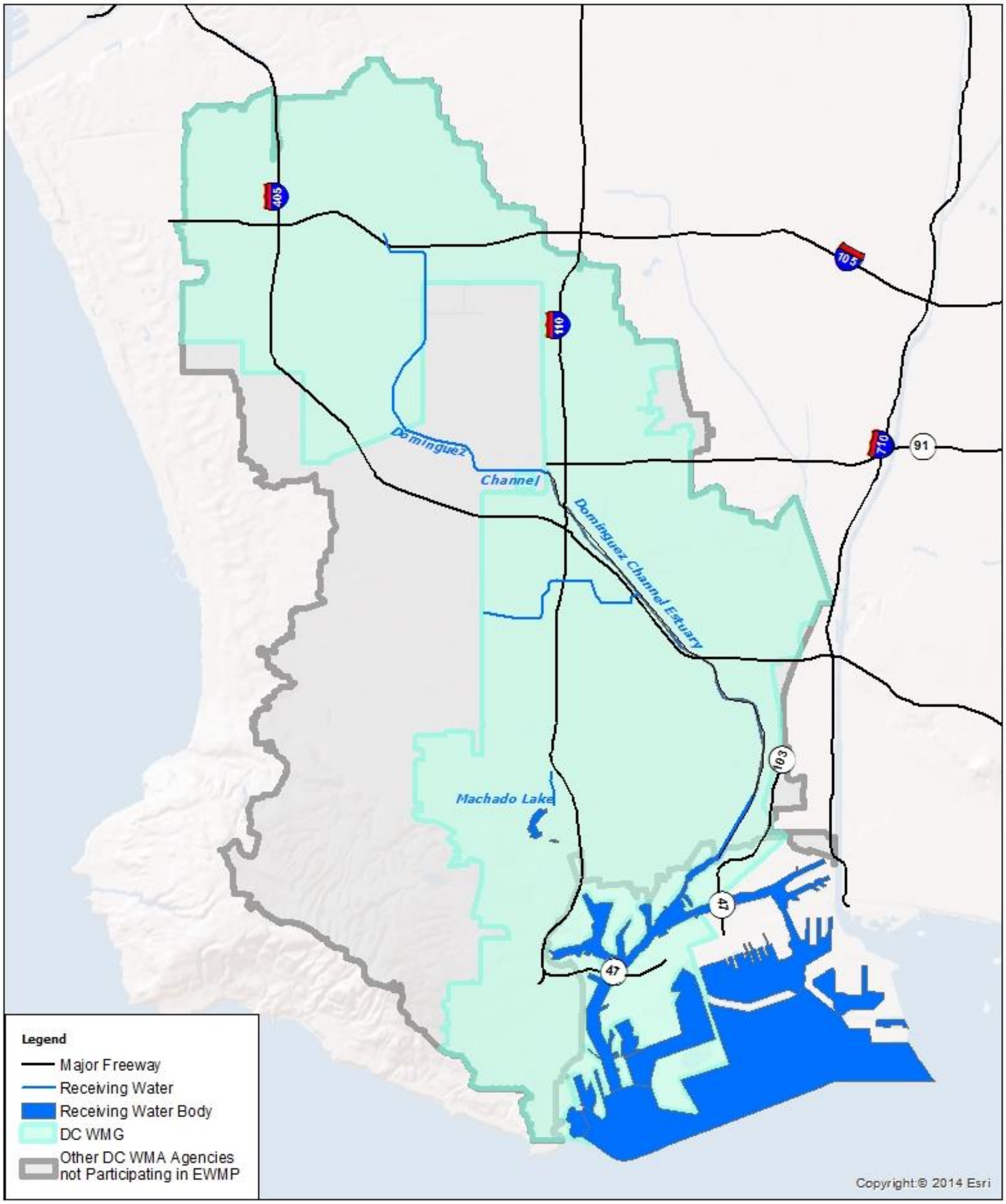

Figure 1-1: Dominguez Channel Watershed Management Area

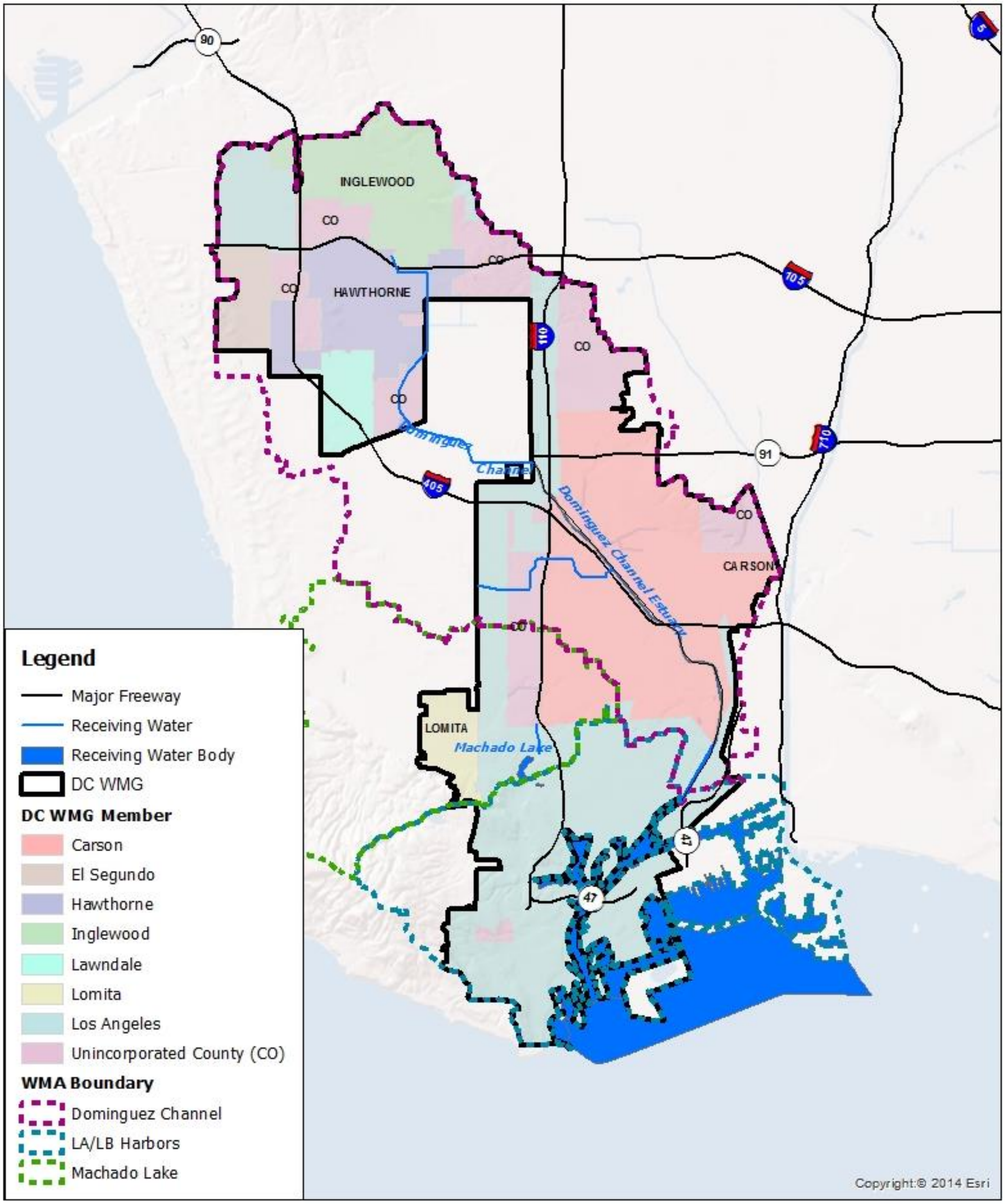

Figure 1-2: DC WMG Jurisdictions

1.2 Geographic Scope and Characteristics

The physical and hydrologic watershed characteristics of the Dominguez Channel WMA are discussed below. In addition, the extent of the MS4 and receiving waters addressed by this EWMP are also discussed.

The city of Carson also has small areas that drains to the LA River and Compton Creek, and those areas are covered under this EWMP. Unique Water Quality Priorities (Section 2) and EWMP schedule (Section 5) are identified for those areas of Carson.

1.2.1 Watershed Characteristics

The Dominguez Channel WMA is located within the southern portion of Los Angeles County, California, and encompasses approximately 133 square miles of land and water, including the Dominguez Channel Watershed, the Machado Lake Watershed, and the Los Angeles/Long Beach Harbors Watershed as demonstrated in Figure 1-2. The DC WMG accounts for just over 78.8 square miles, approximately 42 percent of the Dominguez Channel WMA. Table 1.2 and Attachment B, Figure B.3 present the land use break down within the DC WMG.

Table 1.2: DC WMG Land Use

Land Use Category	Area (square miles)	Percentage
Agriculture	0.6	0.7%
Commercial	15.7	19.9%
Industrial	13.9	17.7%
Multi-Family Residential	9.5	12.1%
Single Family Residential	21.9	27.8%
Open	6.3	8.0%
Other Urban	10.9	13.8%
Total	**78.8**	**100%**

The hydrologic characteristics of the DC WMG include:

- Low relief terrain except in the southwest (Attachment B, Figure B.4);
- Fully built-out area with a high percentage of impervious area except in the southwest (Attachment B, Figure B.4);
- Soil types ranging from clay to fine sand based on the Los Angeles County Hydrology Manual (2006) (Attachment B, Figure B.5). Surficial soil infiltration rates ranging from 0.027 to 0.81 inches per hour;
- 50 year, 24 hour storm intensity range from approximately 4.6 inches per hour in the southeast that increases to 6.2 inches per hour in the northwest, as indicated by the 50-year, 24-hour rainfall intensity distribution map (Attachment B, Figure B.6); and
- 85th percentile 24 hour Storm depth ranging from approximately 0.25 inches in the south that increases to the north with a local high point over the Palos Verde Hills of 1.05 inches, as indicated by the 85th percentile, 24-hour rainfall depth distribution map (Attachment B, Figure B.7).

1.2.2 Water Body Characteristics

The DC WMG is tributary to the water bodies listed below, which have been assessed by the State Water Resources Control Board (State Board). A figure illustrating these water bodies can be found in Attachment B, Figure B.8 and Figure B.9 and a summary of the major characteristics can be found in Table 1.3.

- Dominguez Channel
  - Dominguez Channel (lined portion above Vermont Avenue)
  - Dominguez Channel Estuary (unlined portion below Vermont Avenue)
  - Torrance Carson Channel (Torrance Lateral)
- Machado Lake
  - Machado Lake
  - Wilmington Drain
- Los Angeles Harbor
  - Inner Cabrillo Beach
  - Consolidated Slip

1.2.2.1. Dominguez Channel

The lined portion of the Dominguez Channel above Vermont Avenue is 6.7 miles, spanning from West 116th Street near Interstate 105 to Vermont Avenue near Interstate 110 (USEPA, 2014b). Approximately three miles of the lined portion of the Dominguez Channel are within the DC WMG jurisdiction. The Water Quality Control Plan for the Los Angeles Region (LARWQCB, 1994, amended November 10, 2011) (Basin Plan) has identified the existing beneficial uses as RARE and REC-2 and potential beneficial uses as WARM, WILD, and REC-1 for the lined portion of the Dominguez Channel (see footnote for Table 1.3 for definitions of these abbreviations). Further downstream, below Vermont Avenue, is the unlined portion of the Dominguez Channel commonly referred to as the Dominguez Channel Estuary. The Estuary is 8.2 miles in length spanning from the downstream end of the lined portion of the Dominguez Channel to the Los Angeles Harbor, just south of Anaheim Street and west of Interstate 710 (USEPA, 2014b). Approximately 2.2 miles of the Dominguez Channel Estuary is within the DC WMG jurisdiction. The Basin Plan has identified the existing beneficial uses as presented in Table 1.3. The Torrance Carson Channel, also referred to as Torrance Lateral, is 3.4 miles in length and tributary to the Dominguez Channel Estuary. The Torrance Lateral spans from Western Avenue south of Torrance Boulevard to its confluence with the Dominguez Channel Estuary near Avalon Boulevard and Interstate 405. 1.8 miles of the Torrance Lateral is within the DC WMG jurisdiction. The water quality associated with these water bodies is discussed in Section 2 Water Quality Priorities.

1.2.2.2. Machado Lake

Machado Lake is considered a freshwater reservoir or lake approximately 40 acres in size located adjacent to Vermont Avenue south of its intersection with Pacific Coast Highway (USEPA, 2014b). Machado Lake is comprised of upper and lower basins separated by a lower earthen dam. The upper basin contains the 40-acre recreational lake created by the impoundment of stormwater runoff while the lower basin is a seasonal freshwater marsh of roughly 63 acres. The Wilmington Drain is a LACFCD facility managed by Los Angeles County Department of Public Works (LACDPW) tributary to Machado Lake. The earthen bottom section is characterized as a soft bottom vegetated channel, approximately 3,000 feet long. This portion of Wilmington Drain spans from Pacific Coast Highway to just north of Lomita Boulevard, bordered by mostly residential land uses to the west and the Interstate 110 to the east. Just south of Interstate 110 and upstream, the channel is concrete lined. Beneficial uses for the Wilmington Drain are not explicitly defined in the Basin Plan. Therefore beneficial uses for the Wilmington Drain, based on the tributary rule (Basin Plan, page 2-4), are assumed to be the same as Machado Lake. The water quality associated with these water bodies is discussed in Section 2.

1.2.2.3. Los Angeles Harbor

There are many components that make up the Los Angeles Harbor as a whole, as illustrated in Attachment B, Figure B.8 and the Los Angeles Harbor watershed is more than just the Harbor District. The Dominguez Channel WMA empties into the northeast side of the Consolidated Slip, the most upstream portion of the Los Angeles Harbor, located downstream of the Dominguez Channel Estuary near Anaheim Street west of Interstate 710 and spans to Shore Road where it confluences with the Los Angeles Inner Harbor. This portion of the harbor is approximately 0.06 square miles, 13.5 acres (USEPA, 2014b). The Basin Plan designates beneficial uses to "all other inner areas", including the Consolidated Slip. These beneficial uses are shown in Table 1.3. The Los Angeles Inner Harbor is approximately 3,003 acres and is located downstream of the Consolidated Slip. The Inner Harbor includes portions of both the Los Angeles Harbor and Long Beach Harbor (USEPA, 2014b). The Fish Harbor, which is located within the Los Angeles Harbor area, is approximately 0.14 square miles, 91 acres, located east of the harbor near Wharf Street, is also considered part of the Inner Harbor area (USEPA, 2014b) and has the same beneficial uses. The inner and outer portions of Cabrillo Beach are also a part of the Los Angeles Harbor. Inner Cabrillo Beach is considered a bay/harbor and is located to the west of Fish Harbor, adjacent to Shoshonean Road, approximately 0.13 square miles, 82 acres. Outer Cabrillo Beach is considered a coastal shoreline approximately 0.58 miles long on the south side of the peninsula bordering inner and outer Cabrillo Beach (USEPA, 2014). Outer Cabrillo Beach, while in the LA Harbor watershed, is a Los Angeles County beach not part of the Harbor District. The water quality associated with the Los Angeles Harbor water bodies is discussed in Section 2.

Table 1.3: Summary of DC WMG Water Bodies*

Water Body		**Existing Beneficial Uses**	**Potential Beneficial Uses**
Dominguez Channel	Lined portion above Vermont Avenue (Freshwater)	RARE, REC-2	WARM, WILD, REC-1, MUN[1]
	Unlined portion below Vermont Avenue (Estuary)	COMM, EST, MAR, WILD, RARE, MIGR, SPWN, REC-1, REC-2	NAV
	Torrance Carson Channel[2]	RARE, REC-2	WARM, WILD, REC-1, MUN[1]
Machado Lake	Machado Lake	WARM, WILD, WET, REC-1, REC-2	None
	Wilmington Drain[3]	WARM, WILD, WET, REC-1, REC-2	None
Los Angeles Harbor[4]	Consolidated Slip	IND, NAV, REC-2, COMM, MAR, RARE	REC-1, SHELL
	Inner Harbor	IND, NAV, REC-2, COMM, MAR, RARE	REC-1, SHELL
	Fish Harbor	IND, NAV, REC-2, COMM, MAR, RARE	REC-1, SHELL
	Inner Cabrillo Beach	NAV, REC-1, REC-2, COMM, MAR, WILD, MIGR, SPWN, SHELL	None
	Outer Cabrillo Beach (Los Angeles County beach)	NAV, REC-1, REC-2, COMM, MAR, WILD, MIGR, SPWN, SHELL	None

* Abbreviations defined:
COMM – Commercial and Sport Fishing
EST – Estuarine Habitat
REC-1 – Water Contact Recreation
REC-2 – Non-Contact Water Recreation

Table 1.3: Summary of DC WMG Water Bodies*		
Water Body	**Existing Beneficial Uses**	**Potential Beneficial Uses**

IND – Industrial Service Supply
NAV - Navigation
MAR – Marine Habitat
MIGR – Migration of Aquatic Organisms
MUN – Municipal and Domestic Supply
RARE – Rare, Threatened, or Endangered Species
SHELL – Shellfish Harvesting
SPWN – Spawning, Reproduction, and/or Early Development
WARM – Warm Freshwater Habitat
WET – Wetland Habitat
WILD – Wildlife Habitat

[1] MUN designation is P*. Associated water quality objectives are not applicable until such time as the use is confirmed.
[2] Beneficial uses based on TMDL Staff Report (LARWQCB, 2011).
[3] Beneficial uses based on the tributary rule (LARWQCB, 1994).
[4.] Los Angeles Harbor is not the Harbor District. Los Angeles Harbor is the body of water downstream of the Dominguez Channel Estuary.

1.3 Regulatory Framework

The LARWQCB (or Regional Board) adopted Waste Discharge Requirements (WDRs) for MS4 discharges within the Coastal Watersheds of Los Angeles County on June 18, 1990, (Order No. 90-079; NPDES Permit No. CA0061654). The WDRs were later amended on December 13, 2001 (Order No. 01-182; NPDES Permit No. CAS004001 (as amended)). The current MS4 Permit (Order No. R4-2012-0175; NPDES Permit No. CAS004001) was adopted on November 8, 2012 and became effective on December 28, 2012. The MS4 Permit contains effluent limitations, receiving water limitations (RWLs), Minimum Control Measures (MCMs), Total Maximum Daily Load (TMDL) provisions, and outlines the process for developing watershed management programs (WMPs), including the EWMP. The MS4 Permit incorporates the TMDL Waste Load Allocations (WLAs) applicable to dry- and wet-weather as Water Quality-Based Effluent Limitations (WQBELs) and/or Receiving Water Limitations (RWLs). Part V.A (pages 38-39) of the MS4 Permit requires compliance with the WQBELs and/or RWLs as outlined in the respective TMDLs.

1.3.1 Relevant TMDLs

A TMDL is a regulatory term used to describe a value of the maximum amount of a pollutant that a water body can receive while still meeting water quality standards. Attachment N of the MS4 Permit, titled "TMDLs in Dominguez Channel and Greater Harbor Waters Watershed Management Area" lists information on TMDLs and incorporates WQBELs and RWLs relevant to the DC WMG including the TMDLs identified in Table 1.4.

Table 1.4 demonstrates which DC WMG members are affected by each of the TMDLs per Attachment K, Table K.4, of the MS4 Permit. The Water Quality Objectives (WQOs) associated with each of the TMDLs are included in Attachment C.

Table 1.4: Applicability of DC WMG TMDLs

DC WMG Participating Agency	Los Angeles Harbor Bacteria TMDL	Machado Lake Trash TMDL	Machado Lake Nutrient TMDL	Machado Lake Pesticides and PCBs TMDL	DC and LA Harbor Waters Toxic Pollutants TMDL
City of Carson	X	X	X	X	X
City of El Segundo					X
City of Hawthorne					X
City of Inglewood					X
City of Lawndale					X
City of Los Angeles	X	X	X	X	X
City of Lomita		X	X	X	
County of Los Angeles	X	X	X	X	X
LACFCD	X	X	X	X	X

1.4 EWMP Development Process

According to Part VI.C.1.f.v (page 48) of the MS4 Permit, each watershed management program (WMPs and EWMPs) must provide appropriate opportunity for meaningful stakeholder input, including, but not limited to, a permit-wide watershed management program Technical Advisory Committee (TAC) that will advise and participate in the development of the EWMP. The DC WMG has been part of the TAC and has provided input on the various topics discussed. Additionally the DC WMG worked with local and regional stakeholders to receive input for the EWMP process.

The DC WMG developed a list of stakeholders in order to establish the stakeholder participants, as well as provide guidance on how to engage the identified key stakeholders. The stakeholders include:

- Key administrators, stormwater program managers, council districts, and neighborhood councils.;
- Environmental and community organizations, business associations; and
- Collaborating governmental agencies such as the Regional Board, USEPA Region IX, water districts, and other WMP or EWMP agencies.

A series of three EWMP stakeholder workshops were held jointly with EWMP groups for the Los Angeles River, Ballona Creek, Marina del Rey, Santa Monica Bay Jurisdictions 2 and 3 watersheds. The workshops were conducted, on April 10, 2014, November 20, 2014, and March 19, 2015. Each workshop was held at the Witherbee Auditorium at LA Zoo. More than 500 invitations were sent out to stakeholders. Workshop No. 1 was intended to initiate the process for receiving input from a broad stakeholder group. The agenda consisted of introducing the planned EWMP stakeholder process, explaining the relevance and context of the EWMP process, and solicit input from stakeholders for the Draft EWMP Work Plan and potential projects.

The second workshop discussed the planning progress, discussed the regional projects identified to date, and continued to solicit input from the stakeholders on regional project opportunities, planning criteria to incorporate, the additional benefits sought from the EWMP projects, and other desired outcomes from the program.

The third workshop discussed the draft EWMP, the projects identified, the load reductions that would occur from project implementation, any additional benefits communities would see from implementation of the projects, and the schedules and costs for implementation of the EWMP. Additional information can be found in Attachment D.

The following preparation was conducted for the workshops:

- Meeting notices (one page flier) distributed via email to identified stakeholders and posted on the City of Los Angeles a website for EWMP materials and activities at least one month prior to the workshop;
- Material for each workshop distributed and posted to the www.lastormwater.org website;
- A draft workshop summary, including presentation materials, distributed no later than two weeks after each workshop to solicit additional stakeholder feedback;
- Locations of the workshops that are reasonably accessible and accommodates up to 250 attendees;

In addition to distributing workshop material through the Los Angeles Stormwater website, the DC WMG also set up a web site where interested persons could upload project proposals. This facilitated community inputs into the project development process.

1.5 EWMP Overview

In June 2014, the EWMP Work Plan was developed as required as part of the DC WMG EWMP development process per Part VI.C.4.c.iv (page 57) of the MS4 Permit.

The EWMP Work Plan documented the progress thus far in the development of the EWMP by detailing the water quality priorities within the DC WMG, identifying the existing and potential control measures, outlining the approach to identifying additional projects, and outlining the approach to the RAA. The purpose of identifying significant watershed characteristics and presenting an approach was so that stakeholders could become involved, and feedback could be solicited and incorporated into the EWMP.

That EWMP Work Plan was used as the framework for this EWMP. This EWMP provides the results of the efforts outlined in the EWMP Work Plan and includes the relevant previous information as well as the final RAA, projects for implementation consideration, a framework for assessment and adaptive management, cost and financial strategies, and a discussion on legal authority. This EWMP includes the following sections:

- **Water Quality Priorities (Section 2)**
  The receiving waters are identified and characterized based on the available water quality data. Water body Pollutant Classifications are developed so that each water body-pollutant combination can be classified into an appropriate category in order to develop an approach to prioritizing the identified water quality priorities.
- **Reasonable Assurance** Analysis Approach **(Section 3)**
  The modeling system and approach to conducting the RAA is presented in this section. The modeling system being used by the DC WMG is highlighted along with the process and modeling approach. The spatial domain, time period, water quality, and Best Management Practices (BMPs) model integration are described. Lastly, the output from the RAA is detailed and examples are provided.
- **Watershed Control Measures (Section 4)**
  This section outlines the existing and planned control measures. Watershed control measures consist of both structural and non-structural BMPs. Existing BMPs are identified in order to identify potential regional projects already under way. The current and future minimum control measures are described and presented. Planned regional and distributed projects are presented.
- **EWMP Implementation (Section 5)**
  This section presents schedules for project implementation and how the RAA predicts the resulting load reductions that are expected to meet TMDL milestones and milestones established in this EWMP to address non-TMDL water quality priorities.
- **Assessment** and Adaptive Management Framework **(Section 6)**
  This section outlines the assessment and adaptive management framework of the EWMP. This guides the implementation team in the steps to take to assess the effects of the EWMP on water quality and adjust planned projects to achieve the planning and water quality objectives. Additionally, the linkage between the assessment and the reporting requirements of the Permit is also established.
- **EWMP Implementation Costs and Financial Strategy (Section 7)**
  This section summarizes the costs of implementing the EWMP. Cost ranges were developed for the implementation, operation, and maintenance of the selected BMPs. A summary of potential funding sources or strategies to implement the EWMP is also presented.
- **Legal Authority (Section 8)**
  This section demonstrates that Permittees have the necessary legal authority to implement the BMPs identified in the EWMP or the legal authority exists to compel implementation of the BMPs.

2. Water Quality Priorities

Identification of the water quality priorities in the DC WMG is a key component of the EWMP process. Part VI.C.5.a (page 58-60) of the MS4 Permit outlines the pertinent elements of the prioritization process as follows:

1. Water quality characterization (VI.C.5.a.i, page 58) based on available monitoring data, TMDLs, 303(d) lists, storm water annual reports, etc.;
2. Water body-pollutant classification (VI.C.5.a.ii, page 59) to identify water body-pollutant combinations that fall into three MS4 Permit-defined categories;
3. Source assessment (VI.C.5.a.iii, page 59) for the water body-pollutant combinations in the three categories; and
4. Prioritization of the water body-pollutant combinations (VI.C.5.a.iv, page 60).

The three MS4 Permit defined categories are:

- **Category 1** (Highest Priority): Water body-pollutant combinations for which TMDLs are established in Part VI.E (page 141) and Attachment N of the MS4 Permit.
- **Category 2** (High Priority): Pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's CWA Section 303(d) List (State Listing Policy) and for which MS4 discharges could potentially be contributing to the impairment.
- **Category 3** (Medium Priority): Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which have exceeded applicable receiving water limitations contained in the MS4 Permit and for which MS4 discharges could potentially be contributing to the exceedance.

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

2.1 Water Quality Characterization

Water quality monitoring data and reports were gathered for the Dominguez Channel water body segments (including the lined portion above Vermont Avenue, the unlined Dominguez Channel Estuary, and the Torrance Lateral), the Machado Lake water body segments (including the Wilmington Drain), and the Los Angeles Harbor (including the Consolidated Slip and Cabrillo Beach). The raw data available was assessed for quality and compiled into a database by wet-weather and dry-weather conditions and locations. Sources for this data included:

- LACDPW Dominguez Channel MS4 NPDES Mass Emission Monitoring;
- AMEC's Port of Los Angeles (POLA) Artesia Pollutograph Study;
- City of Los Angeles Bureau of Sanitation (LABOS) Special Ammonia Sampling and Status and Trends Monitoring Programs in the Dominguez Channel; and
- LABOS Machado Lake Water Quality Monitoring Program and Nutrient TMDL Monitoring Program.

The sampling locations for the data are shown in Figure 2-1: and Figure 2-2. Additional details regarding the available data, including which sampling effort was conducted at each site, are presented in Attachment E.

In addition to the sampling data, additional water and sediment quality monitoring reports were collected and reviewed as part of the characterization and are included in Attachment E.

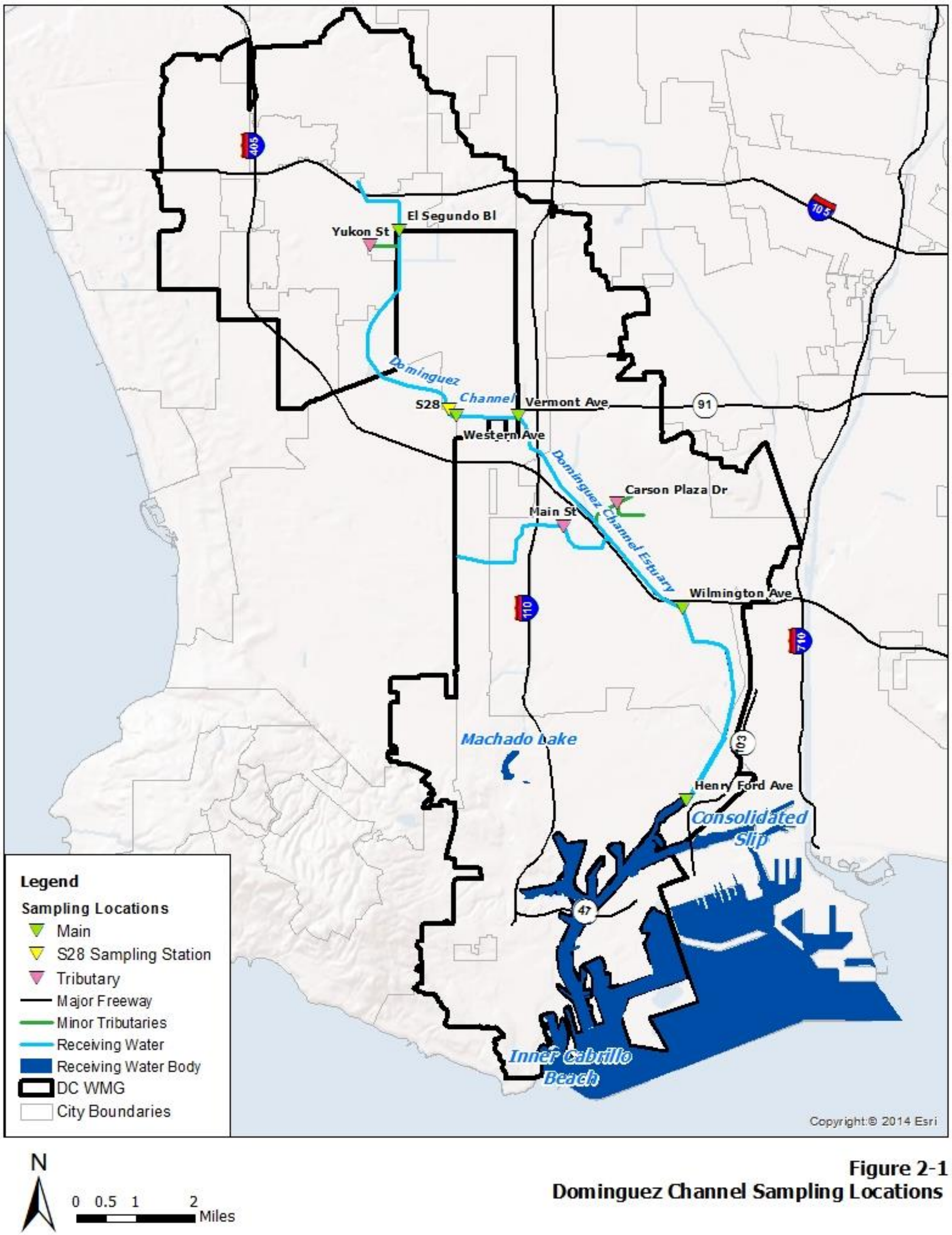

Figure 2-1: Dominguez Channel Sampling Locations

Figure 2-2: Machado Lake Sampling Locations

The data analysis applied screening criteria for potential and existing beneficial uses. In doing so, water quality monitoring samples from the lined portion of the Dominguez Channel were screened against criteria applicable for the protection of REC-1 beneficial uses, which is a potential beneficial use for this receiving water, in addition to criteria for the protection of aquatic life. Criteria for the protection of human health for the consumption of organisms only were applied to segments with either existing or potential REC-1 beneficial uses under both dry- and wet-weather conditions. Where human health criteria were not applicable or established, chronic water quality criteria for the protection of aquatic life were applied to dry-weather samples and acute water quality criteria were applied to wet-weather samples to account for the shorter exposure period consistent with TMDLs in the region.

Water body segments were classified as either freshwater or saltwater to apply the correct WQOs. The lined portion of the Dominguez Channel, as well as tributaries (i.e., the Torrance Lateral), were classified as freshwater, while portions of the Los Angeles Harbor were classified as marine (saltwater). Due to tidal influence in the estuarine portion of the WMA and a lack of salinity data at the sampling locations in the Estuary, water quality samples from the Estuary were screened against both salt and freshwater criteria and the more stringent of the two criteria under the physical conditions at the time of sampling was used. Future confirmation of the salinity level at these monitoring locations can further refine these assumptions.

Hardness measurements at the time of sampling were used to calculate hardness-dependent dissolved metals WQOs. When hardness was not recorded, the median hardness for dry-weather samples at each sample site was used for dry-weather conditions and a value of 50 mg/L was used for wet-weather based on the hardness used in the TMDL for Toxic Pollutants in the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters.

2.1.1 Characterization of Receiving Water Quality

Statistical summaries of the water quality monitoring (raw) data are presented in Attachment E. Tables of the observed exceedances over the monitoring period and exceedances over the past five years (starting in January 2008) are included in Attachment E. For details on the WQOs utilized to measure exceedances, refer to the Attachment E.

The monitoring reports reviewed during the water quality characterization were for the Dominguez Channel, Machado Lake and Los Angeles Harbor areas. For those programs that investigated sediment quality, exceedances of the Effect Range Low (ERL) sediment quality thresholds were used to assess water body impairment. It was also noted if chemical concentrations exceeded the higher Effect Range Median (ERM) threshold. Significant findings from these reports are summarized in Table 2.1, Table 2.2, and Table 2.3 for the Dominguez Channel water body segments, Machado Lake water body segments, and the Los Angeles Harbor water body segments respectively.

Table 2.1: Summary of Exceedances for Monitoring Programs for the Dominguez Channel			
Water Body	**Program**	**Date Range**	**Exceedances**
Dominguez Channel	LACDPW NPDES MS4 Stormwater Monitoring	2008-2013	Wet-weather: Copper (diss.), Lead (diss.), and Zinc (diss.), Cyanide, Fecal coliforms, pH Dry-weather: Cyanide, Fecal coliforms, E. coli, pH
	LACDPW NPDES MS4 Stormwater Monitoring	2002-2008	Wet weather: Copper (diss.), Lead (diss.), and Zinc (diss.)
	LACDPW NPDES MS4 Stormwater Monitoring	2002, 2003, 2005	Water column toxicity
	LACDPW NPDES MS4 Stormwater Monitoring	Pre- 2005	Diazinon
	SWAMP	2003	pH
	Consolidated Slip Restoration Project Concept Plan Supplemental Report	2002	Sediment (ERM): Zinc
Torrance Lateral	LACDPW NPDES MS4 Stormwater Monitoring	2008-2012	Wet-Weather: Copper (diss.), Lead (diss.), and Zinc (diss.), Cyanide, Fecal coliforms, pH Dry-Weather: Fecal coliforms, pH, ammonia
	Consolidated Slip Restoration Project Concept Plan Supplemental Report	2002	Sediment (ERM): Lead, Zinc, DDT, PCBs, and PAHs
Dominguez Channel Estuary	Consolidated Slip Erosion Study	2011	Sediment (ERM): Chromium, Copper, Lead, Zinc, Mercury, Silver, DDT, PCBs, Chlordane, Dieldrin Sediment (ERL): Arsenic, Cadmium, Chromium, Copper, Lead, Zinc, Mercury, Nickel, Silver, Total PCBs, DDT, PAHs, Chlordane, and Dieldrin
	Surface Water Ambient Monitoring Program (SWAMP) Report	2003	Benthic community effects
	Consolidated Slip Restoration Project Concept Plan Supplemental Report	2002	ERM: Copper, Lead, Zinc, DDT, and PCBs

Table 2.2: Summary of Exceedances for Monitoring Programs for Machado Lake			
Water Body	**Program**	**Date Range**	**Exceedances**
Machado Lake	Machado Lake Nutrients and Toxics TMDL Lake Water Quality Management Plan (Regional Board sediment data set)	2009	Sediment: Chlordane, Total DDT, Total PCBs
	SWAP Report	2003	Dissolved Oxygen
Wilmington Drain	Regional Board Sediment Data	2008	Sediment: Chlordane, Total DDT, Dieldrin
	Wilmington Drain Sediment Characterization Study	2007	Sediment: Chlordane, Total DDT, Total PCBs

Table 2.3: Summary of Exceedances for Monitoring Programs for the Los Angeles Harbor			
Water Body	**Program**	**Date Range**	**Exceedances**
LA Harbor	Southern California Bight Regional Monitoring Program	2008	Sediment (ERL): DDT, Copper
	Southern California Bight Regional Monitoring Program	2003	Sediment (ERL): DDT, Copper, Nickel, Mercury, Sediment Toxicity
Inner Harbor	POLA/POLB Sediment Survey	2006	Copper (diss.), DDT (diss.)
	SWAMP Report	2003	Silver (diss.)
	Southern California Bight Regional Monitoring Program	2003	PCBs
Outer Harbor	City of LA Terminal Island Water Reclamation Plant (TIWRP) Biennial Assessment Report	2010-2011	Sediment (ERL): Cadmium, Copper, Nickel, DDT, Total PCBs
	TIRP Biennial Assessment Report	2008-2011	Total PCBs (tissue), Total DDT (tissue)
	POLA/POLB sediment survey	2006	Copper (diss.), DDT (diss.)
	SWAMP Report	2003	Silver (diss.)
Consolidated Slip	Consolidated Slip Erosion Study	2011	Sediment (ERM): PCBs, DDT, Chlordane, Dieldrin Sediment (ERL): Arsenic, Cadmium, Chromium, Copper, Lead, Zinc, Mercury, Nickel, Silver, Total PCBs, DDT, PAHs, Chlordane, Dieldrin
	SCCWRP Atmospheric Deposition in LA/LB Harbor study	2006	Total DDT (diss.) and Total PCBs (diss.)
	Consolidated Slip Restoration Project Concept Plan Supplemental Report	2002	Sediment (ERM): Copper, Lead, Zinc, Mercury, Total PCBs, DDT, PAHs, Chlordane and Dieldrin

2.1.2 Characterization of Discharge Quality

Stormwater and non-stormwater discharges were characterized based on available data. The available receiving water monitoring data was used to evaluate potential stormwater and non-stormwater discharge data. Water quality data were obtained from the Los Angeles County Department of Public Works (LACDPW), the Port of Los Angeles (POLA), and the City of Los Angeles Department of Public Works, Bureau of Sanitation (LABOS). Monitoring data were available from the mass emission station in Dominguez Channel at Artesia from 2002-2012. Monitoring data from Torrance Lateral leading to Dominguez Channel was available from 2007-2009. Six other tributary's monitoring data were available from 2009-2011. Data from Machado Lake monitoring was available from 2001-2009. Other studies and data were available from studies in the Dominguez Channel estuary, the Consolidated Slip, Inner Harbor, Outer Harbor, Fish Harbor, and the Wilmington Drain, but most studies were for shorter sampling periods. It is important to note that most of these monitoring data were from receiving water sampling stations. In this subsection, discharge water quality is evaluated on the basis of receiving water sampling results. The connection between the effects of discharges on receiving water quality cannot be established until more outfall monitoring data is available. This assessment of discharge quality is tentative and will be confirmed as the Coordinated Integrated Monitoring Program (CIMP) is implemented.

The data were compared to water quality criteria to evaluate the number of exceedances. These are reported in Attachment E. In summary in the Dominguez Channel and Torrance Lateral:

- Wet weather samples exceeded dissolved metals hardness-adjusted CTR criteria for copper, lead, and zinc. No exceedances were observed for the three metals during dry weather. No exceedances were observed for dissolved cadmium, chromium, mercury, nickel, selenium, or silver during wet or dry weather during this time period.
- Water column toxicity was observed. Inhibited *Ceriodaphnia dubia* survival occurred during the 2002, 2003, and 2005 wet weather events, with 6 of 14 wet weather sampling events and one of 14 dry weather sampling events showing toxicity.
- Diazinon exceeded chronic California Department of Fish and Wildlife freshwater assessment criteria in 5 of 21 samples and acute criteria in 3. No exceedances occurred after 2005, which was following the EPA's de-registration of the pesticide.
- The Torrance Lateral sampling station showed exceedances of acute CTR criteria for dissolved copper (8 of 10) and dissolved zinc (9 of 10) during wet weather conditions in 2008 and 2009. Dissolved lead did not exceed CTR acute criteria in wet weather, and no exceedances of chronic CTR water quality criteria were observed in dry weather samples.
- Exceedances of water quality criteria occurred in the six tributary sampling stations for Ammonia, Cyanide, Dissolved copper, Dissolved lead, Dissolved Oxygen, Dissolved zinc, E. coli, and Fecal coliform.
- During the 2003 SWAMP, the Dominguez Channel samples had high levels of bacteria and pH values exceeding Basin Plan objectives. The estuarine portion of the Channel showed adverse impacts to benthic communities with 3 of 5 stations classified as being in poor condition. For Machado Lake, it was found that the stations at the northern end of the Lake, most likely influenced by Wilmington Drain, had more fine grained sediment, dissolved oxygen below the Basin Plan objective of 5 mg/L, low pH, and high ammonia and nitrate. Chlorophyll-a was highest in the southern end and lowest in the northern end. No acute or chronic toxicity was detected throughout the lake. The station closest to the Wilmington Drain in the north had the highest sediment concentrations of metals. Organic pollutants such as PAHs were highest at the southern stations. Harbor sampling sites had elevated copper and silver concentrations in water samples at all stations and exceedances of silver CTR water quality objectives at six of 30 stations located within both the Inner and Outer Harbor areas. Other metals were well below water quality objectives.
- During various studies of estuary and harbor sediments, exceedances of the Effects Range Medium (ERM) and/or Effects Range Low (ERL) thresholds were observed for DDT, DDD,

DDE, PCBs, chlordane, Dieldrin, metals (arsenic, cadmium, chromium, copper, lead, zinc, mercury, nickel, and silver), and/or PAHs were observed.

- Machado Lake sediment datasets showed sediment concentrations of total chlordane, total DDT and total PCBs above the sediment targets set in the Machado Lake Pesticides and PCBs TMDL. Wilmington Drain sediment data sets showed elevated levels of total DDT, PCBs, and Chlordane.

2.2 Water Body Pollutant Combinations

Using the data analyses and results from additional monitoring reports, WBPCs were classified into one of the three MS4 Permit categories (Category 1-3). Those WBPCs with a TMDL were classified as Category 1, those WBPCs listed on the State's 303(d) list as impairing a particular water body segment were classified as Category 2, and those remaining WBPCs without an associated TMDL or on the State's 303(d) list, but showing exceedances of water quality criteria were classified as Category 3. A summary of these categorizations is presented in Table 2.4. To assist with future prioritization efforts, the categorized WBPCs were divided into the subcategories described in Attachment E. The subcategorized WBPCs for DC WMG, Torrance Lateral, Dominguez Channel Estuary, Machado Lake, Wilmington Drain, the Consolidated Slip, and the rest of the Los Angeles Harbor areas are listed in Attachment E.

Table 2.4: Categorized Water Body-Pollutant Combinations

Water Body	Category 1 (TMDL)	Category 2 (303(d) List)	Category 3 (Other)
Dominguez Channel (lined portion above Vermont Ave)	Copper (diss.), Lead (diss.), Zinc (diss.), Toxicity	Indicator Bacteria, Ammonia, Diazinon	Cadmium(diss.), Chromium (diss.), Mercury (diss.), Thallium (diss.), Bis (2-Ethylhexl) phthalate, pH, Dissolved Oxygen
Torrance Lateral	Copper (diss.), Lead (diss.), Zinc (diss.)	Coliform Bacteria	Cadmium (diss.), Cyanide, pH, Ammonia, PCBs (sed.), DDT (sed.)
Dominguez Estuary (unlined portion below Vermont Ave)	Cadmium (sed.), Copper (diss. and sed.), Lead (diss., sed., & tissue), Zinc (diss. & sed.), DDT (tissue & sed.), PCBs (sed.), Chlordane (tissue & sed.), Dieldrin (tissue & sed.), PAHs (sed.), Benthic Community Effects, Sediment Toxicity	Ammonia, Coliform Bacteria	Arsenic (sed.), Chromium (sed.), Silver (diss. & sed.), Nickel (diss.), Mercury (sed.), Thallium (diss.)
Machado Lake	Trash, Total Phosphorus, Total Nitrogen, Ammonia, Chlorophyll-a, PCBs (sed.), DDT (sed.), Chlordane (sed.), Dieldrin (sed.), Dissolved Oxygen	None	E. coli, pH
Wilmington Drain	None	Coliform Bacteria, Copper (diss.), Lead (diss.)	Total Nitrogen, DDT (sed.), PCBs (sed.), Chlordane, Dieldrin (sed.)
LA Harbor[1] - Cabrillo Marina	DDT (tissue & sed.), PCBs (tissue & sed.), PAHs	None	None

Table 2.4: Categorized Water Body-Pollutant Combinations			
Water Body	**Category 1 (TMDL)**	**Category 2 (303(d) List)**	**Category 3 (Other)**
LA Harbor[1] - Consolidated Slip	Cadmium, Chromium, Copper, Lead, Mercury, Zinc, DDT (tissue & sed.), PCBs (tissue & sed.), PAHs (sed.), Chlordane (tissue & sed.), Dieldrin, Toxaphene (tissue), Benthic Community Effects, Sediment Toxicity	None	Arsenic, Silver, Nickel
LA Harbor[1] - Fish Harbor	Copper, Lead, Mercury, Zinc, DDT (tissue & sed.), PCBs (tissue & sed.), Chlordane, PAHs, Sediment Toxicity	None	None
LA/LB Inner Harbor[1]	Copper, Zinc, DDT (tissue & sed.), PCBs (tissue & sed.), PAHs, Benthic Community Effects, Sediment Toxicity, Indicator Bacteria	None	Copper (diss.), Silver (diss.)
LA/LB Outer Harbor[1]	DDT (tissue & sed.), PCBs (tissue & sed.), Sediment Toxicity	None	Cadmium, Nickel, Silver (diss.), Copper (diss. & sed.), Mercury
LA Harbor[1] - Inner Cabrillo Beach	Indicator Bacteria, DDT (sed. & tissue), PCBs (tissue & sed.)	None	None
Compton Creek [2] (only applies to Carson)	Copper, lead, bacteria, cadmium	Benthic macro-invertebrates,	Chlorpyrifos, chloride, mercury
LA River[2] Reach 1 (only applies to Carson)	Copper, lead, bacteria, cadmium, zinc, nitrate, nitrite, nitrogen	Bis(2-ethlyhexyl)-pthalate, cyanide, pH, mercury, diazinon	Selenium, dissolved oxygen, thallium

1 Los Angeles Harbor metals and organic WBPCs are for sediment unless otherwise noted.

2 These water quality priorities only apply to Carson, and were extracted from the ULAR EWMP (January 2016).

2.3 Source Assessment

The data discussed in Section 2.1 and 2.2 is based on the pollutant sampling data available for the receiving water bodies as presented in Attachment E. The sampling locations were along the channel, tributaries, and at Machado Lake and are shown in Figure 2-1 and Figure 2-2. These were primarily receiving water samples collected at select locations. Outfall sampling, parcel-based, and catch basin monitoring have not been performed in the watershed. As such, the available data does not allow for differentiation among subcatchments in terms sources of pollutants. As part of the source assessment, pollutants were reviewed for each of the Categories 1-3 as well as reviewing the exceedances in each of the water bodies. This is presented in Table 2.1, Table 2.2, Table 2.3, and Table 2.4.

Given the lack of specific sampling that could potentially identify sources, an analysis of land use and expected pollutant loads from those different land uses was conducted. This is generally referred to as the development of a catchment priority index (CPI). The CPI method was employed to assess sources and identify areas where BMP implementation should be prioritized to have the greatest short and long term effects. CPI is a means of ranking sub-watersheds against one another based on relative pollutant loads due to land use to identify the higher priority watersheds. This method was chosen due to the limited data that was available and is based on event mean concentrations (EMCs) developed for different land use types and the areal weighting of different land uses within a given subwatershed. The CPI is purely a land-use and hydrological driven loading analysis, which shows which subcatchments have higher potential loadings. The subwatersheds were ranked against one another to develop a CPI score for each subwatershed. The watersheds with the highest score are considered the highest priorities. This CPI analysis allows one to start from a watershed level and focus on the subcatchments that are likely to be contributing the greatest load of pollutants for BMP implementation and/or monitoring. This is described in detail in Section 2.3.2

2.3.1 Potential Sources of Contamination

In addition to sources of pollution from specific land uses, there are several potential point and nonpoint sources of contamination in the DC WMG. Point sources include stormwater and urban runoff flowing through the MS4 as well as other MS4 discharges, such as those from refineries, generating plants, port operations, and the Terminal Island Water Reclamation Plant that discharges into the Outer Harbor. Major MS4 outfalls are shown in Figure 2-3. Nonpoint sources include contaminated sediments already in receiving waters and atmospheric deposition.

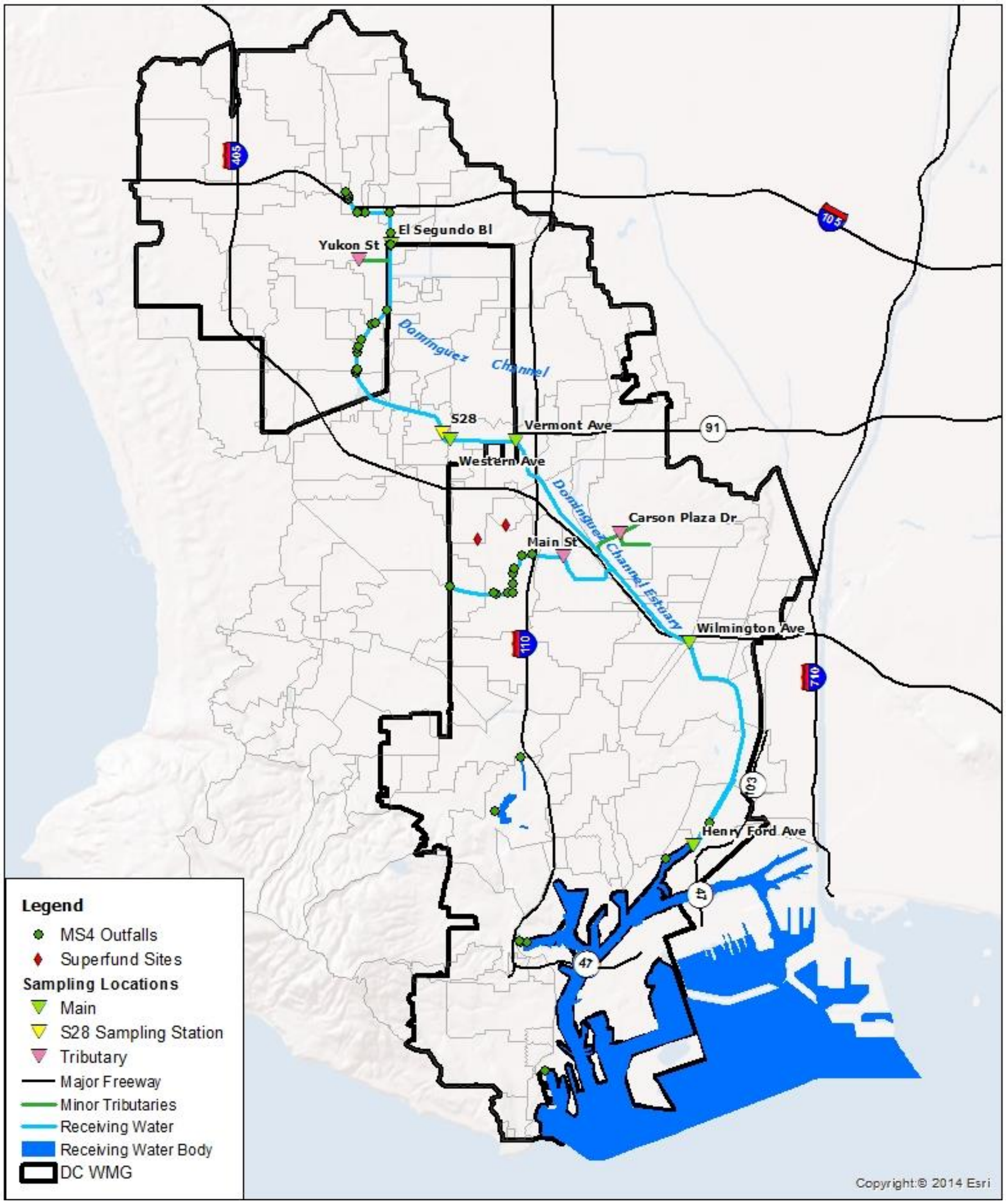

Figure 2-3. MS4 Locations Map

The DC WMG also contains two Superfund Sites that have historically been large contributors of organic pollutants: the Montrose Chemical Corporation Site, and the Del Amo Facility Site. The Montrose site manufactured DDT from 1947 to 1982 and the compound can still be found in the soils around the site. Stormwater runoff from this site, if exposed, can contain DDT from the soils. The site is currently paved with a maintenance plan under an Initial Action taken under USEPA oversight in 1985. The Del Amo Facility was once the center of large-scale production of synthetic rubber, which included a styrene plant and a butadiene plant. Groundwater and soils in the area are contaminated with volatile organic compounds (VOCs), PAHs, and minor amounts of pesticides, PCBs, and heavy metals. Most of the Del Amo facility has been redeveloped into an Industrial park and surficial soils are generally not exposed. The Del Amo pits site, where manufacturing wastes were disposed, was covered with a Resource Conservation Recover Act

(RCRA) equivalent hazardous waste cap in 1999. The two Superfund Sites are located next to each other near the Torrance Lateral as shown Figure 2-3.

2.3.2 Catchment Priority Index

The Los Angeles County-Wide Structural BMP Prioritization Methodology Guidance Manual (see Attachment X) was used to evaluate the land use areas. Method 2 was selected for use as the basis for prioritization. Method 2 uses a methodology of calculating the area-weighted land use within each subcatchment, and based on land-use-specific pollutant EMCs, a concentration-based CPI is calculated. The EMCs used are presented in Table 2.5 below.

Table 2.5. Average EMCs by Land Use for Study Indicator Pollutants*

	Trash	Nitrate	Total Copper	Total Lead	Total Zinc	Fecal Coliform	TSS
Land Use	**cf/ac**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**MPN/100mL**	**mg/L**
Agriculture	0.0	11.3	84.1	20.4	246.6	6,842	699
Commercial/ Educational	1.0	0.46	18.8	2.1	127.5	72,035	58
Industrial/ Transportation/ Other Urban	1.0	0.49	31.6	4.3	289.5	32,679	81
Open	0.0	1.0	3.8	0.01	2.1	255	28
HDSF Residential	1.0	0.30	14.7	5.0	52.6	98,272	65
MF Res/ Mixed Res.	1.0	0.57	12.3	2.5	116.3	98,272	32.6

*Table 3 from the Los Angeles County-Wide Structural BMP Prioritization Methodology Guidance Manual

This method also allows for the normalization between catchments and weighting of pollutants. See Figure 2-4 for the recommended weights and factors per Table 4 from the Los Angeles County-Wide Structural BMP Prioritization Methodology Guidance Manual.

Candidate Catchment Factors	Max Points
1. Rank catchment by pollutant load per unit area (5 bins each)	**50**
Trash	10
Nutrients (Nitrate)	10
Bacteria (Fecal Coliform)	10
Total Metals (Total Cu, Total Pb, Total Zn)	15
Sediment (TSS)	5
2. Multiply pollutant score by 2 if a d/s impairment, by 3 if a d/s TMDL	**x2 or x3**
3. Add 5 points for each "other" impairment (bioaccumulation, toxicity, legacy pesticides, and ecological impacts)	**20**
Theoretical maximum catchment pollutant load score	**170**

Figure 2-4. Recommended Weights and Factors for CPI Calculation

An analysis was performed based on land use areas, associated EMCs (Table 2.5), and weighting factors (Figure 2-4) to develop CPI scores for each subcatchment as shown in Figure 2-5. Within each subcatchment, priority pollutants such as metals (and nutrients in Machado) were weighted the highest.

Additional weight was given to sub-watersheds potentially contributing to water body segments with TMDLs or 303(d) listed impairments for particular pollutants. This was used for establishing where to prioritize BMP placement and maximize potential pollutant reductions throughout the implementation schedule.

The CPI analysis was not available for Carson and Lawndale, but those jurisdictions were analyzed in terms of sources of zinc and bacteria runoff, as described in the next subsection.

Because the DC WMA is fully built-out, highly impervious, and highly industrial, there was not much variation in land uses between subcatchments. Most of the subcatchments have a similar combination of land uses such as commercial, residential, industrial, and some open space. Therefore, the pollutants anticipated in each of the subcatchments were likewise very similar. Because the subcatchments vary in size, the volume associated with runoff in each became the primary differentiator between each subcatchment. The anticipated pollutant loads were affected more by the runoff quantity than any differences in estimated concentrations in runoff. This resulted in the CPI showing the quantity of water to be captured rather than differences in pollutant concentrations. Because of this, source differentiation was not possible with the available data and within the characteristics of the watershed. Reducing load from one subcatchment would have the same overall water quality benefit as reducing load from another subcatchment. The amount of load reduction required varied by subcatchment, but the urgency of load reduction between subcatchments did not vary.

2.3.3 Sources of Zinc and Bacteria Runoff

To support the source assessment, a variety of data sources were reviewed but limited data were available regarding the sources, concentrations or loads of zinc or bacteria (which are limiting pollutants, as described in Section 3). Instead, modeling was used to support the source assessment by analyzing the likely areas where zinc and bacteria runoff[2] are originating within the EWMP area. The methods for baseline modeling are presented in Section 3. The outputs from the source assessment modeling, as shown in Figure 2-6 and Figure 2-7, highlight areas were pollutant load reduction would have the largest benefit. These areas were implicitly emphasized within the RAA process, which includes cost-benefit optimization. Given equal opportunity to implement control measures at equivalent cost, the modeling system prioritizes areas with where the highest load reduction (highest cost-benefit) would occur. In other words, the EWMP Implementation Plan (Section 5) is built upon the source assessment results shown in Figure 2-6 and Figure 2-7.

[2] Bacteria runoff indicates the amount of runoff during the bacteria critical condition (as described in Section 3.4.1). The EWMP manages entirely the runoff from that storm in order to address the Category 2 bacteria WBPCs. As such, it is the runoff volume that drives the EWMP Implementation Plan rather than bacteria loading.

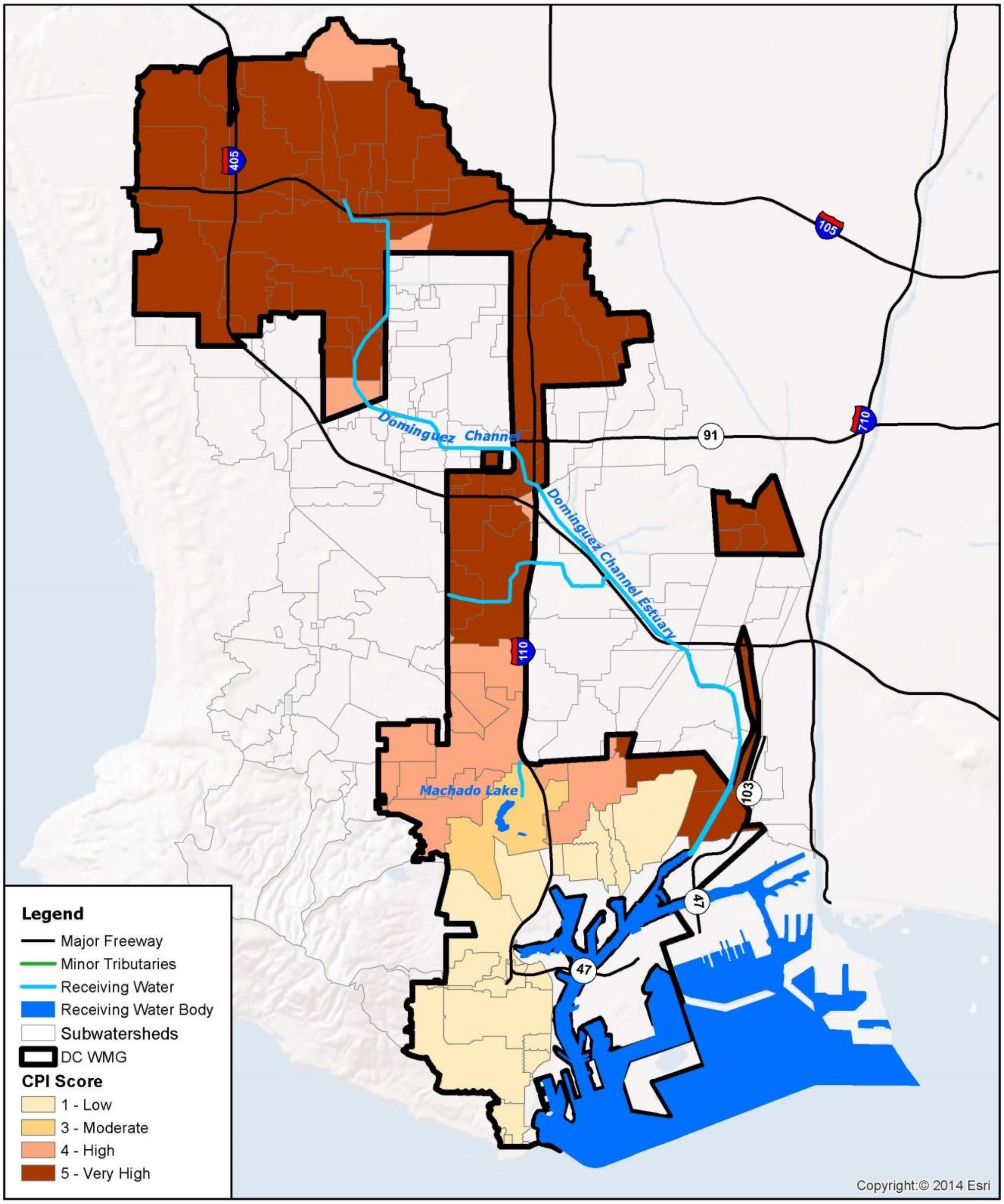

Figure 2-5: Catchment Prioritization Index (CPI) Map[3]

[3] The Cities of Carson and Lawndale were not included within this analysis as those cities were added to the DC EWMP at a later time (August 2015) within the planning process. See Attachments Z and AA for more information on the inclusion of Carson and Lawndale within the DC EWMP.

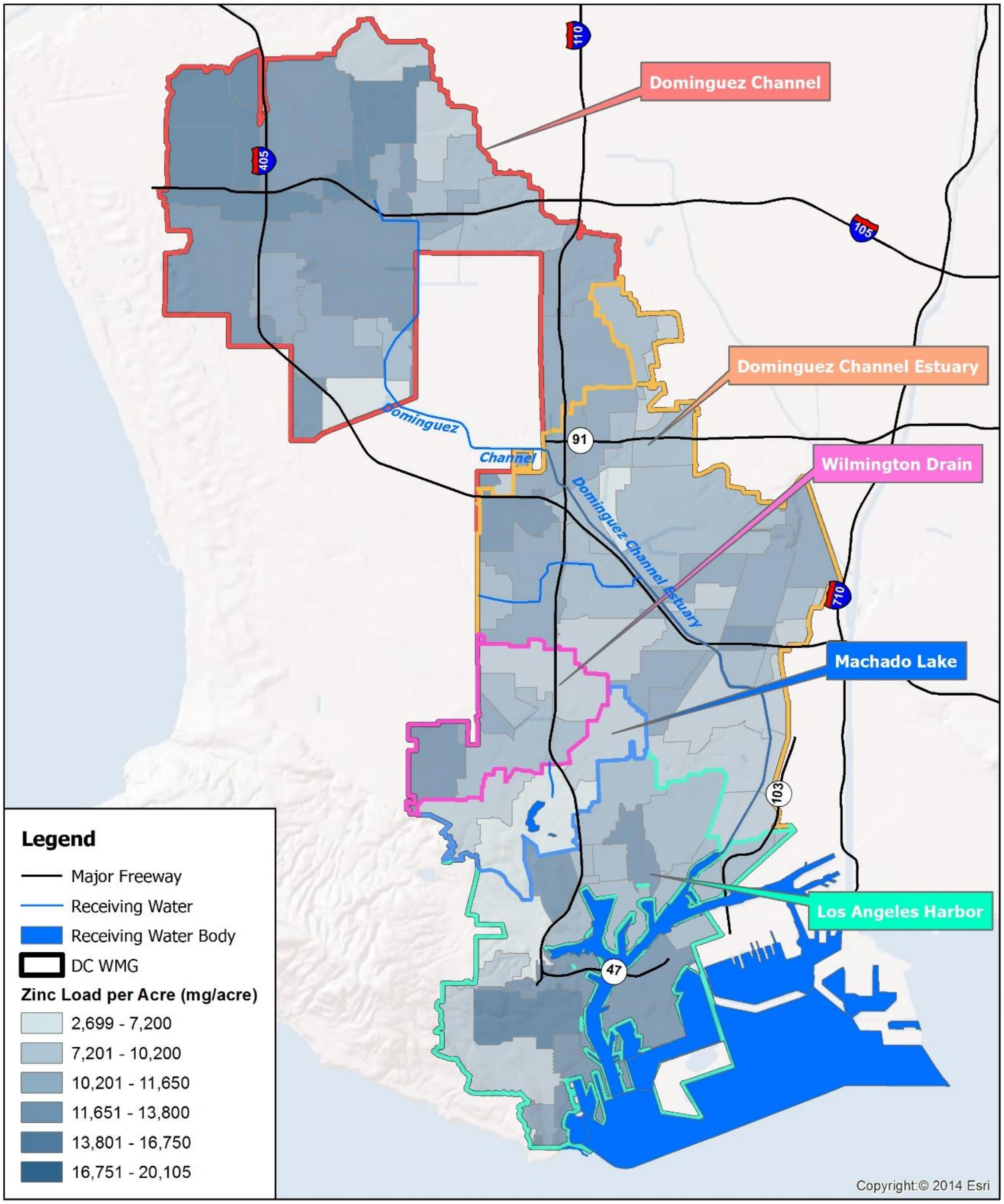

Figure 2-6: Assessment of Sources of Zinc within the DC EWMP Area

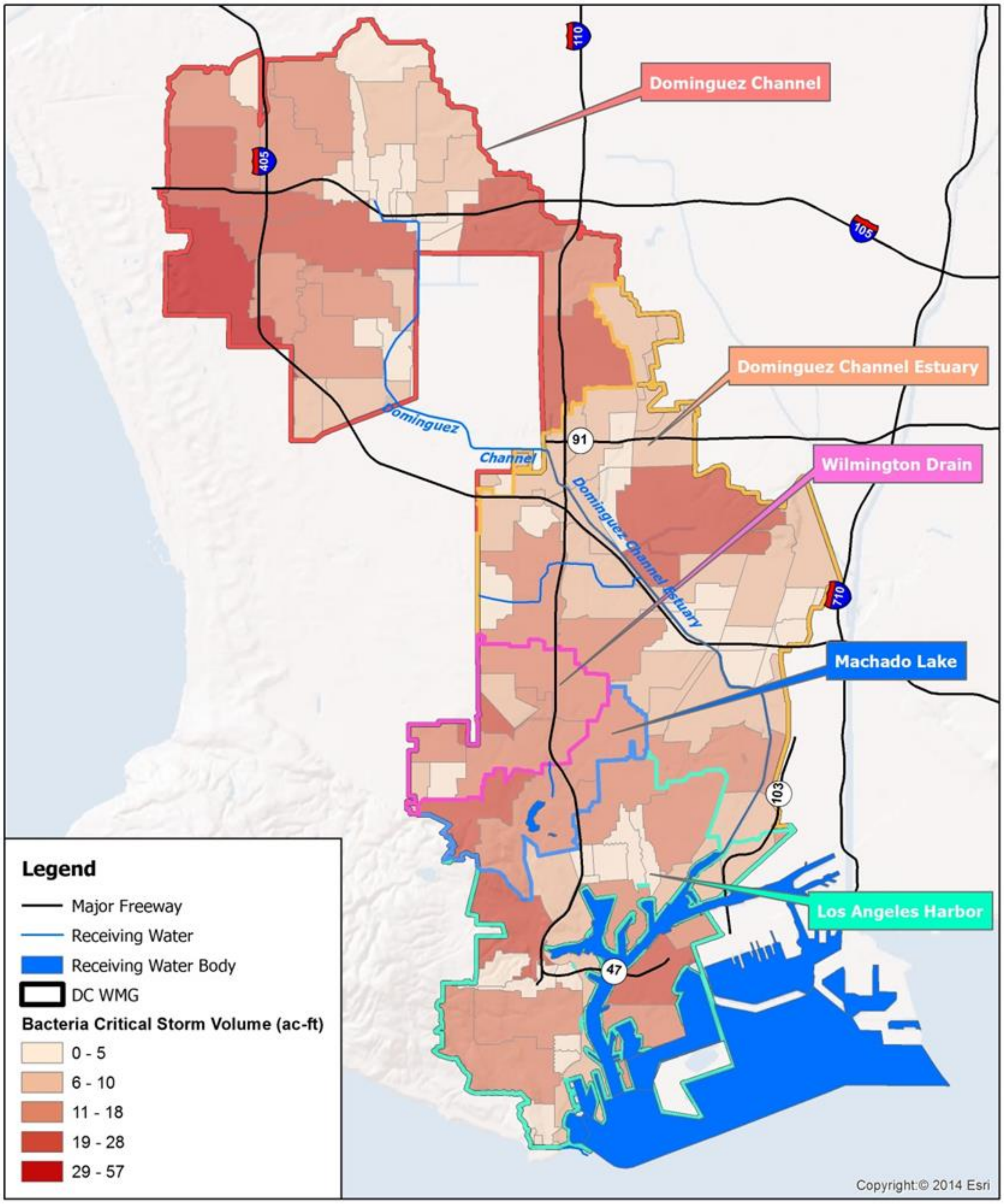

Figure 2-7: Assessment of Sources of Runoff during the Bacteria Critical Condition within the DC EWMP Area

2.4 Approach to Prioritization

To complete an initial prioritization of the WBPCs, pollutants were sub-categorized based on TMDL compliance schedules and exceedance frequencies as outlined in Section 2.2. Those WBPCs that have TMDLs with past due interim and/or final deadlines or with interim and/or final deadlines within the MS4 Permit term will be prioritized higher than those pollutants with TMDL schedules outside the MS4 Permit term. Other receiving water considerations included pollutants on the 303(d) list and WBPCs that show exceedances within the last 5 years.

The water quality issues identified for the Dominguez Channel, Machado Lake, and the LA Harbor are expected to be addressed with the BMPs designed to address existing TMDLs. This is based on chemical similarities between constituents in which their fate and transport would be expected to behave similarly to pollutants addressed by TMDLs.

As previously mentioned, the CPI was attempted for establishing where to prioritize BMP placement in the long range plan to achieve the greatest benefit as soon as possible during the planning horizon. However, this analysis suggests that pollutant concentrations are expected to be consistent between subcatchment and, reducing load from one subcatchment would have similar water quality benefits to reducing loads from other subcatchments. As a result, the assessment of sources of zinc and bacteria runoff (Section 2.3.3) was directly used to prioritize BMP placement and ultimately develop the EWMP Implementation Plan reported in Section 5.

2.5 Compliance Schedule

Compliance schedules with applicable milestones were developed for the receiving water bodies in the DC WMA. Attachment E shows the detailed schedules and Table 2.6, found at the end of this section, presents a simplified final compliance schedule. For constituents addressed by a TMDL (Category 1), the compliance schedules are outlined below. Category 2 (303(d) List) and Category 3 (Other) constituent's loads are expected to be reduced by the BMPs implemented to address TMDLs. If not, those pollutants will be fully addressed by 2040 by additional BMPs to be planned in the 2032 EWMP revision.

Dominguez Channel

The DC/Harbor Toxics TMDL addresses metals, historical organics, and current organics. The DC/Harbor Toxics TMDL contains three implementation phases for the Dominguez Channel, Torrance Lateral, and Dominguez Channel Estuary, and three implementation phases for the Greater Los Angeles and Long Beach Harbor Waters (including Consolidated Slip). The Phases are summarized as follows:

- Phase I: Reduce sediment transport from point sources and implement watershed-wide actions.
- Phase II: Implement additional BMPs and site remedial actions based on the success of upstream source control, evaluation of TMDL monitoring data collected during Phase I, and target point source reduction activities.
- Phase III: Implement secondary and additional remedial actions as necessary to be in compliance with final allocations by the end of the implementation period.

These implementation phases are not assigned interim targets in the DC/Harbor Toxics TMDL, but they do provide implementation milestones that can be attributed to other constituents in a similar class (e.g., metals, historical organics, and current organics) that are not addressed in the TMDL. Phase I will be achieved through enhanced street sweeping, catch basin cleanouts, installation of full capture devices and inspection and enforcement. Through the EWMP process, the DC WMG is working collaboratively and has developed a detailed plan of action to address the TMDL limits. The DC WMG has set numeric milestones in this EWMP based on the amount of water that needs to be captured by EWMP projects. These milestones factor into the time needed to establish a construction program to implement the projects. The DC WMG's planned load reduction milestones are:

- Milestone 1: 50 percent reduction to the receiving water limitation in the constituent for which there is a TMDL compared to a baseline established through the RAA Process in Section 3 by 3/23/2026.
- Milestone 2: 75 percent reduction to the receiving water limitation in the constituent for which there is a TMDL compared to a baseline established through the RAA Process in Section 3 by 3/23/2029
- Milestone 3: Attainment of established receiving water limitations in the constituent which there is a TMDL by 3/23/2032.

Those constituents on the 303(d) list, for which a TMDL has not yet been established, would normally require the development of a TMDL. Because a large portion of the data used for the Water Quality Priorities portion of the EWMP was more than five years old, additional monitoring under the CIMP is recommended as an initial milestone. This will help to assess whether exceedance issues are current and in need of further action or if implementation programs established for DC/Harbor Toxics TMDLs are already addressing the remaining constituents. It is expected that the sediment management measures and BMPs that will be implemented through the DC/Harbor Toxics TMDL will also reduce the remaining constituents. Progress toward reducing exceedances of these constituents can be monitored through the CIMP and will be assessed under the adaptive management framework as outlined in Section 6.

During the development of the DC/Harbor Toxics TMDL, the U.S. EPA found that Diazinon, a constituent currently on the 2010 303(d) list for the Dominguez Channel, was not at levels above water quality benchmarks for this water body. The assessment concluded that the water body was attaining standards for Diazinon and did not require the development of a TMDL for that pollutant. Since its de-registration in 2005, Diazinon levels have decreased in the Dominguez Channel and appear to no longer be the cause of impairment to the water body. Diazinon will continue to be monitored under the CIMP efforts, and monitoring results will be used to evaluate whether specific actions are needed to address this constituent.

The U.S. EPA determined that ammonia levels in the Dominguez Channel and the Dominguez Channel Estuary were meeting water quality objectives (NOAA, 1999). This constituent remains on the 2010 303(d) list for these water bodies, though the State may consider delisting it during the next 305b/303d Integrated Report. For this reason, ammonia remains a water quality priority, but is assumed to be in compliance with water quality objectives. Ammonia will continue to be monitored under the CIMP efforts, and monitoring results will be used to evaluate whether specific actions are needed to address this constituent.

If Category 2 or 3 constituents show ongoing exceedances, an action plan will be developed to identify and mitigate sources of those pollutants within the time frames shown in Attachment E. Progress toward reducing loading of the constituents will be assessed at the end of Milestone 1, and, if necessary, treatment measures for these constituents will be identified.

Machado Lake

Machado Lake will achieve its final trash TMDL deadline of 3/6/2016 through the installation of full capture devices or their equivalent. The Lake will achieve its final nutrient TMDL of 9/11/2018 through the Machado Lake restoration and the replacement of lake water with highly treated water from the Terminal Island Water Reclamation Plant. It will achieve its final toxics TMDL of 9/30/2019 through the Machado Lake and Wilmington Drain restorations, which will remove the residual sediments and associated constituents. Upstream capture devices installed in response to the Trash TMDL and street sweeping activities will reduce discharge of constituents associated with sediments. Monitoring through the CIMP will verify effectiveness. For ongoing nutrient discharges from upstream sources, highly purified water from the Terminal Island Water Reclamation Plant will be used to blend down the nutrient levels to achieve the receiving water limitation in the lakes. Upstream sources will be reduced through the implementation of BMPs associated with achieving receiving water limitations in the Wilmington Drain.

Bacteria is a category 3 pollutant for Machado Lake. Ongoing monitoring through the CIMP will evaluate the frequency and persistence of exceedances. BMPs will be implemented to achieve the water quality criteria by 2040.

Wilmington Drain

No TMDL has been established for the Wilmington Drain, though one for coliform bacteria and one for metals (dissolved copper and dissolved lead) were scheduled to be issued in 2014 and 2019, respectively. During the renegotiation of the Montrose Superfund Site Consent Decree (NOAA, 1999), the U.S. EPA determined that metals in the Wilmington Drain were meeting water quality objectives and that TMDL development was not necessary at that time. Metals remain on the State's 2010 303(d) list for the Wilmington Drain, but may be considered for delisting during the next 305b/303d Integrated Report. Both metals and bacteria will be monitored through the CIMP and will be addressed through TMDL development or in accordance with the approach outlined for constituents not addressed by a TMDL that are not in the same chemical class as those constituents addressed by a TMDL.

Other constituents that showed exceedances of water quality objectives for the Wilmington Drain, but are not on the State's 303(d) list, include total nitrogen and historical organics (DDT, chlordane, Dieldrin, and PCBs).

Because no pollutants in the Wilmington Drain are Category 1, but, instead, are Category 2 and 3, BMPs to achieve water quality objectives for metals and organic toxic pollutants from sources to the Wilmington Drain will be implemented along the same timeframe as those for Machado Lake. If needed, BMPs to achieve water quality criteria for bacteria will be phased in, with ultimate achievement of water quality criteria for bacteria planned in 2040.

An implementation schedule to achieve water quality criteria is provided in Section 5 and explanations of how the schedules were determined are in Section 3.

Los Angeles Harbor Waters

The DC/Harbor Toxics TMDL contains three implementation phases for the Greater Los Angeles and Long Beach Harbor Waters (including Consolidated Slip). The DC WMG has set milestones for achieving load reductions. These implementation phases load reduction milestones are the same as are summarized above for the Dominguez Channel.

The LA Harbor Bacteria TMDL addressed bacteria exceedances in Inner Cabrillo Beach and portions of the Los Angeles Harbor. Monitoring will continue at this site and the Main Ship Channel. The City of Los Angeles has filed a Time Schedule Order for the Inner Cabrillo Beach. Compliance targets have been attained at the Main Ship Channel as there have been zero exceedances at this site.

Table 2.6: DC WMA Receiving Water Bodies Final Compliance Schedule

Water Body	**Category 1 (TMDL)**			**Category 2 (303(d) List)**	**Category 3 (Other)**
	50%	75%	100%	100%	100%
Dominguez Channel (lined portion above Vermont Ave)	2026	2029	2032	2040[2]	2032[3]
Torrance Lateral	2026	2029	2032	2040[2]	2032[3]

Table 2.6: DC WMA Receiving Water Bodies Final Compliance Schedule					
Water Body	**Category 1 (TMDL)**			**Category 2 (303(d) List)**	**Category 3 (Other)**
	50%	75%	100%	100%	100%
Dominguez Estuary (unlined portion below Vermont Ave)	2026	2029	2032	2040[2]	2032[3]
Machado Lake	2019[1]	2019[1]	2019[1]	None	2040[2]
Wilmington Drain	None	None	None	2040[2]	None
LA Harbor - Cabrillo Marina	2026	2029	2032	None	None
LA Harbor - Consolidated Slip	2026	2029	2032	None	2032[3]
LA Harbor -Fish Harbor	2026	2029	2032	None	None
LA/LB Inner Harbor	2026	2029	2032	None	2032[3]
LA/LB Outer Harbor	2026	2029	2032	None	2032[3]
LA Harbor - Inner Cabrillo Beach	2026	2029	2032	None	None

[1] Machado Lake is 2016 for trash, 2018 for nutrients, and 2019 for toxics.

[2] Addresses "Bacteria" pollutant class (Attachment E). Assumes a 25-year period for final compliance consistent with the Los Angeles River Watershed Bacteria TMDL.

[3] Addresses "Metals" pollutant class (Attachment E). Final compliance consistent with the DC/Harbor Toxics TMDL.

3. Reasonable Assurance Analysis Approach

As specified in Part VI.C.1.g of the MS4 Permit, an EWMP comprehensively evaluates the opportunities that, wherever feasible, retain all non-stormwater, such as overflow irrigation, and stormwater runoff from the 85th percentile, 24-hour storm event from the tributary watershed. These projects are also referred to as regional EWMP projects. Areas that drain to regional EWMP projects are considered in compliance with all water quality standards. For the remaining areas, an RAA must be conducted to demonstrate that selected BMPs provide reasonable assurance that applicable WQBELs and RWLs will be attained.

This section explains the methodology of the RAA for the DC WMG EWMP. The RAA developed by the DC WMG is in conformance with the RAA Guidelines developed by the Regional Board.

Attachment F discusses in detail the model setup, calibration, and validation process associated with stormwater flow through the system and the corresponding water quality. The incremental approach for demonstrating compliance with MS4 Permit requirements is also discussed and includes the implementation of modified MCMs, industrial and other permitted sites, regional BMP projects, and green streets. A cost estimate and schedule for implementation have been developed for inclusion in the EWMP based on the RAA and are provided in later sections of this document. Attachment Y has additional information for the RAA including calibration metrics and validation using a representative system.

The purpose of the RAA is to demonstrate that the implementation scenarios proposed in the EWMP will meet the applicable WQBELs and RWLs within the DC WMG. This is done by demonstrating load reductions for the 85th percentile 24-hour storm and the 90th percentile load. Typically, the 85th percentile, 24-hour storm event volume is addressed by regional projects. The 90th percentile load criteria was used to propose other control measures, as addressing the 90th percentile load provides reasonable assurance with meeting water quality objectives. Capture of the 90th percentile 24-hour load and volume provides a high threshold for constituent loads to not escape the BMPs. More detail is provided in the following sections on selection of the appropriate storm/load for this criterion and the expected load reductions and constituent concentrations after the BMPs associated with this criterion are implemented. In many cases, 90th percentile loads with similar volumes to the 85th percentile 24-hour storm volume provide a double assurance that loads will meet MS4 permit requirements and water quality objectives.

This section highlights key components of the RAA, as follows:

- Overview of modeling system (3.1)
- Baseline watershed model development and calibration (3.2)
- Dry weather RAA approach (3.3)
- Wet weather RAA approach (3.4)

3.1 Modeling System

The RAA for the DC WMG was conducted using the BMP modeling system Watershed Management Modeling System (WMMS). WMMS is included in the list of approved watershed models for conducting a RAA outlined in Part VI.C.5.b.iv.(5) of the MS4 Permit. WMMS is a regional model developed by the LACFCD and is comprised of three main components:

1. A watershed model for prediction of baseline hydrology and pollutant loading (Loading Simulation Program – C+ [LSPC]);
2. A model for simulating the performance of control measures in terms of flow, concentration and load reduction (System for Urban Stormwater Treatment Analysis and Integration [SUSTAIN]); and

3. A tool for running millions of potential scenarios and optimizing/selecting control measures based on cost-effectiveness (also within SUSTAIN).

LSPC was developed from the Hydrologic Simulation Program - FORTRAN (HSPF) used for simulating hydrology, sediment, and general water quality. The model generates runoff based on rainfall, snow, and groundwater inputs, estimates pollutant loading and transport based on point source data, aerial deposition, and non-point source loadings, estimates chemical and transport interactions within stream reaches, and can provide water quality data based on the interactions for specified locations.

SUSTAIN was developed by USEPA to support practitioners in developing cost-effective management plans for municipal stormwater programs and evaluating and selecting BMPs to achieve water quality goals. SUSTAIN was specifically developed as a decision-support system for selection and placement of BMPs at strategic locations in urban watersheds. It includes a process-based continuous simulation BMP module for representing flow and pollutant transport routing through various types of structural BMPs. This simulation provides the *primary application* of SUSTAIN – simulating the performance of selected stormwater control measures.

The *secondary application* of SUSTAIN is BMP selection, which is based on cost-benefit of different BMP alternatives. The SUSTAIN model in WMMS includes a cost database comprised of typical BMP cost data from a number of published sources including BMPs constructed and maintained in Los Angeles County (LACDPW 2010a, 2010b). SUSTAIN considers certain BMP properties as "decision variables," meaning they are allowed to vary within a given range during model simulation to support BMP selection and placement optimization. As BMP sizes and locations change, so do cost and performance. SUSTAIN runs iteratively to generate a cost-effectiveness curve comprised of millions of BMP scenarios (e.g., the model was used for the EWMP to evaluate the different combinations of green infrastructure as compared to regional BMPs, and provides a recommendation on the most cost-effective scenario)

Additional information regarding WMMS is available from the Los Angeles County Department of Public Works (LACDPW) (2008, 2010a, 2010b, 2010c, 2011, 2013). The documents can be found on the WMMS homepage (http://dpw.lacounty.gov/wmd/wmms/) where it can also be downloaded. Information pertaining to LSPC is available from the United States Environmental Protection Agency (USEPA, 2003). Information pertaining to SUSTAIN is also available from USEPA (http://www2.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain).

3.2 Baseline Watershed Model Development and Calibration

The objective of baseline watershed model calibration is to develop a watershed model that is representative of receiving water hydrology and water quality in the Dominguez Channel WMA. A baseline analysis was performed which represents the current watershed condition based on existing stormwater programs. Stormwater runoff was simulated based on the time series record of rainfall between October 2002 and September 2012. This period represents the most recent 10 years of record as required by the MS4 Permit. There are 130 subwatersheds in the Dominguez Channel and Estuary Watershed portion of the WMMS model (Figure 3-1), which includes all areas within the Dominguez Channel WMA.

As part of the baseline analysis, the industrial permitted and other permitted facilities were identified. These facilities are modeled as compliant, meaning the parcels did not contribute to the flow, volume, or constituent loading, as they are covered under other stormwater permits. These facilities are illustrated in Figure 3-2 and listed in Attachment G and Attachment H.

In addition to the structural control measures to retain runoff, the EWMP also includes actions in Machado Lake that are anticipated to address nutrient TMDL requirements (Section 2.5). As such, the control measures in the portions of the watershed that drain to Wilmington Drain and Machado Lake are driven by control of bacteria.

Given that the instream flow gage is the point of reference for model calibration, establishing a baseline model focuses on identifying features and processes that occur between the point where runoff originates and the gage where flow and water quality are measured. The Dominguez Channel portion of the *original* WMMS model was uncalibrated because flow and water quality data were either not available or not accessible when WMMS was originally developed. As such, the WMMS model was updated in order to improve the calibration. The calibration primarily relied upon flow and water quality monitoring data provided by the LACFCD from the S28 mass emission station on Dominguez Channel at Artesia Blvd. S28 is in the freshwater portion of Dominguez Channel, upstream of the tidally-influenced reaches of channel. Calibration metrics are presented in Attachment F. Additional baseline calibration information requested by the Regional Board including direct comparisons to the Regional Board Guideline metrics are presented in Attachment Y[4].

[4] In the June 2015 draft EWMP, many of the calibration details were in both the main body of this EWMP and Attachment F. For the February 2016 revision, the calibration details were limited to Attachment F (and not repeated here in the main body).

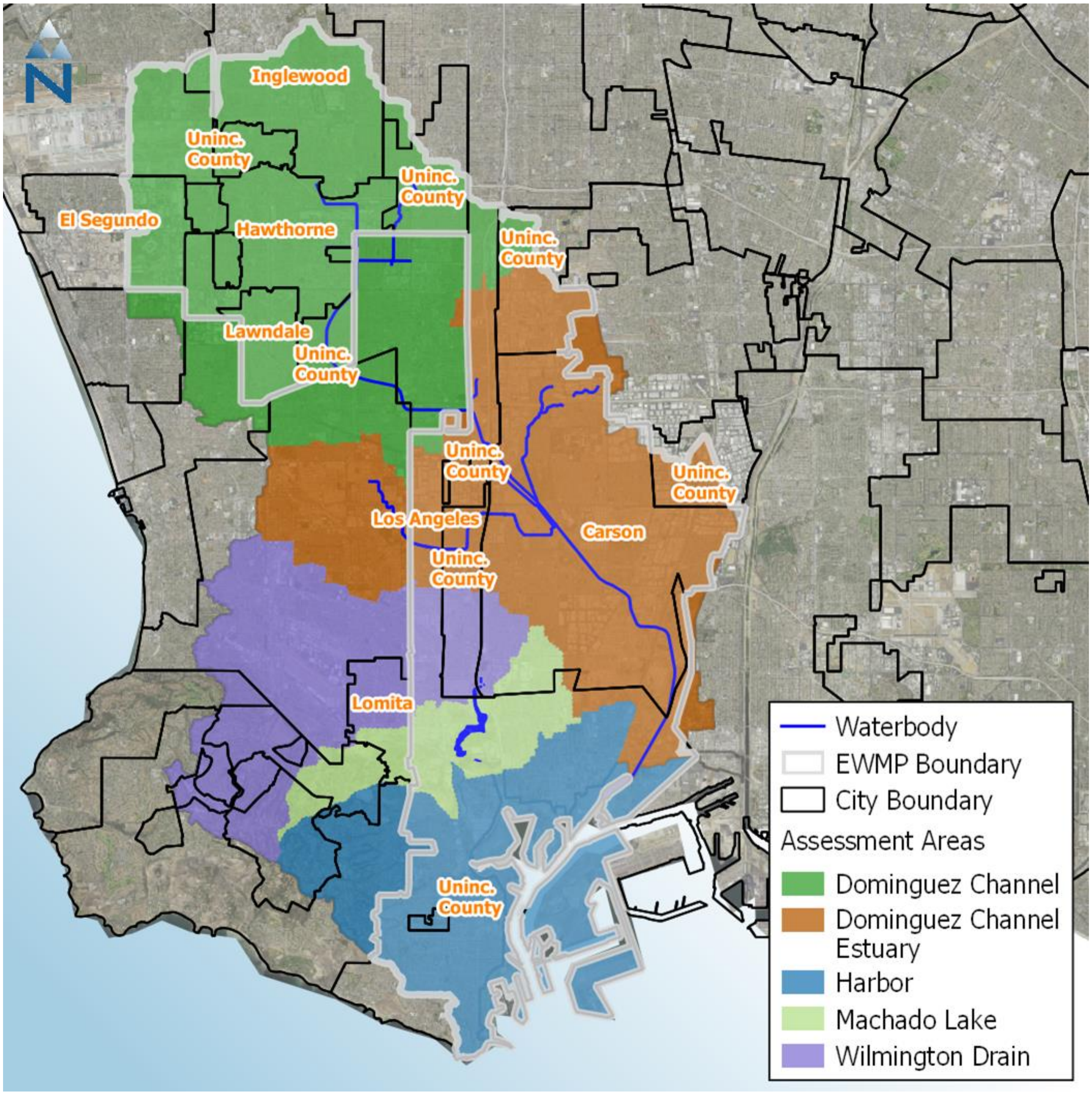

Figure 3-1: Major Watershed Assessment Areas in the DC EWMP

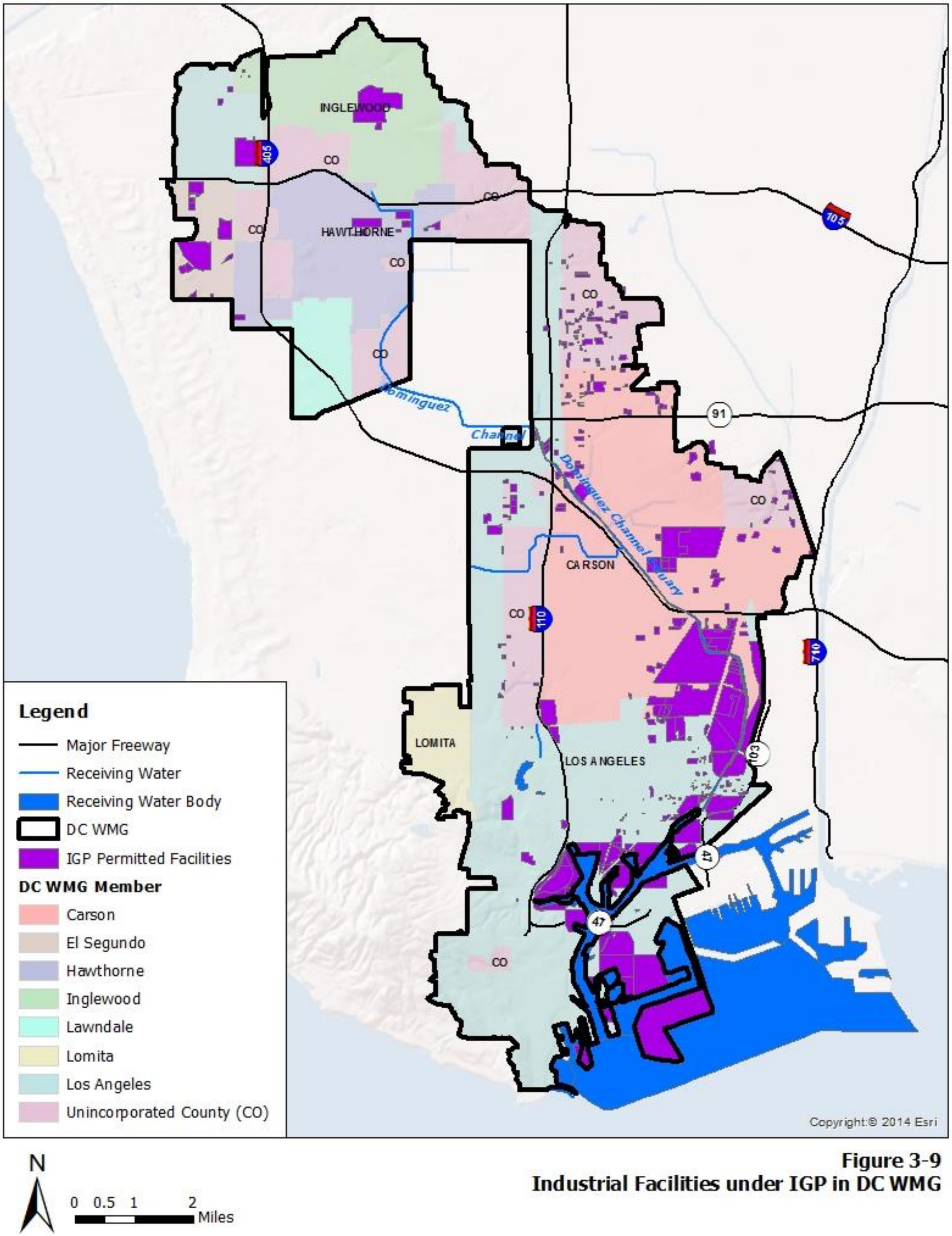

Figure 3-2: Industrial Facilities under IGP in DC WMG

3.3 Dry-Weather RAA Approach

The approach to the dry-weather portion of the DC WMG RAA was to evaluate the volume and sediment reduction potential provided by proposed regional and distributed BMP projects to estimate how much of the dry-weather flows would be addressed. This approach does not include the use of a hydrologic predictive model due to data set limitations and significant spatial variation throughout the DC WMG for dry-weather flows. Estimated daily yields were derived from local dry-weather flow monitoring data collected at the existing Mass Emissions site (MES) S28 (illustrated in Figure 2-1:) and is summarized in Table 3.1. The monitoring data collected at S28 was analyzed to determine an average discharge per acre ratio per month for the period of analysis (2002-2012). The resulting monthly averages were then applied to the DC WMG area to identify the volume per day generated within the group area. The flows presented in the table represent existing conditions and do not take into account the control measures proposed in this EWMP.

Table 3.1: Average Monthly Dry-Weather Flow in DC WMG

Month	Average Flow (cfs)/Acre	DC WMG Volume per Day (acre-feet/day)
January	0.00026	19.41
February	0.00032	23.89
March	0.00033	24.64
April	0.00035	26.13
May	0.00025	18.66
June	0.00041	30.61
July	0.00030	22.4
August	0.00024	17.92
September	0.00022	16.42
October	0.00027	20.16
November	0.00020	14.93
December	0.00022	16.42

Flows captured through regional BMP implementation were subtracted from the total assumed non-stormwater flows (presented in Table 3.1) to quantify pollutant load reductions. The BMPs used for this analysis are discussed further in Section 4. Based on the volume of storage provided by the proposed regional BMPs, the dry-weather flows will be eliminated, as encouraged by the MS4 Permit. The volume provided by the proposed control measures is significantly greater than the volume of dry-weather runoff produced within the DC WMG.

3.4 Wet-Weather RAA Approach

The wet-weather RAA approach allowed for estimating the level of BMP implementation needed to meet applicable WQBELs and RWLs. This approach incorporated pollutant prioritization and structural BMP implementation scenarios, while considering stakeholder input through a transparent process.

The wet-weather RAA approach involved the estimation of both the existing pollutant loads (baseline) and target load reductions as a percent reduction of the total load. WMMS provided optimized load reduction targets, recommended distribution of BMPs, and cost estimates.

Once the baseline conditions were estimated, watershed control measures were selected and modeled to be implemented to meet applicable WQBELs and RWLs. The selected control measures, such as regional BMP projects, distributed BMPs (green streets), and MCMs, were then modeled at various milestones within the implementation time frame to estimate the quantity, location, and timing of BMP implementation to meet the interim and final WLAs applicable to the DC WMG.

3.4.1 Baseline Critical Conditions and Required Pollutant Reductions

The critical condition for the DC EWMP is the storm that produces the 90th percentile pollutant load [5]. The RAA and EWMP Implementation Plan are based on achieving required pollutant load reduction to attain the water quality targets during that critical condition. The baseline 90th percentile loading for the limiting pollutants for each assessment area was determined along with the required reductions to achieve the corresponding water quality targets. As described in Section 3.4.2, the limiting pollutants are zinc and bacteria for all assessment areas in the watershed, except for Machado Lake and Wilmington Drain where bacteria is the limiting pollutant. The wet weather RAA is based on achieving the required zinc and/or bacteria reductions during critical storm conditions.

In accordance with the RAA Guidelines, the interim required reductions are based on the average storm while the final required reductions are based on the 90th percentile storm event. Shown in Table 3.2 are the percentile zinc loads for each assessment area in the DC EWMP including the 90th percentile loading event. Shown in Table 3.3 are the calculated required pollutant reductions for interim and final compliance. The ratio of average to 90th percentile loading (also shown in Table 3.3) is used to phase from interim to final compliance over the course of the EWMP implementation schedule.

For bacteria (*E. coli*), rather than rely on load reduction, the RAA is based on full retention of the runoff from the 90th percentile "critical bacteria storm." The critical bacteria storm is the 90th percentile annual bacteria storm that is not subject to the High Flow Suspension or annual allowable exceedance days. The 90th percentile critical bacteria storm accounts for allowable exceedance days and the High Flow Suspension, using the MS4 wasteload allocations from the LA River Bacteria TMDL as a template. The LA River Bacteria TMDL includes 10 allowable exceedance days in addition to High Flow Suspension days. The approach to identifying and simulating the critical bacteria storm for the DC EWMP is identical to the Upper Los Angeles River, Ballona Creek, Upper San Gabriel River and Upper Santa Clara River EWMPs.

Table 3.2: Total Zinc Loading Statistics by Watershed Area (pounds during critical 24-hour storm)

Percentile Loading Event	Dominguez Channel	Dominguez Channel Estuary	Machado Lake	Wilmington Drain	L.A. Harbor
Average	182.34	319.8	97.474	72.665	57.5
10th	0	0.511	0	0	0
20th	0.2	8.5	0.103	0.01	0
30th	2.9	22.89	1.952	0.552	1.3
40th	11.3	42.5	7.065	2.528	5.1
50th	29.8	75.2	15.895	6.733	10.8
60th	63.3	127.4	32.647	16.93	20.7
70th	129.8	232.8	72.163	44.012	39.8

[5] The DC EWMP uses the storm that produces the 90th percentile zinc load as the critical storm condition. Some of the EWMPs in nearby watersheds used the storm that produced the 90th percentile "Exceedance Volume" as the critical storm condition. Both of these approaches are consistent with RAA Guidelines.

Table 3.2: Total Zinc Loading Statistics by Watershed Area (pounds during critical 24-hour storm)					
Percentile Loading Event	**Dominguez Channel**	**Dominguez Channel Estuary**	**Machado Lake**	**Wilmington Drain**	**L.A. Harbor**
80th	288.1	464.9	146.679	94.942	83.5
90th	625.7	1051.4	299.524	225.579	174.9

Table 3.3: Critical Conditions and Required Reduction by Watershed Area						
Jurisdiction	**Reduction Metric**	**Dominguez Channel Estuary**	**Dominguez Channel**	**L.A. Harbor**	**Machado Lake**	**Wilmington Drain**
Final Compliance with Metals and Other Water Quality Priorities (except *E. coli*)	Required Load Reduction	86.2% zinc reduction	86% zinc reduction	84.1% zinc reduction	Runoff from critical bacteria storm is retained prior to discharge to receiving water	
	Allowable load during 90th percentile/final condition (pounds)	145.1 pounds of zinc	87.6 pounds of zinc	27.8 pounds of zinc		
	Loading during 90th percentile/final condition (pounds) [3]	1,051.4 pounds of zinc	625.7 pounds of zinc	174.9 pounds of zinc		
Interim Compliance with Metals and Other Water Quality Priorities (except *E. coli*)	Loading during average/interim condition (pounds) [4]	319.8 pounds of zinc	182.3 pounds of zinc	57.5 pounds of zinc		
	Ratio used to gradually phase from interim to final reduction (Average:90th Percentile)	0.30	0.29	0.30		
Final Compliance with *E. coli*	Runoff volume to be retained [5]	Runoff from critical bacteria storm is retained prior to discharge to receiving water				

1 – Based on control of zinc (Dominguez Channel Estuary) during storm that generates the 90th percentile load for the respective pollutant
2 – For Dominguez Channel Estuary, the total zinc target was set to 95.14 ug/L, which is the CTR criteria for saltwater
3 – Loading of zinc at mouth of watershed from storm that generates the 90th percentile zinc load
4 – Loading of zinc at mouth of watershed from storm that generates the average zinc load
5 – Critical bacteria storm methodology is consistent with the Upper Los Angeles River EWMP (ULAR Group 2015)

3.4.2 Limiting Pollutant Evaluation

The limiting pollutant concept simplifies the RAA through the following assumption: if the pollutants that require the largest treatment capacity to meet WQBELs and RWLs are managed, all other constituents will also be addressed. Meeting all of the WQBELs and RWLs in the DC WMG can be achieved through control of the limiting pollutants. The limiting pollutants drive the implementation actions and dictate the stormwater volumes the control measures must manage. A detailed limiting pollutant evaluation was conducted for the DC RAA, as detailed in Attachment F. The results highlight zinc and bacteria as the limiting pollutants that drive the capacity of BMPs in the EWMP Implementation Plan. That conclusion is consistent with the results of other RAAs that used WMMS to conduct RAAs. The limiting pollutants are as follows:

- **Limiting pollutant #1 – zinc:** in nearly all urbanized watersheds evaluated across LA County, zinc is a limiting pollutant[6]. For the DC EWMP, zinc is a Category 1 WBPC in all watershed areas except Wilmington Drain and Machado Lake. As such, zinc is defined as a limiting pollutant in the Dominguez Channel, Dominguez Channel Estuary and LA Harbor. Zinc is the primary pollutant by which load reduction for the Harbor Toxics TMDL will be achieved.

- **Limiting pollutant #2 – *E. coli*:** *E. coli* is a limiting pollutant throughout LA County, and is a Category 2 or 3 WBPC in all DC watershed areas. As such, E. coli is defined as a limiting pollutant in Dominguez Channel, Dominguez Channel Estuary, LA Harbor, Wilmington Drain and Machado Lake.

For watershed areas where the above limiting pollutants are applicable, the RAA was primarily based on controlling the pollutant(s). If both limiting pollutants applied (Dominguez Channel, Dominguez Channel Estuary and LA Harbor), then the control measures were first sized to achieve the required zinc reductions, and then additional BMP capacity was added, if necessary, to manage the critical bacteria storm. For the Machado Lake and Wilmington Drain watershed area, the BMPs were sized to manage the critical bacteria storm.

When defining a limiting pollutant, the implementation actions are a consideration. For the DC EWMP, copper and nutrients were evaluated but not considered candidates for limiting pollutants due to ongoing or future implementation actions that will address impairments, as follows:

- Copper loads are expected to reduce over fifty percent due to SB 346; therefore zinc was chosen as the limiting pollutant. SB 346 requires incremental reductions in the amount of copper in vehicle brake pads. SB 346 requires most brake pads sold in California to contain less than five percent copper by weight after January 1, 2021.

- For Machado Lake, nitrogen is expected to be addressed through the Machado Lake Ecosystem Rehabilitation Project. The City of Los Angeles is leading the project and construction will be completed in April 2017. The project includes dredging the lake to remove accumulated sediments and constructing a pipeline that will discharge highly treated recycled water into the lake to offset evapotranspiration at a cost over $100 million. The treated water that will be added to the lake will dilute the stormwater stored in the lake and lower the concentration of all pollutants, including nutrients (nitrogen) and toxics. If necessary, the entire volume of water in the lake could be replaced with the reclaimed water within 30 days to meet the TMDL requirements for nutrients. Replacement would result in dilution of water with elevated levels of constituents with treated water.

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[6] See the limiting pollutant analyses in approved WMPs for Lower Los Angeles River, Los Cerritos Channel, and Lower San Gabriel River, and the City of Long Beach, which address metals TMDLs and the DC/Harbor Toxics TMDL. The EWMPs for Upper LA River, Ballona Creek, and Upper San Gabriel River address similar pollutants. All of these watersheds contain highly urbanized areas like the DC watershed, and zinc is a limiting pollutant where metals TMDLs and/or the DC/Harbor Toxics TMDL apply.

The City of Los Angeles (2014) also performed modeling analysis of the lake to estimate the water quality benefits with in-lake BMPs implemented. However, this modeling was limited to simulating a subset of the BMPs to be implemented, due to data limitations to represent BMP performance. The in-lake BMPs modeled included lake dredging, addition of supplemental recycled water, an in-lake oxygenation system, a phosphorus removal system, and an off-line treatment wetland. Within one year of implementation of these BMPs, mean summer in-lake concentrations of total phosphorus and total nitrogen are predicted to reduce to 0.12 (85% reduction) and 1.19 mg/L (34% reduction), respectively. However, this prediction does not account for additional BMPs that could not be modeled, including aquatic plant management and littoral zone enhancements, shoreline erosion control (lake edge) treatments, public education and outreach, and others. These additional BMPs are expected to further reduce nutrient concentrations within the lake (2.5% reduction of total phosphorus; 11% reduction of total nitrogen) to meet TMDL targets, which will be further assessed through the adaptive management process. Similar modeling was performed for toxic pollutant concentrations (chlordane, DDT, dieldrin, and PCBs) in the lake water column and sediments, which also predicted reductions to meet their respective TMDL targets with the in-lake BMPs.

During adaptive management, CIMP monitoring data will be used to evaluate whether additional pollutants should be considering limiting pollutants, and the EWMP will be updated as appropriate.

3.4.3 Representation of EWMP Control Measures

The representation of control measures in the model is an important element of the RAA, as it provides the link between future watershed activities, model-predicted water quality improvement and ultimately, compliance. By applying SUSTAIN, the EWMP Implementation Plan for the DC EWMP is able to benefit from optimization, which helps to increase the cost efficiency of the BMP network. The design assumptions in Table 3.4 were used within the SUSTAIN model to represent BMPs and their performance.

Table 3.4: Summary of EWMP control measure opportunities included in RAA			
BMP Category	**Sub-Type**	**Description of BMP Program**	**RAA Assumptions regarding BMP Design Parameters**
Institutional	MCMs and/or Enhanced MCMs	For 5% reduction: implement new MCMs in 2012 Permit. For the additional 5% reduction, see institutional control measures in Section 4.1.[1]	None, not modeled explicitly.
LID	LID Ordinance (New/ Redevelopment)	BMP implementation assumed to equal redevelopment growth rates reported by Los Angeles Bureau of Sanitation (see Table 4.5). Each agency will track redevelopment and verify that that LID is implemented at projected rate, based on capacities and schedules in Section 5.	Bioretention/Biofiltration sized to capture 85th percentile runoff from parcel. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.
Green Streets	Green Streets	Implement green street projects according to the specified capacities and schedule in Section 5.	Bioretention/biofiltration is 4-ft wide. Permeable pavement/subsurface storage is 5-ft wide and used in tandem with bioretention/biofiltration. 50% of street length retrofittable. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.
Regional	Regional BMPs (identified / signature projects)	Implement regional projects according to the specified capacities in Section 5. Details of the project design are presented in Section 4.2.4.1.	BMP footprint delineated and depth specified based on site configuration, topography, depth to groundwater, and other infrastructure. See Section 4.2.4.1 for project details.
	Additional BMPs (TBD)	Implement undetermined stormwater capture projects, if necessary, according to the specified capacities in Section 5. During adaptive management, each agency will strive to find additional opportunities for BMPs on public land to avoid this category of BMP / land acquisition[2].	Assumed 3-ft-deep infiltration basin at subwatershed outlets. Maximum footprint = 5% of contributing area.

[1] All Group members except City of Los Angeles identify institutional control measures to achieve a total of 10% reduction.

[2] For example, the City of Carson is discussing leasing a parcel adjacent to the Carriage Crest Park site from the Los Angeles County Sanitation District, which could allow the Carriage Crest project to be expanded in a future phase to capture additional runoff/drainage area.

3.4.4 BMP Selection for EWMP Implementation Plan

The RAA process is an important tool for assisting EWMP agencies with selection of control measures for the EWMP Implementation Plan. A major challenge associated with stormwater planning is the multitude of potential types and locations of control measures and the varying performance and cost of each scenario. The SUSTAIN model within WMMS provides a powerful tool for considering millions of scenarios of control measures and recommending a solution based on cost-effectiveness.

3.4.4.1. Selection of Control Measures for Final Wet Weather Compliance

The RAA process first determined the control measures to achieve the required load reductions under critical zinc conditions and then determined the additional capacity (if any) to retain the critical bacteria storm. The optimization modeling is conducted stepwise to determine the control measures for final compliance that are selected for the EWMP Implementation Plan, as follows:

1. Determine the cost-effective BMP solutions for each subwatershed in the EWMP area: an example set of "BMP solutions" is shown in Figure 3-3 3-3, which shows millions of scenarios considered for an individual subwatershed in the EWMP area. Notice the different scales for each assessment area (most BMP capacity is in Dominguez Estuary). The scenarios are based on the available opportunity (e.g., the available footprints for regional BMPs and length of right-of-way for green streets) and predicted performance for controlling zinc (or, for Wilmington Drain, bacteria) if BMPs were implemented at those opportunities with varying sizes. The most cost-effective BMP solutions for each of the subwatersheds in each jurisdiction provide the basis for cost optimization.

2. By rolling up the most cost-effective BMP solutions at the subwatershed level, the most cost-effective EWMP Implementation Plan can be estimated. The combined "cost- optimization curves" for the subwatersheds becomes the overall cost optimization curves for each jurisdiction. The optimized point on each curve includes a "recipe for compliance" for all the subwatersheds within that assessment area.

3. Extract the cost-effective scenarios for the required reduction: the required zinc reductions specified in Table 3.3, determine the specific scenario that is selected from the cost optimization curves. Each jurisdiction within an assessment area is held to the same percent reduction as other jurisdictions contributing to the same watershed area. The selected scenarios become the EWMP Implementation Plan. The extracted control measures comprise a detailed recipe for compliance with RWLs for metals and other Water Quality Priorities for each subwatershed in the jurisdictional area.

4. Route the critical bacteria storm through the control measures in the extracted scenario: the effectiveness of the selected control measures for retaining the critical bacteria storm is evaluated. The additional capacity (if any) to retain the critical bacteria storm is determined for each subwatershed. That additional capacity is prescribed as Additional BMPs.

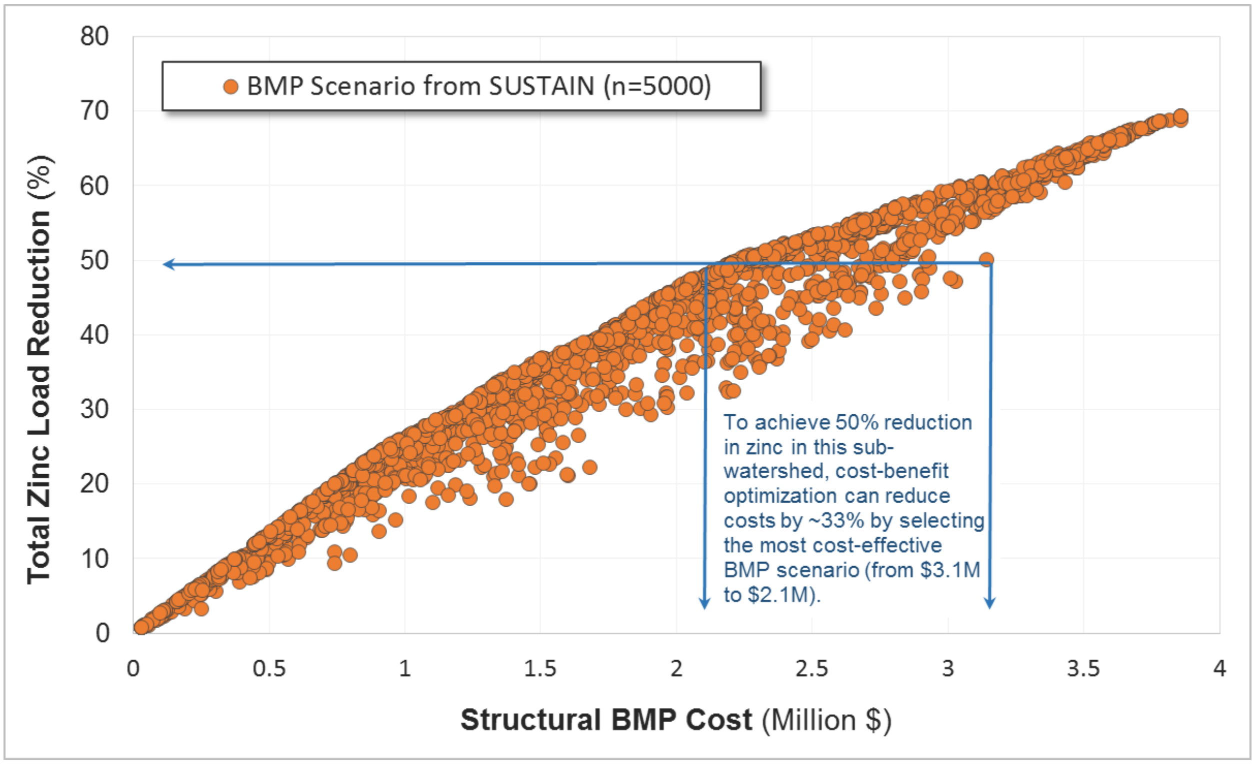


Figure 3-3. Example BMP solutions for a selected subwatershed and advantage of cost-benefit optimization.

3.4.4.2. Selection of Control Measures for Interim Wet Weather Compliance

With the EWMP Implementation Plan determined to meet final milestones, the remaining step for the wet weather RAA is scheduling of control measures *over time* to achieve interim milestones. Following an identical approach as the DC EWMP, the following wet weather milestones were used for development of the EWMP Implementation Plan, primarily based on the achieving the final limits of the DC Toxics TMDL by 2032 and addressing bacteria by 2040:

- Achieve 50% of the reduction for toxics/zinc[7] (2026)
- Achieve 75% of the reduction for toxics/zinc (2029)
- Final compliance with toxics/zinc WQBELs (2032)
- Final compliance with bacteria RWLs (2040)

The exception was the small area of Carson that drains to the Los Angeles River watershed. For this area, the zinc/metals milestones of 50% and 100% were set for 2024 and 2028, respectively, and the bacteria milestone is set for 2037. These milestones are also consistent with the ULAR EWMP.

[7] While these milestones are expressed as reduction in zinc, because zinc is a limiting pollutant, achievement of zinc RWLs by these dates assures even greater reduction in other Water Quality Priority pollutants.

4. Watershed Control Measures

In order to comply with EWMP requirements, an evaluation was performed that considered opportunities within the participating Permittees jurisdictions to utilize multi-benefit regional projects that, when feasible, retain non-stormwater discharge and the flows produced by the 85th percentile, 24-hour storm event. A review of relevant TMDL implementation plans and watershed management plans was performed to determine previously identified regional projects within the DC WMG. These projects were then evaluated to identify if they meet the regional EWMP project criteria. An approach was then developed and used to evaluate additional potential regional project sites. This section includes the approach and results of the evaluation.

The control measures analyzed and proposed in this EWMP are for reducing discharges of pollutants to the receiving waters to meet the planning objectives. Measures for managing sediments already within the Estuary are being developed as part of the Contaminated Sediment Management Plan (CSMP): Dominguez Channel Estuary, which was submitted to the Regional Water Quality Control Board in March of 2014 and are not described in this EWMP.

4.1 MCMs/Institutional BMPs

MS4 Permit Part VI.C.5.b.iv.(1) (pages 61-62) directs that the MCMs identified in Parts VI.D.4 to VI.D.10 (pages 70-141) be incorporated as part of the EWMP. The placement of this reference section within the EWMP portion of the permit (Part VI.C, pages 47-67) allows the MCMs in the subsequent section (VI.D, pages 67-141) to be assessed for potential effectiveness and even modified to emphasize the pollution control priorities identified within the EWMP Plan. Part VI.C.5.b.iv.(1).(c) (page 62) explicitly allows some MCM sections to be deleted, and wholly replaced, when accompanied by appropriate justification. The Planning and Land Development Program is not identified as an MCM that must be evaluated for potential modifications or elimination. The general MCMs categories identified in Part VI.D (pages 67-141) of the MS4 Permit are listed below. Some of the MCM categories are also applicable to the LACFCD, as indicated with an asterisk (*).

1. Public Information and Participation Program (PIPP) (Part VI.D.5, pages 86-88)*
2. Industrial/Commercial Facilities Program (Part VI.D.6, pages 88-94)*
3. Planning and Land Development Program (Part VI.D.7, pages 94-113)
4. Development and Construction Program (Part VI.D.8, pages 113-130)
5. Public Agency Activities Program (Part VI.D.9. pages 130-137)*
6. Illicit Connections and Illicit Discharges (IC/ID) Detection and Elimination Program (Part VI.D.10, pages 137-141)*

The 2012 MS4 Permit (VI.D.1.b.ii, page 68) requires that the MCM programs, as specified in the 2001 MS4 Permit, continue to be implemented until the EWMP is approved by the Regional Board.
MCMs are considered a subset of institutional BMPs (City of Los Angeles, 2013). Institutional BMPs are non-constructed control measures that prevent the release of flow/pollutants or transport of pollutants within the MS4 area (City of Los Angeles, 2013). Institutional BMPs include:

- Irrigation control
- Brake pad replacement (such as SB 346)
- Replacement of lead in wheel weights
- Street sweeping
- Catch basin cleaning
- Downspout disconnect program

At the time of submittal of this EWMP (February 2016), the DC WMG agencies do not plan to modify the baseline MCMs in the 2012 Permit. The decision whether to modify the MCMs will be re-evaluated during adaptive management, including during the 2017 EWMP update. The sections below describe the additional institutional control measures (beyond the baseline) to be implemented by the WMG agencies to achieve the 5% or 10% reduction assumed in the RAA.

4.1.1 Summary of MCMs and Institutional BMPs for the EWMP Implementation Plan

This section describes the MCMs and institutional BMPs that will be implemented as a component of the EWMP Implementation Plan. Research was conducted to quantify pollutant load reductions associated with MCMs and institutional BMPs. The research is presented in detail in Attachment M.

The pollutant reductions assumed to be achieved by the MCMs and additional institutional BMPs are summarized in Table 4-1. A summary of the actions and milestones for implementing these actions for each DC WMG agency are presented in the following subsections.

Table 4.1: Reductions associated with MCMs and Additional Institutional BMPs

Description	**Percent Reduction**	**Pollutants Addressed**
Implementation of 2012 Permit MCMs	5%	Varies per MCM
Enhanced Street Sweeping with Vacuum Sweepers – Enhanced MCM, **OR** Full Capture Devices in High-Trash Capture Areas – Enhanced MCM, **OR** Additional Catch Basin Cleanouts of those Full-Capture Devices – Enhanced MCM	5%	Sediment, Metals, Trash, Toxins, Nutrients
Total	**10%**	-

4.1.1.1. 2012 Permit MCMs

The existing MCMs/institutional BMPs within the DC WMG were evaluated and summarized based on the Los Angeles County Unified Annual Stormwater Reports for the Fiscal Years 2010-2011 and 2011-2012. Tables summarizing the existing MCMs/Institutional BMPs by DC WMG are presented in Attachment L.

The same six categories implemented under the 2001 MS4 Permit are being implemented under the 2012 MS4 Permit, except with more stringent requirements. Attachment K provides a detailed comparison of the program requirements of the 2001 MS4 Permit and the current 2012 MS4 Permit. The major changes include the following increased MCM levels:

- New requirements for erosion and sediment control procedures, especially for sites less than one acre, and for Erosion and Sediment Control Plans;
- Additional tracking requirements as part of the Industrial/Commercial Facilities Program; and
- Extensive new requirements for LID and hydromodification controls as part of the Planning and Land Development Program.

All DC WMG members will implement the MCMs as required in the 2012 MS4 Permit as presented in Table 4.2. The research conducted regarding the effectiveness of MCMs (detailed in Attachment M) justifies the assumption in the RAA that the 2012 MS4 Permit MCMs will achieve an additional 5% reduction compared to the previous baseline. In fact, averaging across the potential ranges, it was estimated that with aggressive and consistent MCM implementation, it is reasonable to see pollutant load reductions overall on the order of approximately 12% (Attachment M). However, to be conservative, only 5% reduction was assumed by the RAA to be achieved by the MCMs in the 2012 MS4 Permit.

Table 4.2: DC WMG Members to Implement Additional MCMs associated with 2012 MS4 Permit (beyond those in the 2001 MS4 Permit)

Jurisdiction	**Implement Completion**
Carson	2017
El Segundo	2017
Hawthorne	2017
Inglewood	2017
Lawndale	2017
Lomita	2017
Los Angeles	2017
County Unincorporated	2017

4.1.1.2. Additional Institutional BMPs

Some of the WMG agencies are implementing additional institutional BMPs to achieve additional pollutant load reduction. The following is a list of additional institutional BMPs considered by the DC WMG with a brief description:

- Full Capture Devices in High-Trash Capture Areas – Installing a device that traps all particles retained by a 5 mm mesh screen and may include BMPs such as catch basin opening covers or inserts, or hydrodynamic separators.
- Catch Basin Cleanouts of those Full-Capture Devices – Conducting additional cleaning out of the catch basins.
- Enhanced Street Sweeping with Vacuum Sweepers – Switching from mechanical sweepers to vacuum trucks and increasing frequency of cleaning if needed.

Based on the conducted research and best professional judgement, any one of these actions could achieve an additional 5% reduction. Shown in Table 4-3 and Table 4-4 are the milestones for implementing additional institutional BMPs by the WMG in the Machado Lake and Dominguez/LA Harbor watershed area, respectively. The additional institutional BMPs to be implemented by 2017 are bolded. Each agency, except city of Los Angeles, will implement an additional institutional BMPs by 2017 to achieve the extra 5% reduction (for a total of 10% reduction).

The City of Los Angeles is not taking credit for additional institutional BMPs. The catch basin cleanouts and full capture devices will be implemented after 2017, therefore credit would not be available until the next milestone, which is 2026. For the RAA, a total of 5% reduction was assumed for City of Los Angeles areas (due to 2012 MS4 Permit MCMs only).

The County of Los Angeles will incorporate regenerative sweepers in its street cleaning program by December 2016. Additionally, the County will expedite installation of full capture devices in catch basins within high trash generation areas. Installation targets are: 40% by December 2016; 80% by December 2017; and 100% by December 2018.

Table 4.3: Additional Institutional BMP Implementation Timeline per DC WGM Jurisdiction for Areas in the Machado Lake Watershed Only

Jurisdiction	Enhanced Street Sweeping	Full Capture Device	Basin Cleanouts
Carson	Not Implemented	Spring 2016	Spring 2016
Lomita	2017	Spring 2016	Spring 2016
Los Angeles	Not Implemented	Spring 2016	Spring 2016
County Unincorporated	2017	Spring 2016	Spring 2016

Table 4.4: Additional Institutional BMP Implementation Timeline for non-Machado Lake Areas per DC WGM Jurisdiction

Jurisdiction	Enhanced Street Sweeping	Full Capture Device in High-Trash Areas	Additional Catch Basin Cleanouts	Implementation Completion Year (Milestone)
Carson	Not Implemented	2017	2017	2017
El Segundo	2017	2026	2026	2026
Hawthorne	2017	2026	2026	2026
Inglewood	2017	2026	2026	2026
Lawndale	2017	2017	2017	2017
Lomita	2017	2026	2026	2026
Los Angeles	Not Implemented	2026	2026	Not Applicable
County Unincorporated	Beginning in 2019	2017	2017	2026

4.1.2 New and Re-Development

Part VI.C.4.c.i.(1) of the MS4 Permit requires Permittees to develop and implement LID ordinances applicable to new and re-development projects meeting specified thresholds of disturbance. Average annual redevelopment rates released by the City of Los Angeles (LAR UR2 WMA, 2015) were used to project the area that is expected to be developed between the modeled milestone dates. It can be assumed that the new and re-development projects will implement BMPs as required by the MS4 Permit, thus providing a load reduction based on the 85th percentile rainfall. Table 4.5 summarizes the percent of area re-developed at each of the milestone dates.

The annual re/development rates were used to project and simulate the effectiveness of LID control measures under LID ordinances in the RAA. Areas being redeveloped, as a result of the LID ordinances enforced within the DC WMG, were modeled using volume reduction BMPs sized for the 85th percentile storm depth. The projected capacities and managed volumes of stormwater are presented in Section 5.

Table 4.5: Re-Development Rates by Land Use						
Land Use	**Annual Dev. Rate**	**Percent of Area to be Developed by Milestone Year**				
		2018 Nutrient (100%)	**2019 Toxics (100%)**	**2026 Metal (50%)**	**2029 Metal (75%)**	**2032 Metal (100%)**
Commercial	0.15	0.45	0.60	1.65	2.10	2.55
Education	0.16	0.48	0.64	1.76	2.24	2.72
Industrial	0.34	1.02	1.36	3.74	4.76	5.78
Residential	0.18	0.54	0.72	1.98	2.52	3.06
Transportation	2.70	8.10	10.8	29.70	37.80	45.9

In addition, the Port of Los Angeles has coordinated with the Port of Long Beach to develop the Water Resources Action Plan (WRAP) as a comprehensive effort to improve water and sediment quality in western San Pedro Bay. One of the WRAP control measures addresses new and re-development within the Port areas (see https://www.portoflosangeles.org/environment/wrap.asp). As part of the program, and in coordination with other city departments, parameters have been agreed upon to ensure that port-specific conditions are reflected in LID measures instituted on port property (POLA and POLB, 2009). This is particularly important due to the unique operational needs for areas within the Port of Los Angeles, as well as the physical limitations for infiltration within these areas. As part of the EWMP adaptive management process, the DC WMG will continue to coordinate with the WRAP program regarding new and redevelopment projects within the Port of Los Angeles jurisdiction of the City of Los Angeles, and assess their potential contribution to pollutant load reductions to meet schedule milestones.

4.2 Structural BMPs

In order to address the identified priorities within a watershed, structural BMPs made up of both Regional and Distributed BMPs will be utilized.

Regional BMPs

Generally, regional BMPs will be installed on large public parcels. The strategy employed in this EWMP is to reduce volume to achieve the planning objectives. BMPs that reduce concentrations (treat and release) tend to achieve less pollutant load reduction per acre of land controlled. Additionally, the WMG members seek to achieve the additional benefit of water supply, if possible, among other additional benefits, from implementation of BMPs to meet the water quality planning objectives. This would emphasize BMPs that capture and store or capture and infiltrate water. Thus, the regional project BMP types that are generally sought and evaluated in this EWMP are:

- Infiltration Basins
- Detention Basins

Such regional projects can be structured to provide water for local irrigation or can be structured to augment a potable water supply, such as a municipal supply aquifer.

Distributed BMPs

Distributed BMPs for purposes of this EWMP are those BMPs installed directly by one or more of the DC WMG agencies that tend to have smaller footprints and capture and store or infiltrate water from smaller catchments than regional projects. As described above as well, emphasis in this EWMP is on storm water capture, storage, use, and/or infiltration type of BMPs that achieve a volume reduction in the watershed rather than treat and release type BMPs. The LID ordinance by cities is anticipated to result in LID implementation and the amount of LID capacity was projected based on growth rates (Section 4.1.2). In terms of BMP retrofits the distributed BMPs in this EWMP are primarily:

- Green Streets

To be specific, green streets, in the context of this EWMP, are modifications to streets that allow them to capture, store, and/or infiltrate some volume of water from the catchment leading to that street section. This can include a variety of design features including, but not limited to:

- Porous/Permeable Pavers
- Bioswales/Buffer Strips (that infiltrate)
- Biofiltration (that infiltrate)
- Bioretention (that infiltrate)
- Rainfall Harvesting (Rain Barrels & Cisterns) (in the street right of way)

Figure 4-1 shows a depiction of possible green street features. The specific features of the green streets in this plan have not been determined yet, but will be evaluated and established on a case by case basis for each street where a green street is considered optimal for meeting the water quality planning objectives.

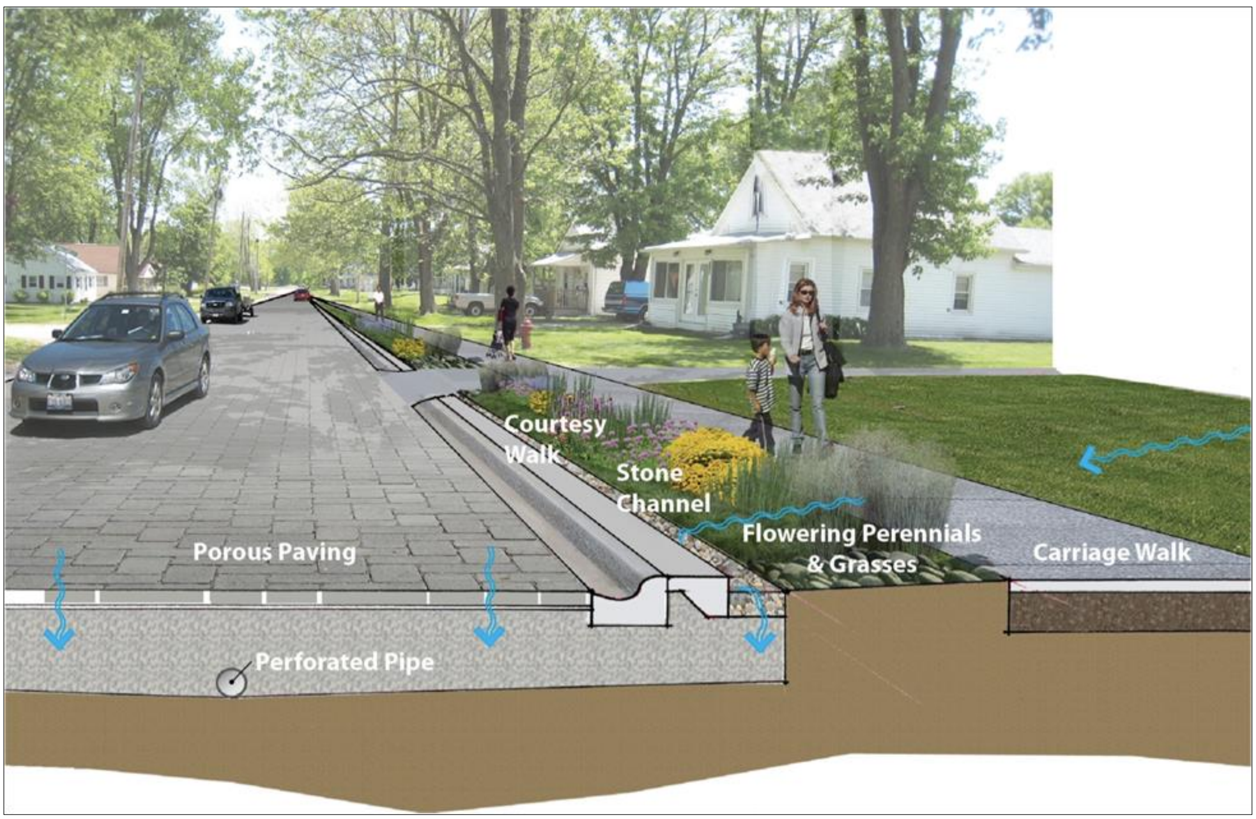


Figure 4-1: Possible Green Street Features

4.2.1 Categories of Structural BMPs

Table 4.6 illustrates the categories and subcategories of structural BMPs. This presents a broad overview of the types of structural BMPs that are available. Some of these BMPs types are currently installed, mostly on private parcels through the new and re-development program, within the DC WMG area and are presented in Figure 4-2[8]. The BMPs in Table 4.6 were also considered as potential project alternatives. Based on project site characteristics, which are evaluated in a later section, an appropriate BMP type can be selected.

Table 4.6: Categories and Subcategories of Structural BMPs Within DC WMG

Category	**Subcategory**	**Example BMP Types**
Regional	Infiltration	Surface infiltration basin, subsurface infiltration gallery
	Detention	Surface detention basin, subsurface detention gallery
	Constructed Wetland	Constructed wetland, flow-through/linear wetland
	Treatment Facilities	Facilities designed to treat runoff from and return it to the receiving water
	Low Flow Diversions	BMPs that divert runoff to the sanitary sewer (normally dry weather only)
Distributed	Site-Scale Detention	Dry detention pond, wet detention pond, detention chambers, etc.
	Green Infrastructure	**Biofiltration** includes vegetated BMPs with underdrains
		Bioretention includes vegetated BMPs without underdrains
		Permeable pavement
		Green streets (often an aggregate of bioretention, biofiltration and/or permeable pavement)
		Infiltration BMPs include non-vegetated dry wells, infiltration trenches, etc.
		Bioswales include vegetative filter strip and vegetative swales
		Rainfall harvest (rain barrels, green roofs and cisterns)
	Flow-through Treatment BMPs	Treatment BMPs with a minor (or non-existent) infiltration component, often modular/vault-type BMPs including cartridge media filters
	Source Control Structural BMPs	Catch basin inserts, screens, hydrodynamic separators, trash enclosures, etc.

[8] The Cities of Carson and Lawndale were not included within this analysis as those cities were added to the DC EWMP at a later time (August 2015) within the planning process. See Attachments Z and AA for more information on the inclusion of Carson and Lawndale within the DC EWMP.

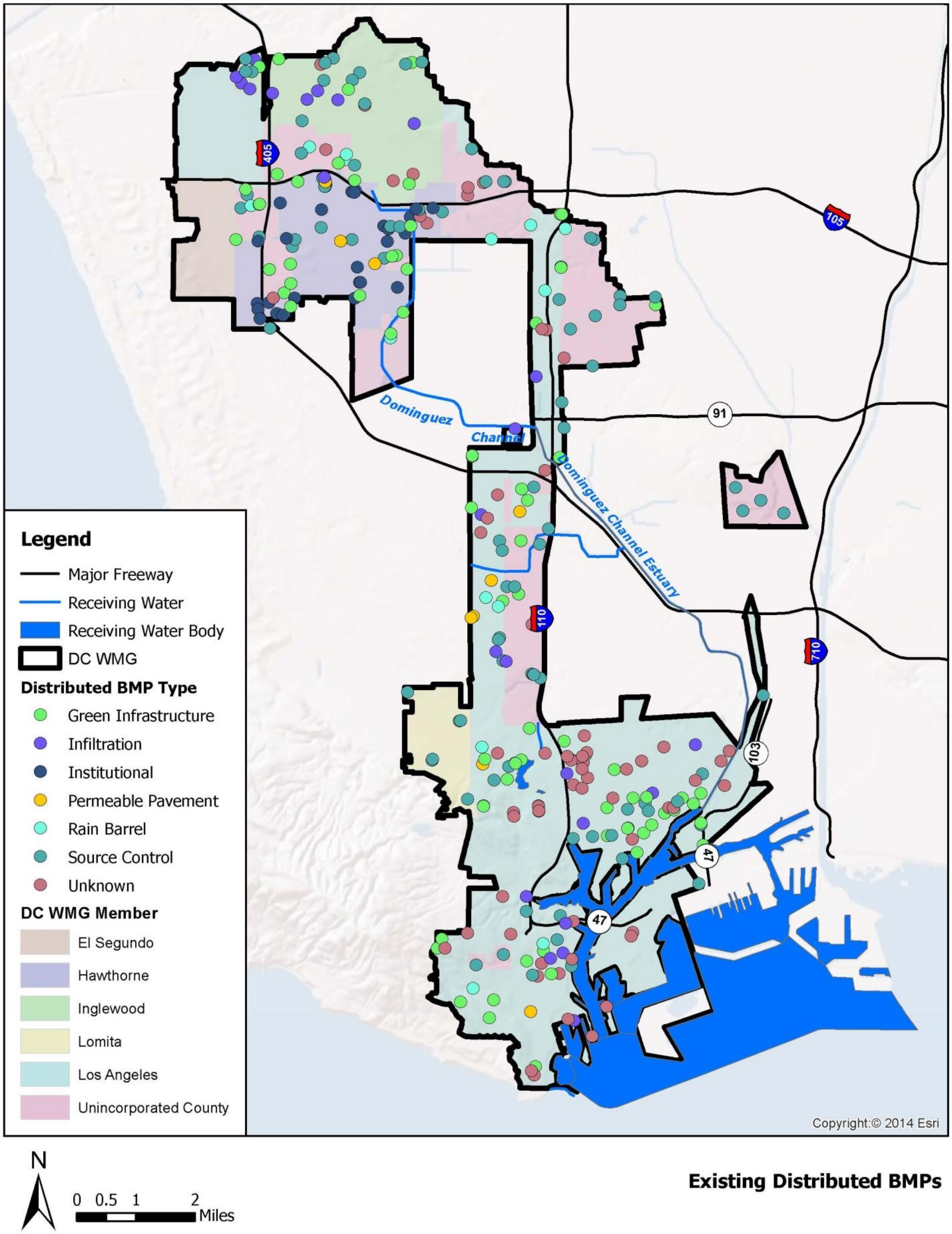


Figure 4-2: Existing Distributed BMPs

4.2.2 Summary of Existing Structural BMPs

To compile information on existing control measures, including MCMs and BMP programs already in effect for each of the participating Permittees in the EWMP, information was collected from the following available sources:

- Los Angeles County Unified Annual Stormwater Report for Fiscal Years 2010-2011 and 2011-2012
    - Summary of MCMs for the Dominguez Channel Watershed
    - Summary of BMPs Installed and Maintained for the Dominguez Channel Watershed
    - Individual Annual Reports for each of the participating Permittees
- Standard Urban Stormwater Mitigation Plans (SUSMP) and LID projects in DC WMG
- City of Los Angeles Green Infrastructure Project List
- Proposition O Project Website (www.lapropo.org)
- Opti Website (http://irwm.rmcwater.com/la/login.php)

The Los Angeles County Unified Annual Stormwater Report for Fiscal Years 2010-2011 and 2011-2012 has been used to create tables identifying the existing structural BMPs installed and maintained by the DC WMG and is included as Attachment N. The information provided by the DC WMG has been incorporated into the tables. Information pertaining to the existing MCMs implemented by the DC WMG are discussed in Section 4.1, and tables created based on the Unified Annual Stormwater Reports for Fiscal Years 2010-2011 and 2011-2012 can be found in Attachment K.

The SUSMP and LID project listings provided by the DC WMG have been used to map the existing distributed BMPs located in Figure 4-2. The figure only includes the BMPs for which an address or global positioning system (GPS) coordinates was provided. It is assumed that the SUSMP and LID BMPs were also reported as part of the annual reports.

BMPs, including regional BMP projects, implemented prior to the baseline pollutant loads being used for the RAA calibration (2012) are considered part of the baseline. BMPs, including regional projects, which were implemented after the baseline pollutant loads, can be modeled in the RAA in order to demonstrate a load reduction. A few regional projects have been implemented in the DC WMG utilizing City of Los Angeles Proposition O funding. The Lake Machado Water Quality Improvements Project and the Rosecrans Recreation Center Stormwater Enhancements Project were constructed following the pollutant load baseline estimation and are evaluated below based on EWMP project criteria.

Lake Machado Water Quality Improvements, including Wilmington Drain

Specific drivers for the Machado Lake Ecosystem Rehabilitation and Wilmington Drain Multi-Use projects are to improve water quality, meet adopted and future TMDLs, enhance riparian, wetland, and upland habitat, improve hydrologic and hydraulic conditions, and create and restore recreational amenities (City of Los Angeles, 2009). The project received its Notice to Proceed in May 2013, broke ground on March 22, 2014, and has an anticipated completion date in April 2017. The Wilmington Drain is a channelized stream that conveys urban runoff and stormwater flows to Machado Lake. The Wilmington Drain feeds more than 80% of the water that flows into Machado Lake from its 15,553 acre watershed. A majority of the Machado Lake and Wilmington Drain improvements involve enhancing the habitat and incorporating BMPs that will help with treatment components. The area will utilize bioswales in the parking areas, incorporate smart irrigation systems, install trash netting systems, include the use of biofilters and similar vegetated BMPs, and improve the pedestrian trail system (Measure O). This project has been jointly funded by the City of Los Angeles and the LACFCD. The project incorporates numerous distributed BMPs that will reduce the amount of flow reaching downstream receiving waters, but the main intention of the project is to provide treatment. This project is not projected to provide a volume reduction; it would be characterized as a "treat and release" type of project.

Machado Lake will be recharged with advance treated water conveyed from the Terminal Island Water Reclamation Plant (TIWRP). This highly treated water will dilute local runoff to achieve the waste load allocations in Machado Lake.

Rosecrans Recreation Center Stormwater Enhancements

The Rosecrans Recreation Center Stormwater Enhancement project was completed in October 2013. The project achieved some of the goals outlined in the 2013 IRWMP and included the installation of smart irrigation systems, bioswales in parking lots, permeable parking lots, vegetated retention basins, infiltration cisterns/irrigation cisterns, a synthetic soccer field, landscaped areas, and decomposed granite pathways. The project treats a tributary watershed of 12.73 acres made up of mostly the park and some surrounding residential areas (CDM Rosecrans Recreation Center, 2006). This project incorporates water capture and use of stormwater; however, most of the water captured is from outside of the DC WMG area. Because of this, the impact of this project is negligible and does not affect the RAA or meeting the EWMP water quality planning objectives.

4.2.3 BMP Planning Process Completed Prior to Development of the EWMP

The following existing TMDL implementation plans and watershed management planning documents were reviewed as part of the development of the EWMP to identify potential projects for inclusion:

- 2014 Machado Lake Nutrients and Toxics TMDL Lake Water Quality Management Plan
- 2013 Public Draft Update for the Greater Los Angeles County (GLAC) Integrated Regional Water Management Plan (IRWMP);
- 2013 Proposition O (Clean Water Bond Program) October Monthly Report;
- 2012 GLAC IRWMP Update, the Greater Los Angeles County Open Space for Habitat and Recreation;
- 2012 GLAC IRWM South Bay Subregional Plan;
- 2011 Multi-pollutant TMDL Implementation Plan for the County of Los Angeles Unincorporated Area of Machado Lake Watershed;
- 2004 Dominguez Watershed Management Master Plan (DWMMP);
- 2003 Dry-Weather Discharge Treatment Feasibility Study submitted by the County of Los Angeles Department of Public Works Watershed Management Division;
- Opti, part of the GLAC IRWMP online project database; and
- Los Angeles County Clean Water, Clean Beaches online project database.

These documents were also reviewed in an effort to identify planned projects that were evaluated to determine if they meet the EWMP criteria for regional projects and represent feasible implementation options. These projects are included in Figure 4-2 and, because they were in service prior to 2012, their effects on load reductions and receiving water concentrations are built into the receiving water data used to calibrate the model and are represented by the baseline. Some of the references include broad plans outlining the steps necessary towards improving water quality and recommending different BMPs under different conditions. These documents provided conceptual scenarios without going into great detail. In addition, data was obtained from Opti and the Los Angeles Clean Water, Clean Beaches online project databases. The data reviewed included no information regarding planned distributed public BMP projects.

Plans Reviewed and Incorporated into this EWMP

The existing plans developed by DC WMG members were reviewed and are listed below. The EWMP and associated implementation actions replace the previous plans and addresses the various TMDLs.

- Los Angeles Harbor Bacteria TMDL

- Dominguez Channel and Greater Los Angeles and Long Beach Harbor Toxics TMDL
- Machado Lake Nutrient TMDL
- Machado Lake Nutrient & Toxic TMDL Monitoring & Reporting Plan for the Los Angeles County Flood Control District
- Machado Lake Nutrients and Toxics TMDL Lake Water Quality Management Plan
- Multipollutant TMDL Implementation Plan for the County of Los Angeles Unincorporated Area of the Machado Lake Watershed
- Machado Lake Pesticides and PCBs TMDL

4.2.4 Process of Identifying and Selecting Multi-Benefit Regional Projects (EWMP Regional Projects)

The approach described below was used to identify, screen, and evaluate potential regional projects[9]. This approach included a watershed based assessment of all publicly-owned and some private parcels within the DC WMG to evaluate if they would be suitable to support a regional stormwater enhancement project. The approach to identifying potential regional projects is illustrated in Figure 4-3. The process is discussed generally in the sections below and in detail in Attachment O.

Table 4.7 lists scoring and ranking criteria and how the parcels were scored based on those criteria. The right most column of Table 4.7 lists if Geographical Information System (GIS) data were useable for autonomous scoring of the parcels. Following the autonomous scoring of the parcels, parcels were visually evaluated to assess if they could conceivably provide sufficient space for a regional project that retains the 85th percentile storm from a catchment area outside the parcel itself.

For visual evaluation, the following screening criteria were adhered to:

1. Score using the GIS approach.
2. Identify Assessors Identification Numbers (AIN) ending in 900s. These represented tax exempt parcels, which, if tax-exempt, were assumed therefore to be government owned and likely owned by a DC WMG agency. Once identified in the Tier 1 list as noted below and considered potentially suitable, ownership research was conducted to verify if they were owned by a DC WMG agency.
3. Specify which Tier a parcel should be categorized in based on its land use.

   Tier 1: 900 coded open space, parks, golf courses, vacant

   Tier 2: 900 coded everything else, with the exception of education

   Tier 3: non-900 coded (privately owned) open space, parks, golf courses, vacant

   Tier 4: education – both 900 and non-900 coded

   Tier 5: everything else – non-900, non-education, non-park/open space/golf course/vacant.
4. Exclude Tier 5; if a Watershed Management Group (WMG) member or stakeholder brings a Tier 5 parcel forward, it can be evaluated further for feasibility.
5. Exclude parcels < 0.25 acres. These would have insufficient space for regional retention.
6. Exclude parcels that are part of natural water body.
7. Exclude parcels at edge of the DC WMGA. These would not collect significant water from the DC WMGA jurisdictions.

[9] Similar processes were used for identifying and selecting regional projects within the cities of Carson and Lawndale. These processes and resulting projects identified are reported in Attachments Z and AA.

8. Exclude parcels with more than 60 to 70% buildings based on visual inspection of Google Earth and views available on or after December 2014.
9. Exclude open space parcels that have been developed based on visual inspection. It is important to note that a number of parcels labeled as "open space" were developed and their land use designation not changed in the parcel data available.
10. Exclude parcels that have less than approximately 10 acres tributary to them. This was not strictly adhered to, but in general, parcels that could collect water from 10 acres upstream of them were preferred.
11. Of the 900 series that survive this screening, review the ownership. If available data indicates the property is owned by WMG agencies, select as potential regional projects.
12. Review the unselected 900 series and the non-900 series that survive this screening and list the top 100 to 200 scores from those.
13. Visually inspect the top 100 to 200 and identify those that may have better potential to explore further based on potential catchment area, potential space on site and size of site, and potential ownership.

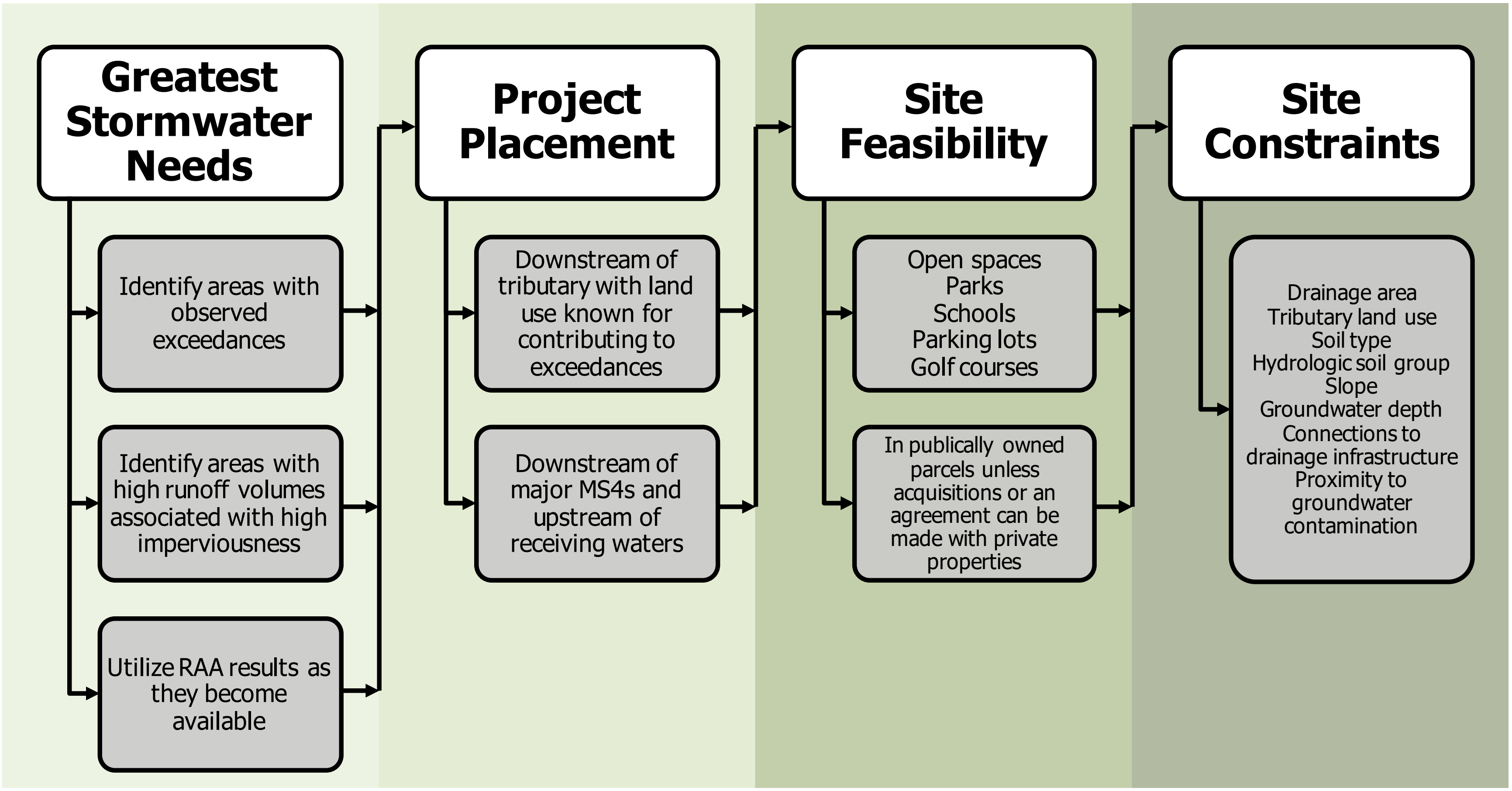


Figure 4-3: Approach to Identifying Potential Regional Projects

Table 4.7: Ranking Criteria

Criteria		Points 0	1	2	3	4	5	GIS Coverage
General Criteria	Proximity to an Outfall (mile) (x2)	3.0 ≤ X	2.5 ≤ X < 3.0	2.0 ≤ X < 2.5	1.5 ≤ X < 2.0	1.0 ≤ X < 1.5	0 ≤ X < 1.0	X
	Proximity to 36" Storm Drain (feet)[1]	1,000 ≤ X	800 ≤ X < 1000	600 ≤ X < 800	400 ≤ X < 600	200 ≤ X < 400	0 ≤ X < 200	X
	Land Use (x2)	Restricted Area (DOD)	Private requiring demolition of structures	Private with large parking lots requiring no changes to land use	Schools and Golf Courses	Public Buildings	Public Open Space	X
	Parcel Size (acre)	X < 0.25	0.25 ≤ X < 1.0	1.0 ≤ X < 2.0	2.0 ≤ X < 3.0	3.0 ≤ X < 4.0	4.0 ≤ X	X
	Catchment Area[2]	X<1	1 ≤ X < 25	25 ≤ X < 50	50 ≤ X < 75	75 ≤ X < 100	100 ≤ X	
Underlying Soil Conditions	Contamination[3]	Superfund	Possible Contamination				Certain no contamination	X
	CPI		1	2	3	4	5	X
	Soil Infiltration Rate (inches/hour)	X < 0.3	0.3 ≤ X < 0.5	0.5 ≤ X < 0.7	0.7 ≤ X < 0.9	0.9 ≤ X < 1.1	1.1 ≤ X	X
	Slope (%)	10 < X	5 < X ≤ 10	3 < X ≤ 5	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	
	Liquefaction Areas	Possible Liquefaction					No Liquefaction	X
	Landslide Areas	Possible Landslide					No Landslide	X
	Depth to Groundwater (feet)[2,4]		X ≤ 10				10 < X	
	Depth to Storm Drain Infrastructure (feet)[2]	15 ≤ X	10 ≤ X < 15	5 ≤ X < 10	3 ≤ X < 5	0 < X < 3	X=0 (open channel/ gutter)	

Notes:
1. Based on distance to midpoint of GIS pipeline segment to centroid of parcel.
2 GIS data coverage not currently available.
3 Superfund information only.
4 Site specific conditions may allow variances.

The potential project footprints are based on stormwater storage areas of sufficient size to infiltrate in 72 hours or to store the 85th percentile storm in 10 feet of depth unless otherwise noted. In most cases, areas needed to infiltrate in 72 hours were larger than the area needed to store the storm volume in 10 feet of depth.

From the tier 1 list, after the additional manual screening, a total of nine parcels were identified that show promise for placement of regional projects that capture some catchment area and may be controlled by Watershed Management Group (WMG) members for: (listed in order from the northern part of the watershed to the southern part)

1. Chester Washington Golf Course
2. El Segundo Pump Station
3. Jim Thorpe Park
4. Ramona Park
5. Hawthorne Memorial Park
6. Darby Park
7. Harbor City Park
8. Averill Park
9. Wilmington Recreation Center

These top ranked project parcels were recommended for implementation and a preliminary feasibility evaluation was performed. Concept drawings were prepared for the recommended projects and are provided in Attachment P.

As the cities of Carson and Lawndale were incorporated into the DC WMG, separate processes were implemented to identify regional projects to manage runoff from their jurisdictions. Attachments Z and AA report these processes and resulting regional projects selected. These regional projects include:

1. Alondra Park
2. Carriage Crest Park
3. City Hall/Civic Center

The Alondra Park site is owned by the County of Los Angeles and is located just outside the City of Lawndale. Through coordination of the County of Los Angeles and the City of Lawndale, the Alondra Park site was included within the EWMP as Lawndale was incorporated within the DC WMG. Carriage Crest Park and City Hall/Civic Center regional project sites are located within the City of Carson.

Table 4.8 lists the recommended projects within the DC WMG and identifies the space available, drainage area, design volume, volume provided based on the concept drawings, and anticipated multi-benefits for each project. With the exception of the Alondra Park project, the design volume for each regional project was based on the 85th percentile, 24-hour rain event. Given the size of the Alondra Park drainage area and project site constraints, the Alondra Park regional project design volume was determined through modeling performed in the RAA, and is less capacity than the required volume to capture the 85th percentile, 24-hour rain event. For each regional project, Table 4.9 lists the total area and impervious area of each DC WMG jurisdiction within the project drainage area. The project sites are illustrated in Figure 4-4. Although these top twelve projects were the only projects evaluated, additional tier 1 parcels will continue to be investigated by the DC WMG, as appropriate.

Table 4.8: Regional Project Site Summary

Project Site	Ownership	Parcel Size (ac)	Drainage Area[3] (ac)	Design Storm Runoff Volume (ac-ft)	Storage Volume (ac-ft)	Summary of Multi-Benefits
Chester Washington Golf Course (North)	County[1]	116	425	25.8	26.4	Groundwater recharge, flood control benefits, potential water reuse, trash capture, public outreach and education
Chester Washington Golf Course (South)			372	22.0	26.1	
El Segundo Pump Station	El Segundo	6.2	574	27.0	27.0	Groundwater recharge, flood control benefits, trash capture, public outreach and education
Jim Thorpe Park	Hawthorne	7.6	378	16.0	16.0	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Ramona Park	Hawthorne	1.7	273	12.9	12.9	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Hawthorne Memorial Park	Hawthorne	6.6	202	8.2	8.2	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Darby Park	Inglewood	19.5	106	5.2	5.2	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Harbor City Park	Los Angeles	14.8	1,398	77.0	80.7	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Averill Park	Los Angeles	10.7	413	21.4	21.4	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Wilmington Recreation Center	Los Angeles	7.2	273	12.9	12.9	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
Alondra Park	County[2]	203	3,461	77.8	77.8	Groundwater recharge, flood control benefits, potential water reuse, trash capture, public outreach and education

Table 4.8: Regional Project Site Summary

Project Site	Ownership	Parcel Size (ac)	Drainage Area[3] (ac)	Design Storm Runoff Volume (ac-ft)	Storage Volume (ac-ft)	Summary of Multi-Benefits
Carriage Crest Park	Carson	4.8	180	8.5	9	Groundwater recharge, flood control benefits, enhancement of existing park facilities, trash capture, public outreach and education
City Hall/Civic Center	Carson	4.6	1,110	9.2	9.2	Groundwater recharge, flood control benefits, enhancement of existing public space, trash capture, public outreach and education

[1] Facility is owned by the County, but operated under lease by American Golf.

[2] Facility is owned and operated by the County. If the project is determined during the design phase to require linkage to the neighboring Alondra golf course (e.g., water reuse, space for project construction), that golf course is owned by the County but operated under lease by Alondra Golf Course, Inc.

[3] Regional projects are sized to manage runoff limited to portions of drainage areas within the DC Watershed Management Area (Figure 1-1). Runoff from portions of drainage areas outside of the Watershed Management Area are assumed to be managed by separate means. However, there is future opportunity to coordinate with jurisdictions outside of the DC WMG on Regional Projects within the DC EWMP through the adaptive management process.

Table 4.9: Regional Project Drainage Areas by Jurisdiction

Project Site	Jurisdictional Total Area and Impervious Area within each Regional Project Drainage Area (ac)															
	City of Carson		City of El Segundo		City of Hawthorne		City of Inglewood		City of Lawndale		City of Lomita		City of Los Angeles		Los Angeles County	
	Total	Imp.	Total	Imp.	Total	Imp.	Total	Imp.	Total	Imp.	Total	Imp.	Total	Imp.	Total	Imp.
Chester Washington Golf Course (North)	--	--	--	--	--	--	--	--	--	--	--	--	2.2	1.9	422	243
Chester Washington Golf Course (South)	--	--	--	--	--	--	--	--	--	--	--	--	11	8.3	361	169
El Segundo Pump Station	--	--	324	239	--	--	--	--	--	--	--	--	--	--	--	--
Jim Thorpe Park	--	--	--	--	262	161	--	--	--	--	--	--	--	--	--	--
Ramona Park	--	--	--	--	62	38	--	--	--	--	--	--	--	--	128	62
Hawthorne Memorial Park	--	--	--	--	199	141	--	--	--	--	--	--	--	--	--	--
Darby Park	--	--	--	--	--	--	65	34	--	--	--	--	--	--	--	--
Harbor City Park	--	--	--	--	--	--	--	--	--	--	856	478	393	222	144	93
Averill Park	--	--	--	--	--	--	--	--	--	--	--	--	412	134	--	--
Wilmington Recreation Center	--	--	--	--	--	--	--	--	--	--	--	--	170	105	--	--
Alondra Park	--	--	513	388	713	456	--	--	1,242	754	--	--	--	--	204	91
Carriage Crest Park	180	78	--	--	--	--	--	--	--	--	--	--	--	--	--	--
City Hall/Civic Center	756	410	--	--	--	--	--	--	--	--	--	--	--	--	--	--

A field investigation was completed at five of the twelve identified sites (two investigations were performed at Chester Washington Golf Course, on the north and south sides). The investigation consisted of background geologic literature review and a Cone Penetrometer Tests (CPT) to depths below the bottom of the planned retention systems or when refusal was encountered. The results of these field investigations are provided in Attachment Q. The investigations suggested that the infiltration rates being used to assess the performance of the regional projects are within appropriate ranges.

Further field investigations of the remaining seven sites will be performed during the design phase of regional projects (Table 5.1) to obtain critical data to inform designs. Performing these investigations during the design phase is important so that design engineers guide the types of analyses and tests to be undertaken, ensuring that relevant data is collected to inform decisions that can influence designs. Therefore, of the five identified sites investigated as part of the EWMP, those investigations will be re-evaluated during the regional project design phase to determine if additional investigations are required. For the remaining seven sites, field investigations will be performed at the beginning of the design phase of the regional projects.

All of the regional project concepts, with the exception of the El Segundo Pump Station, involve subsurface storage that promotes infiltration using perforated steel reinforced poly-ethylene (SRPE) cisterns or a concrete vault with a perforated bottom. It is preferable to infiltrate the captured volume of water within 72 hours as that is the presumptive vector (mosquito) control standard for the Los Angeles County Department of Public Health. In some locations, there was insufficient footprint to infiltrate within 72 hours given the published potential infiltration rates of the site surficial soils as they are currently mapped. In those locations, deeper vaults were considered necessary to capture the control volume. It would infiltrate, but not within 72 hours. These locations were at such depth that, based on prior work siting subsurface retention in Los Angeles County, the Department of Public Health would be likely to consider the depth of the vault to be sufficient to prevent vector breeding from occurring in the vault.

Flows from the existing storm drain system will be diverted to the project sites through gravity. No pump stations are planned at this time. The need for pumping would be evaluated on a case by case basis during project concept planning.

The water captured could potentially be used to supplement irrigation, where the demand justifies such use. If not used for irrigation, it would generally infiltrate into the shallow groundwater basin. To move the water into a drinking water aquifer, injection would be necessary as described in Section 4.2.6.

At the El Segundo Pump Station site, the existing pump stations basin will be re-graded to promote better infiltration and increased capacity. The El Segundo Pump Station site recharge will increase the groundwater pressures to assist with the West Coast Basin Seawater Barrier.

With the exception of Alondra Park, the recommended regional project sites were modeled in the RAA by setting the drainage area tributary to the sites as compliant when the project provides the 85th percentile, 24-hour storm event volume or greater capture. These projects are considered regional EWMP projects and satisfy the criteria identified in Part VI.C.1.g of the MS4 Permit. All of these regional project sites proposed capture a volume greater than or equal to the 85th percentile, 24-hour storm volume generated from their subcatchments within the DC WMG.

The Alondra Park project was challenged with a large drainage area and site constraints that confined the size of a project to a ball field and parking lot, and avoid disruption of the golf course. As a result, the modeling included within the RAA sought to minimize the size of the project by focusing on the capture of a stormwater volume determined in the RAA to provide necessary pollutant reductions, in combination with other watershed control measures within the drainage area. However, during the design phase of the project, additional investigations or discussions with the site operators may determine that the site is sufficient to size a project that captures runoff from the 85th percentile, 24-hour storm event.

4.2.4.1. Regional Project Descriptions

Detailed project concepts were developed for ten of the twelve recommended regional projects. These concepts vary based on the water storage required, available surface area, and infiltration rates of the project's location. Some projects utilize large diameter perforated pipes for subsurface infiltration while others utilize concrete vaults with perforated bottoms. All of the regional projects include one project concept, except the Chester Washington Site. The Chester Washington has two tributary areas and has one storage system in the northern portion of the site and a second in the southern portion of the site to capture flow from both tributary areas. Concept factsheets for the ten recommended regional projects are provided in Figure 4-5 through Figure 4-14 below, showing each projects' cross section, site and design parameters, site renderings, and locations within the DC WMG boundary area. Additional information regarding cone penetrometer testing for a preliminary assessment of soil types for nine of these selected locations can by found in Attachment Q. Concepts for Alondra Park and City Hall/Civic Center regional projects will be developed during the EWMP implementation schedule (Table 5.1). The sites are shown on a map in Figure 4-4.

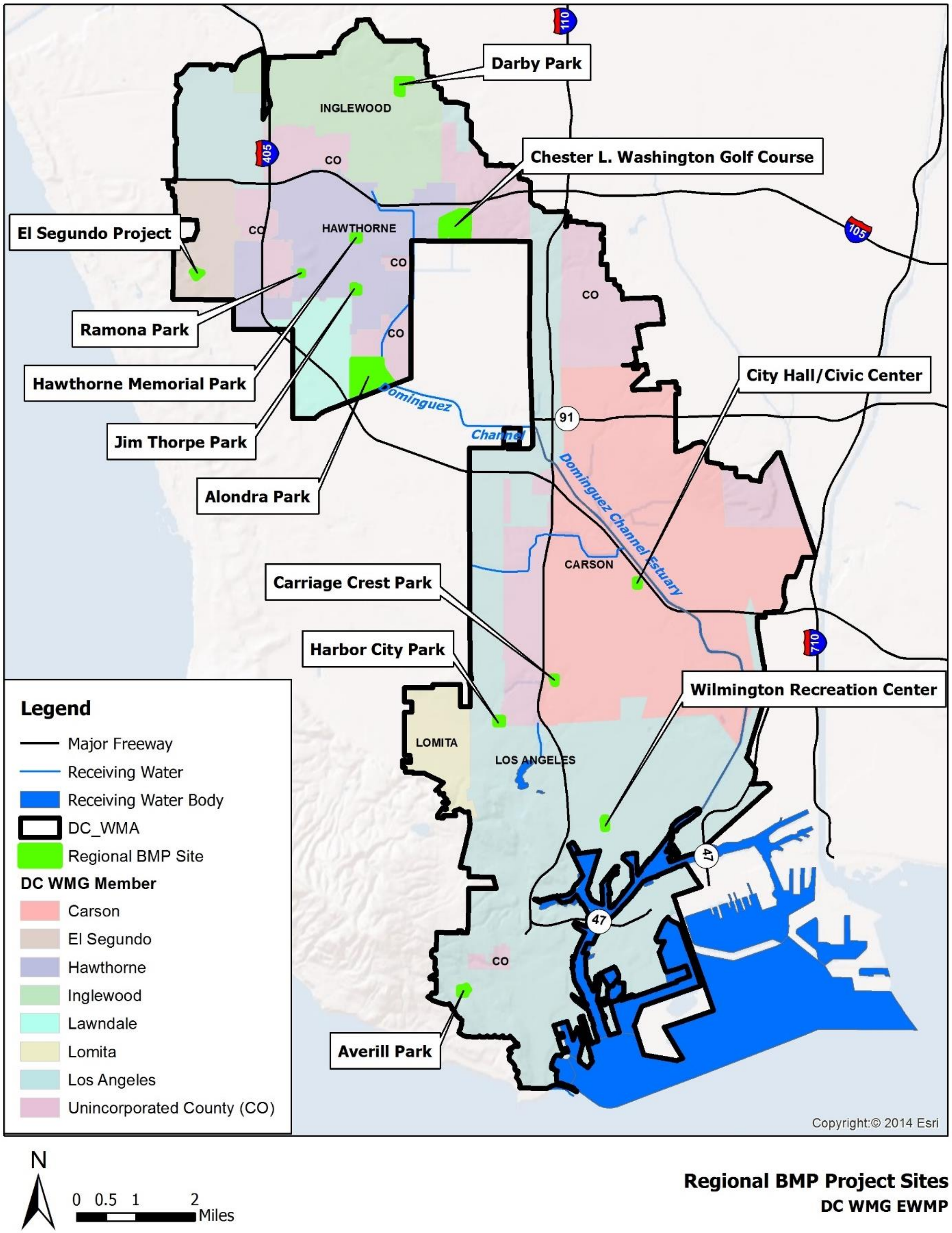
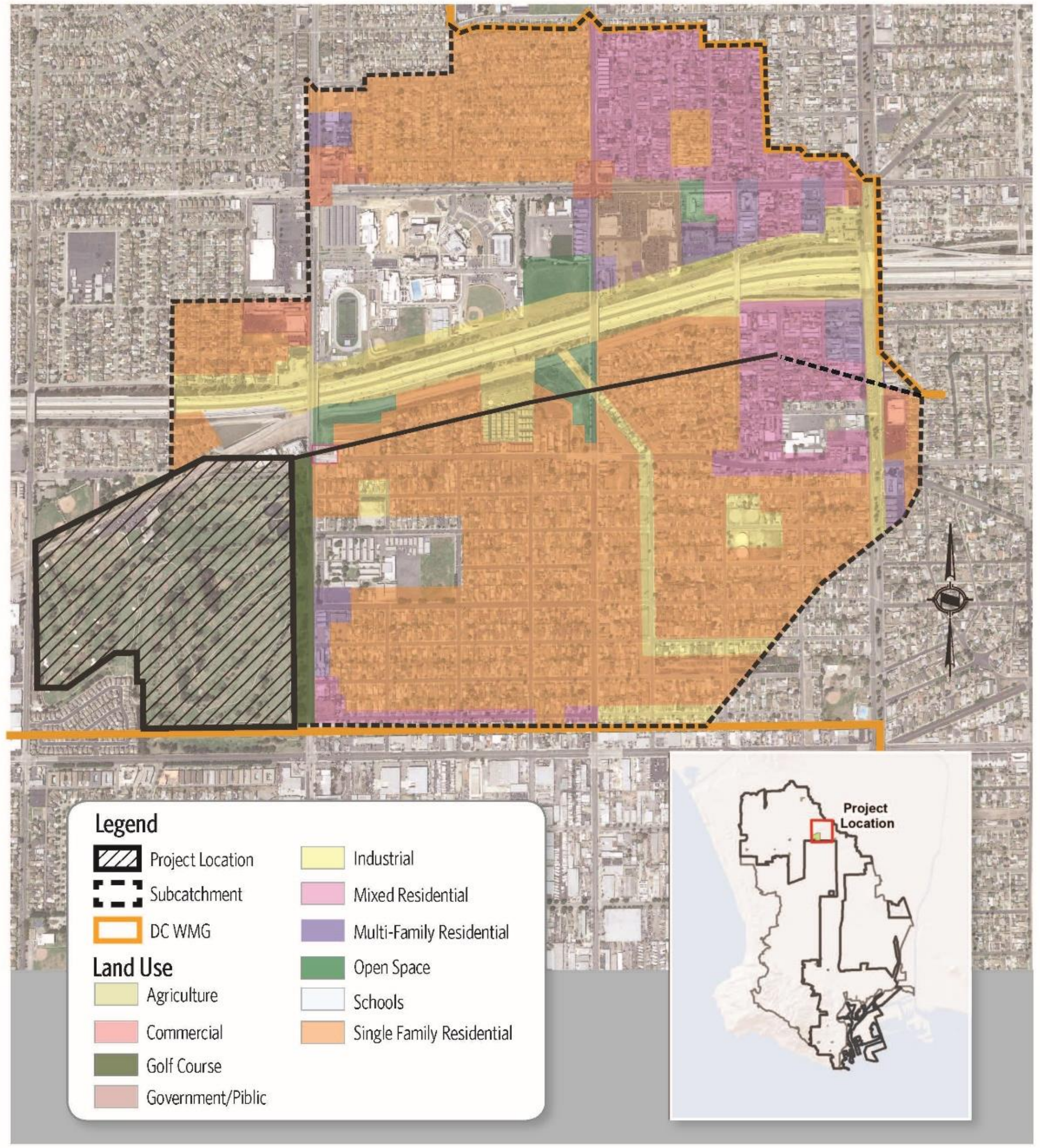


Figure 4-4: Regional BMP Project Sites



DOMINGUEZ CHANNEL WATERSHED EWMP

PRELIMINARY DESIGN CONCEPTS

Chester Washington Golf Course Project Site

Chester Washington Golf Course		
Item	**Detail**	
Ownership	Los Angeles County	
AIN	4057-032-900	
Address	1930 W 120th St., Los Angeles, CA 90047	
Infiltration Rate (in/hr)	0.45	
Groundwater Basin	West Coast and Central	
Site Area (acre)	116	
	NORTH	SOUTHWEST
Drainage Area (acre)	636	542
Design Volume (ac-ft)	25.8	22
Latitude and Longitude	33°55'23.61"N 118°18'36.90"W	33°55'1.51"N 118°18'36.90"W
Major Watershed/Tributary	Dominguez Channel	
Existing Site Description	Golf Course, Open Space	
Soil Type	Ramona Loam	
Drainage Area Total Impervious (%)	3	
Design Storm Event Rainfall Depth (in)	0.95	
Proposed Retrofit Description	Concrete Vault with Perforated Bottom	23 Rows of 120" Perforated Pipe
BMP Footprint (Cubic Feet)	96,000	141, 252
Media Depth (Feet)	31	33
Construction Cost ($, millions)	59.6	
Annual Maintenance Cost ($, millions)	0.5	
Design and Construction Time	7.5	
Completion Year	2026	

NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.
3. Rendering only shows Chester Washington South Project.

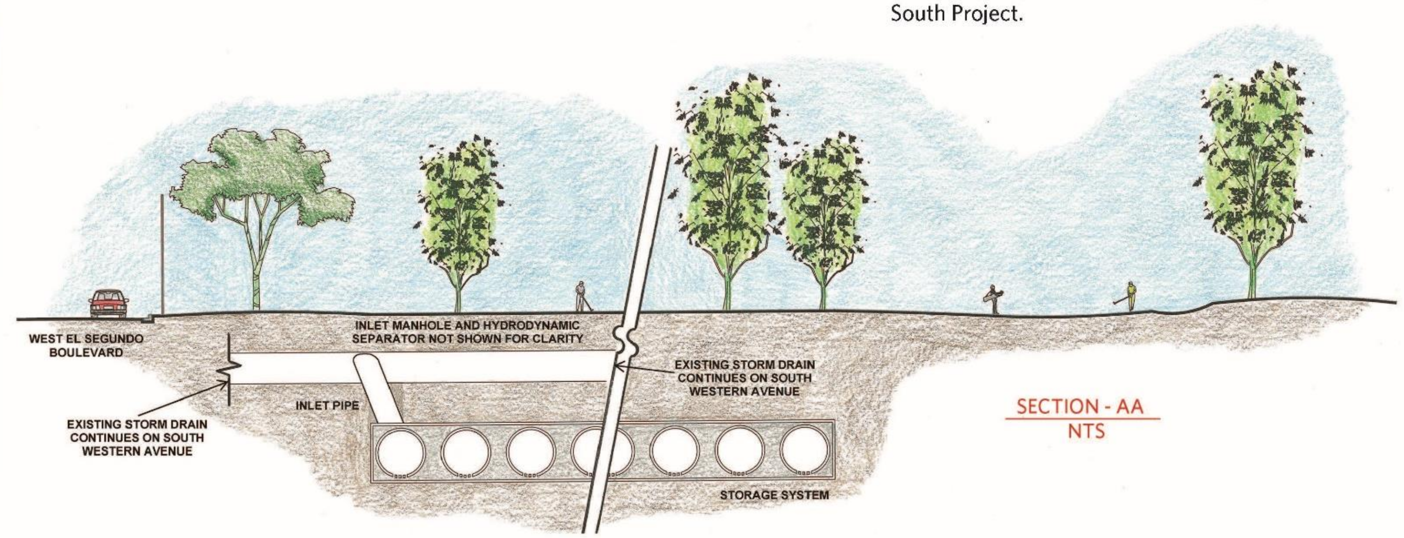
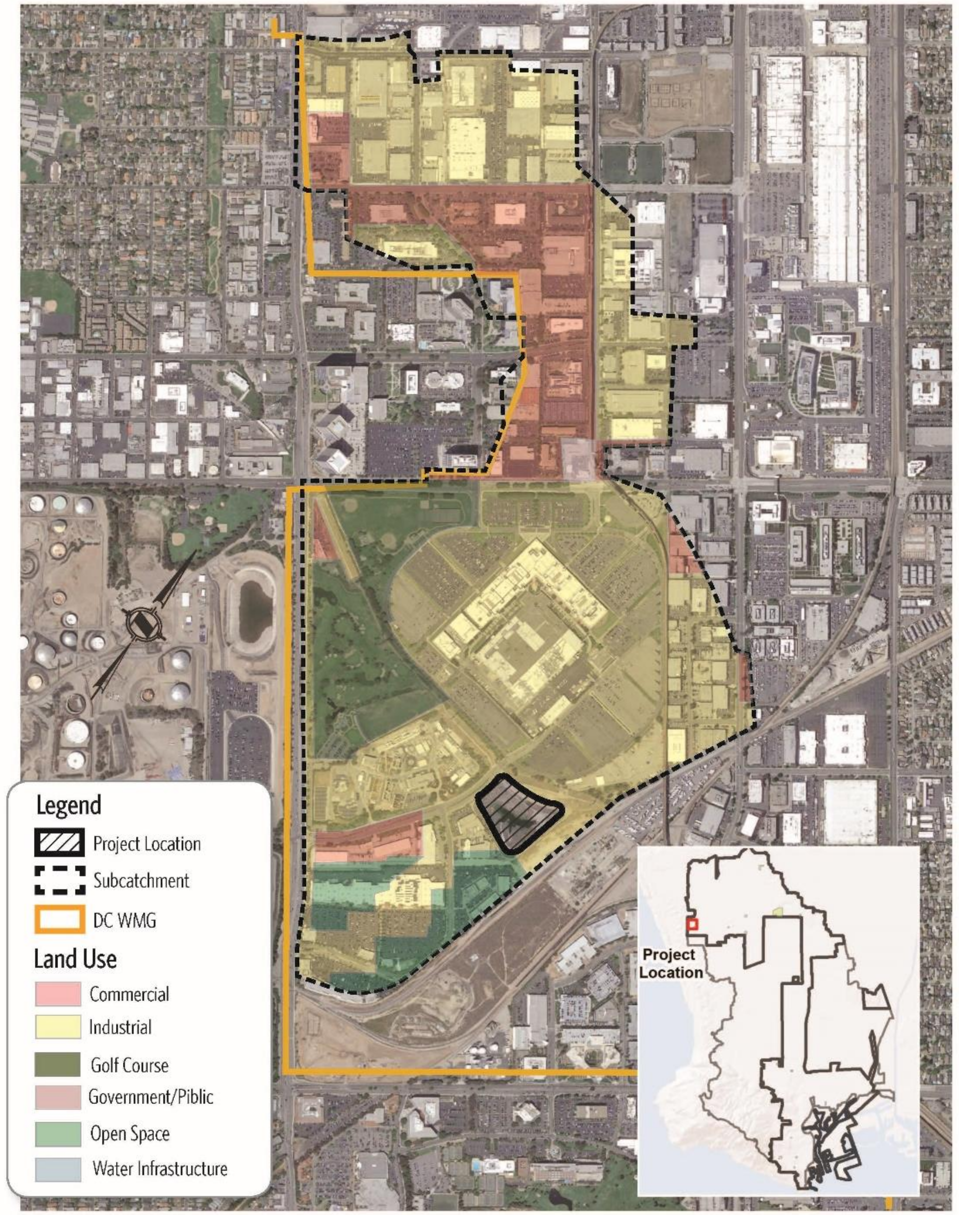
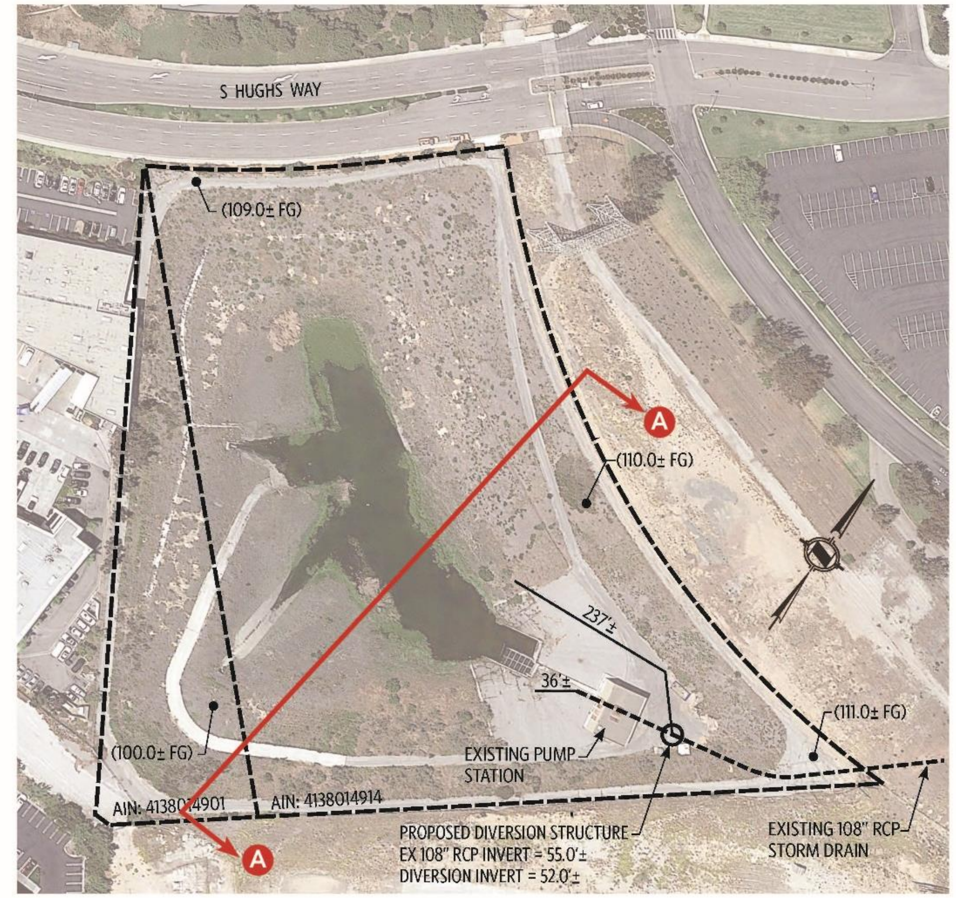


Figure 4-5: Chester Washington Golf Course





El Segundo Pump Station	
Item	**Detail**
Ownership	City of El Segundo
AIN	4138-014-901; 4138-014-914
Address	S Hughes Way and Allied Way, El Segundo, CA
Infiltration Rate (in/hr)	0.81
Groundwater Basin	West Coast
Site Area (acre)	7.39 (6.2 + 1.19)
Drainage Area (acre)	574
Design Volume (ac-ft)	27
Latitude and Longitude	33°54'29.96"N 118°23'23.34"W
Major Watershed/Tributary	Dominguez Channel
Existing Site Description	Open Space, Ex-Pump Station
Soil Type	Ramona Sandy Loam
Drainage Area Total Impervious (%)	70
Design Storm Event Rainfall Depth (in)	0.9
Proposed Retrofit Description	Re-grade for Better Infiltration
BMP Footprint (Square Feet)	112,817
Media Depth (Feet)	N/A
Construction Cost ($, millions)	1.4
Annual Maintenance Cost ($, millions)	0.016
Design and Construction Time	3.5
Completion Year	2026

NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

DOMINGUEZ CHANNEL WATERSHED EWMP
PRELIMINARY DESIGN CONCEPTS
El Segundo Pump Station Project Site

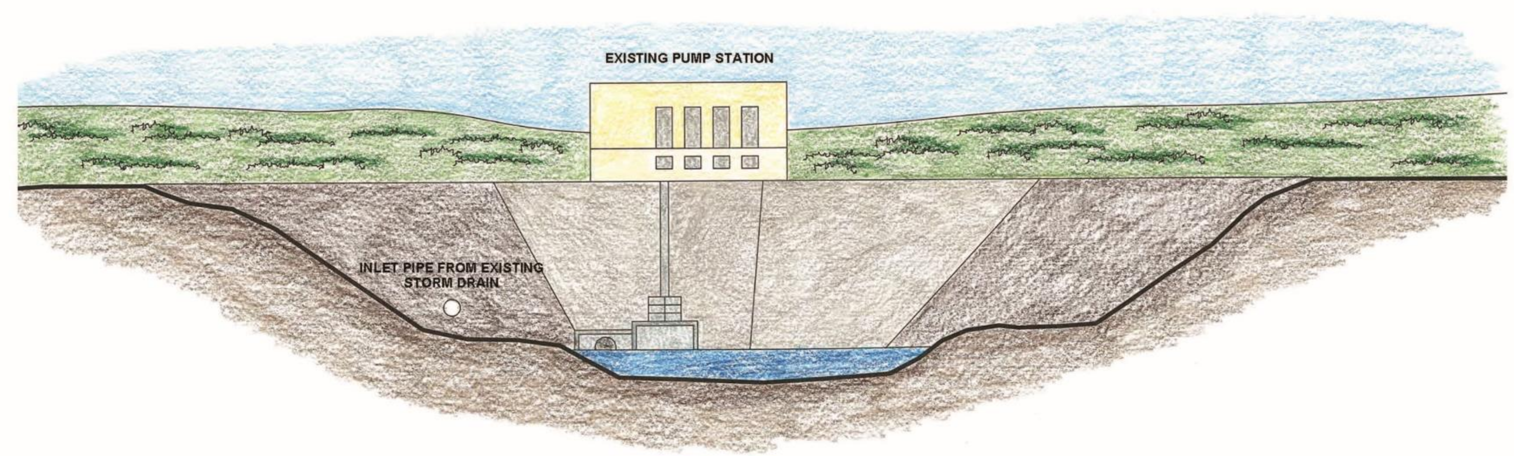
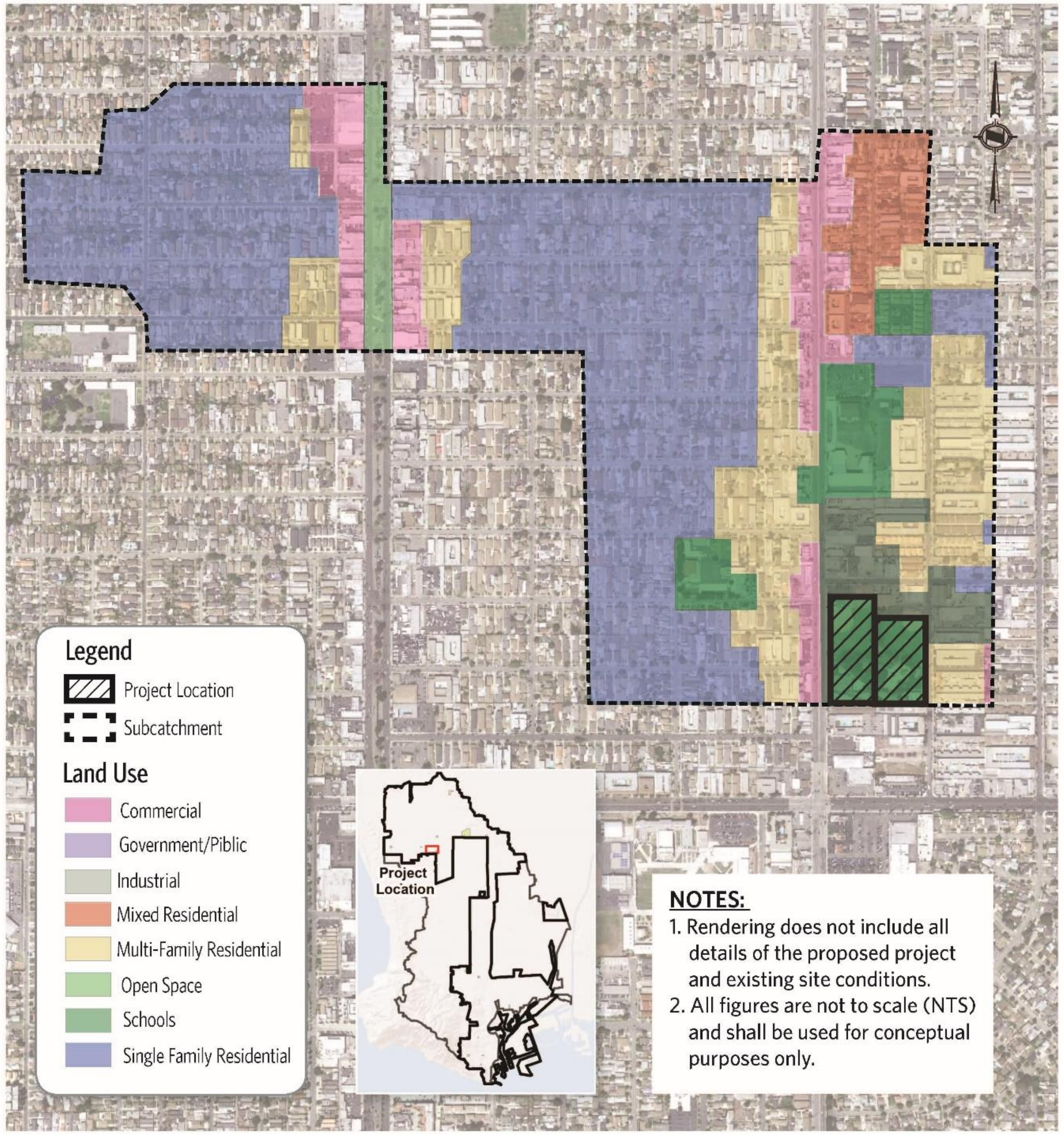
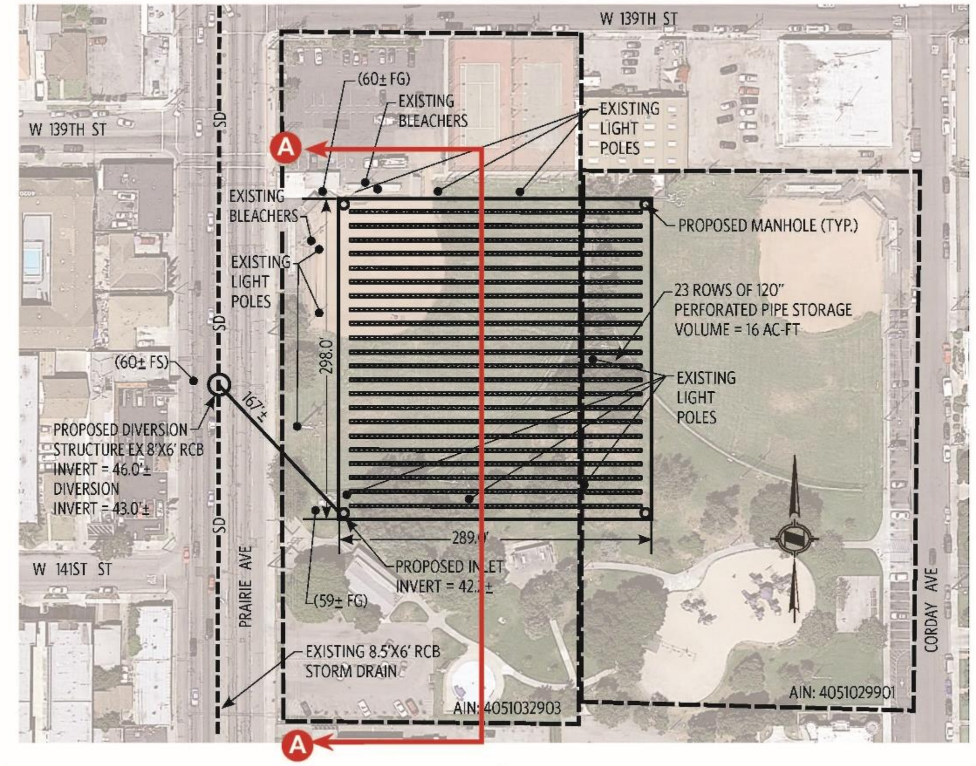


Figure 4-6: El Segundo Pump Station



NOTES:
1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.



Jim Thorpe Park	
Item	**Detail**
Ownership	City of Hawthorne
AIN	4051-032-903; 4051-029-901; 4051-030-901
Address	14100 Prairie Ave., Hawthorne, CA 90250
Infiltration Rate (in/hr)	0.27
Groundwater Basin	West Coast
Site Area (acre)	8.65(4.1 + 3.53 + 1.02)
Drainage Area (acre)	378
Design Volume (ac-ft)	16
Latitude and Longitude	33°54'16.09"N 118°20'34.20"W
Major Watershed/Tributary	Dominguez Channel

Jim Thorpe Park (cont'd)	
Item	**Detail**
Existing Site Description	Park, Open Space
Soil Type	Montezuma Clay Adobe
Drainage Area Total Impervious (%)	51
Design Storm Event Rainfall Depth (in)	0.95
Proposed Retrofit Description	23 Rows of 120" Perforated Pipe
BMP Footprint (Square Feet)	86,122
Media Depth (Feet)	28
Construction Cost ($, millions)	18.0
Annual Maintenance Cost ($, millions)	0.23
Design and Construction Time	4.5
Completion Year	2026

DOMINGUEZ CHANNEL WATERSHED EWMP
PRELIMINARY DESIGN CONCEPTS
Jim Thorpe Park Project Site

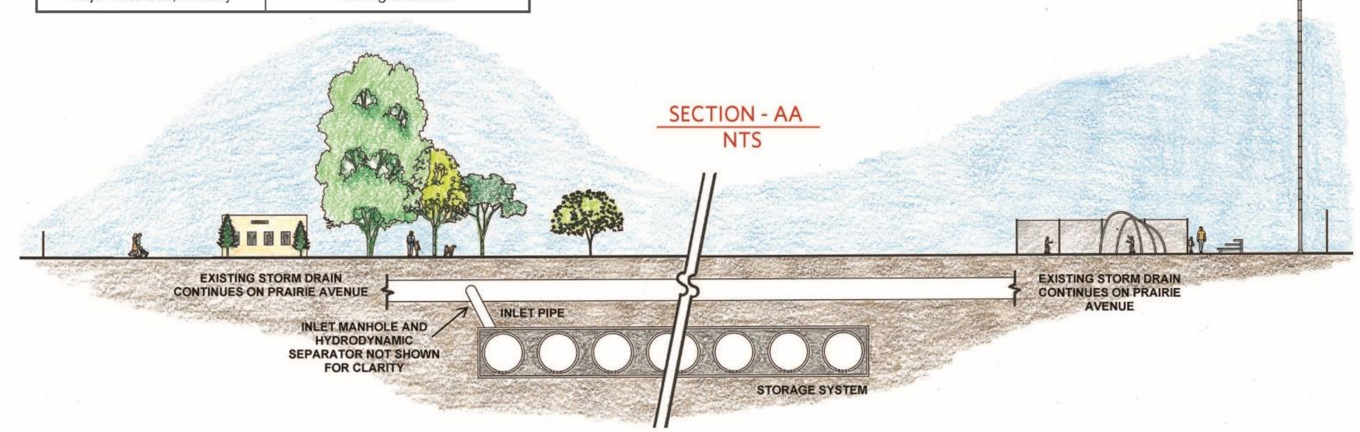
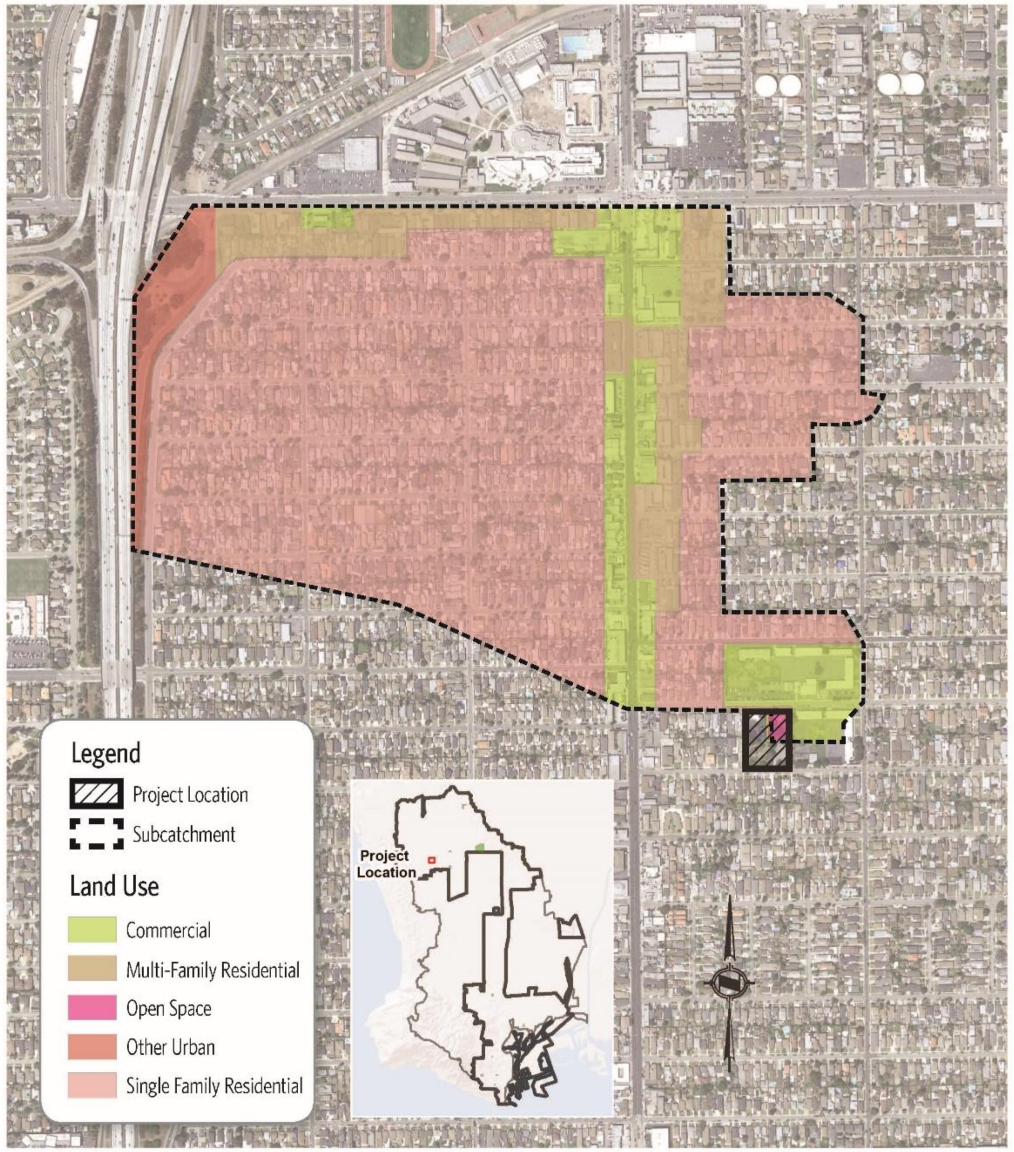
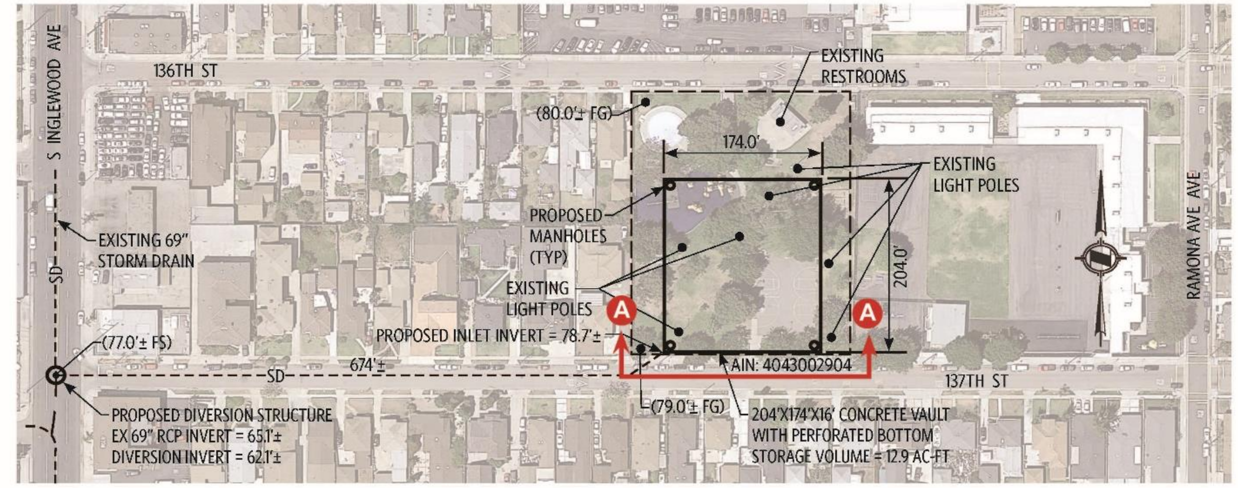


Figure 4-7: Jim Thorpe Park





Ramona Park	
Item	**Detail**
Ownership	City of Hawthorne
AIN	4043-002-904
Address	4662 W 136th St., Hawthorne CA 90250
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast
Site Area (acre)	1.7
Drainage Area (acre)	273
Design Volume (ac-ft)	12.9
Latitude and Longitude	33°54'30.30"N 118°21'31.86"W
Major Watershed/Tributary	Dominguez Channel

Ramona Park (cont'd)	
Item	**Detail**
Existing Site Description	Park, Including Restrooms
Soil Type	Montezuma Clay Adobe
Drainage Area Total Impervious (%)	10
Design Storm Event Rainfall Depth (in)	0.95
Proposed Retrofit Description	Concrete Vault with Perforated Bottom
BMP Footprint (Square Feet)	35,496
Media Depth (Feet)	40
Construction Cost ($, millions)	20.8
Annual Maintenance Cost ($, millions)	0.264
Design and Construction Time	5.5
Completion Year	2026

NOTES:

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2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

DOMINGUEZ CHANNEL WATERSHED EWMP

PRELIMINARY DESIGN CONCEPTS

Ramona Park Project Site

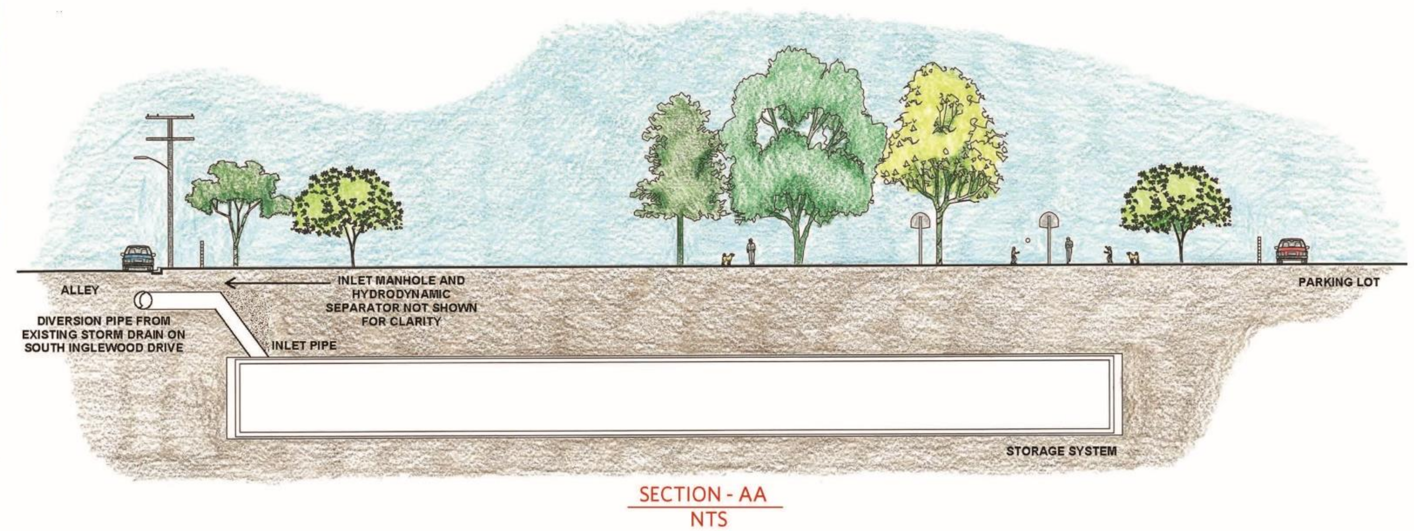
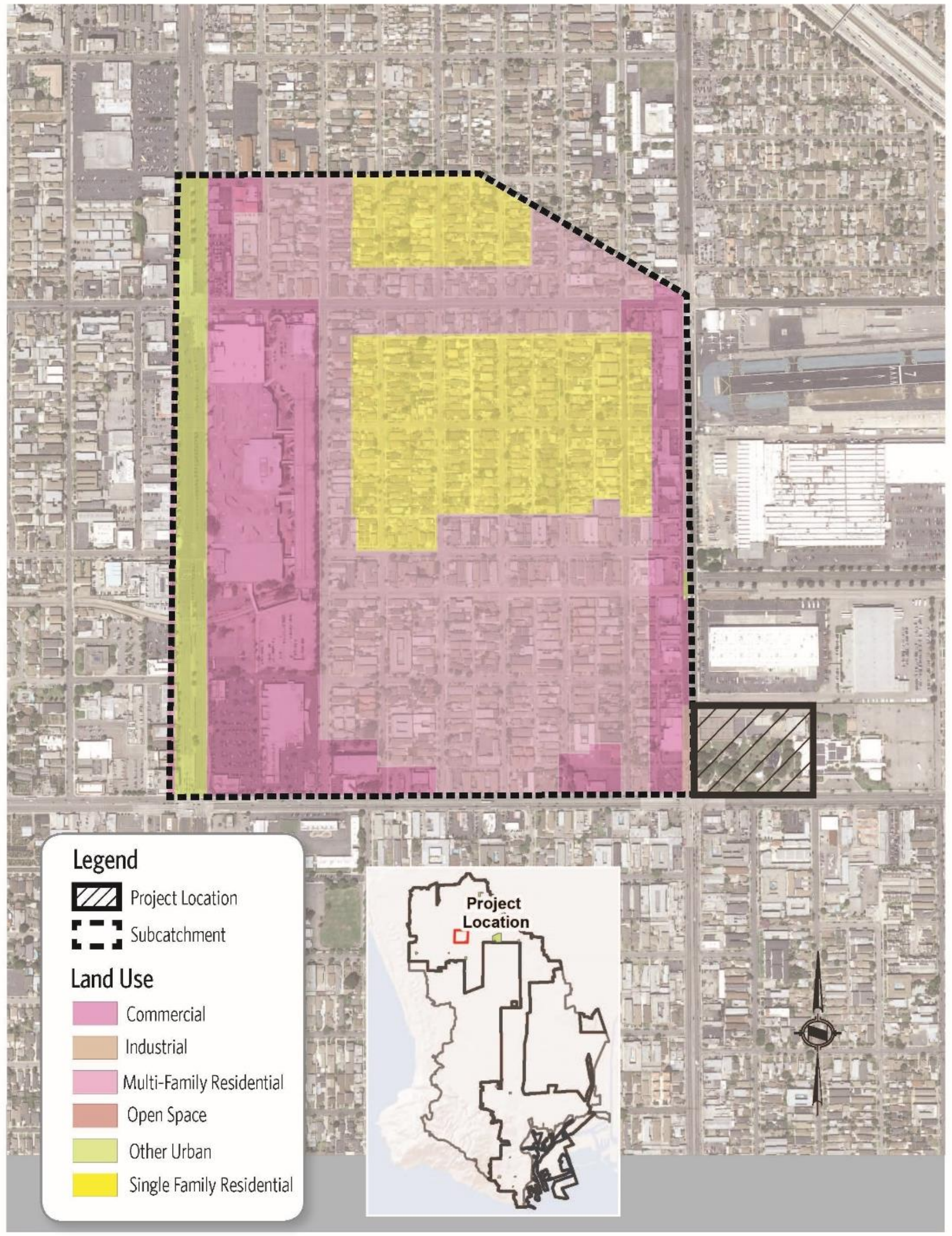
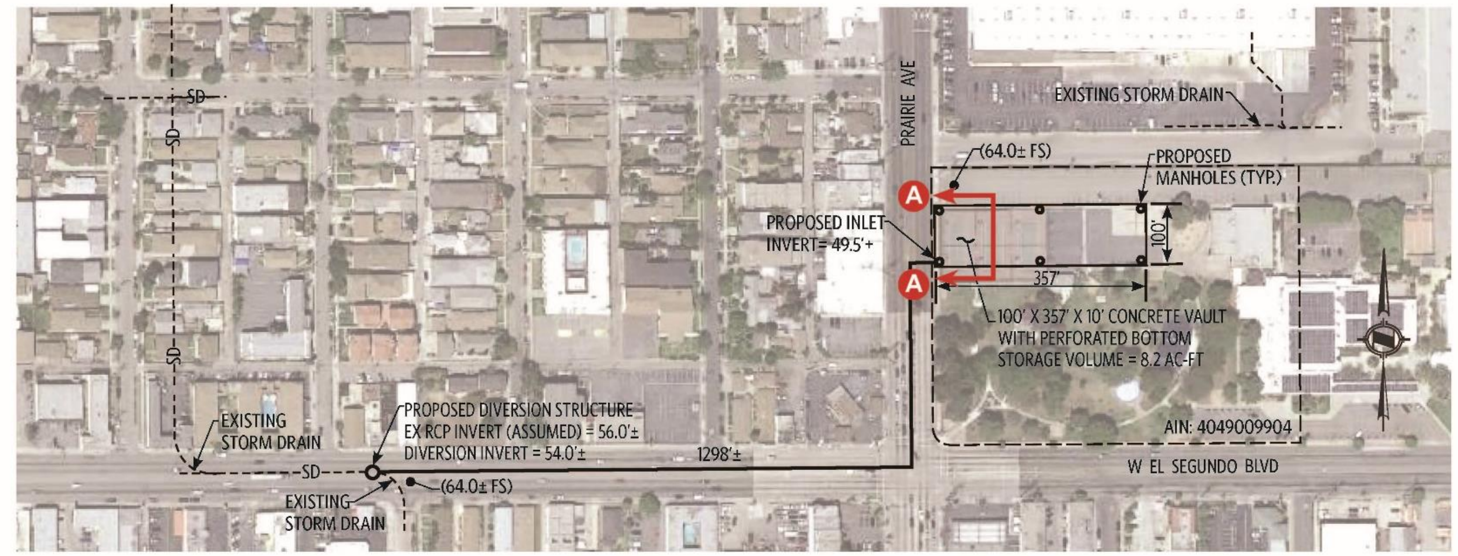


Figure 4-8: Ramona Park



DOMINGUEZ CHANNEL WATERSHED EWMP
PRELIMINARY DESIGN CONCEPTS
Hawthorne Memorial Park Project Site



Hawthorne Memorial Park	
Item	**Detail**
Ownership	City of Hawthorne
AIN	4049-009-904
Address	3901 W El Segundo Blvd., Hawthorne, CA 90250
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast Basin
Site Area (acre)	6.59
Drainage Area (acre)	202
Design Volume (ac-ft)	11.3
Latitude and Longitude	33°55'2.27"N 118°20'34.34"W
Major Watershed/Tributary	Dominguez Channel

Hawthorne Memorial Park (cont'd)	
Item	**Detail**
Existing Site Description	Park
Soil Type	Ramona Loam
Drainage Area Total Impervious (%)	51
Design Storm Event Rainfall Depth (in)	0.67
Proposed Retrofit Description	Concrete Vault with Perforated Bottom
BMP Footprint (Square Feet)	33,775
Media Depth (Feet)	33
Construction Cost ($, millions)	8.9
Annual Maintenance Cost ($, millions)	0.112
Design and Construction Time	4.5
Completion Year	2026

NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

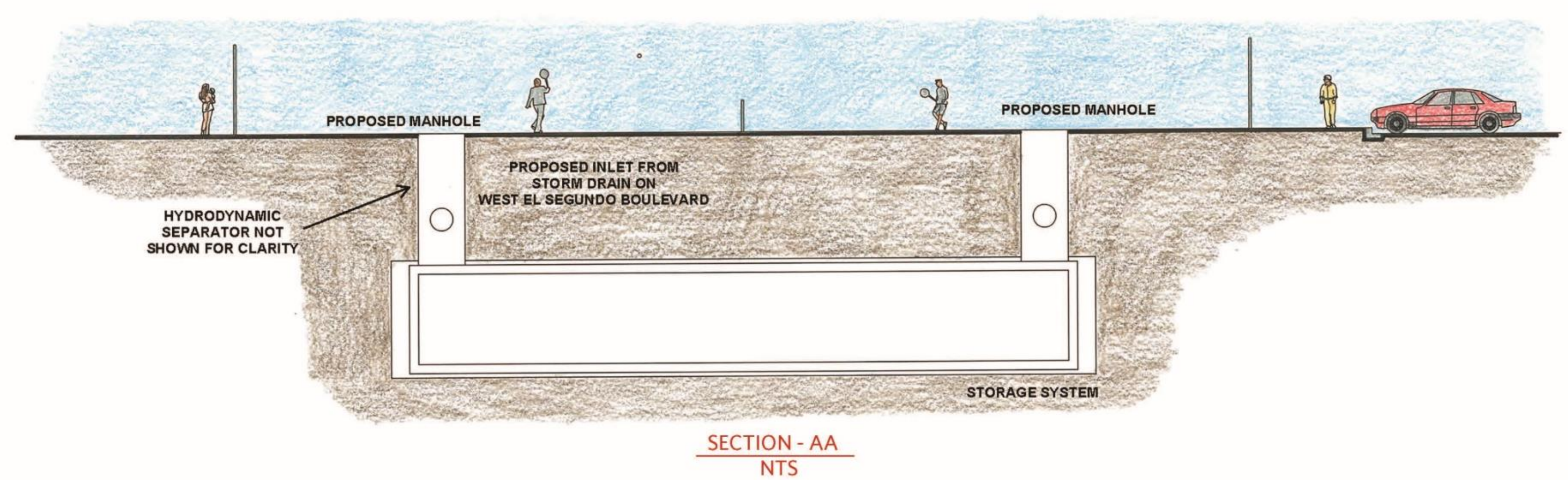
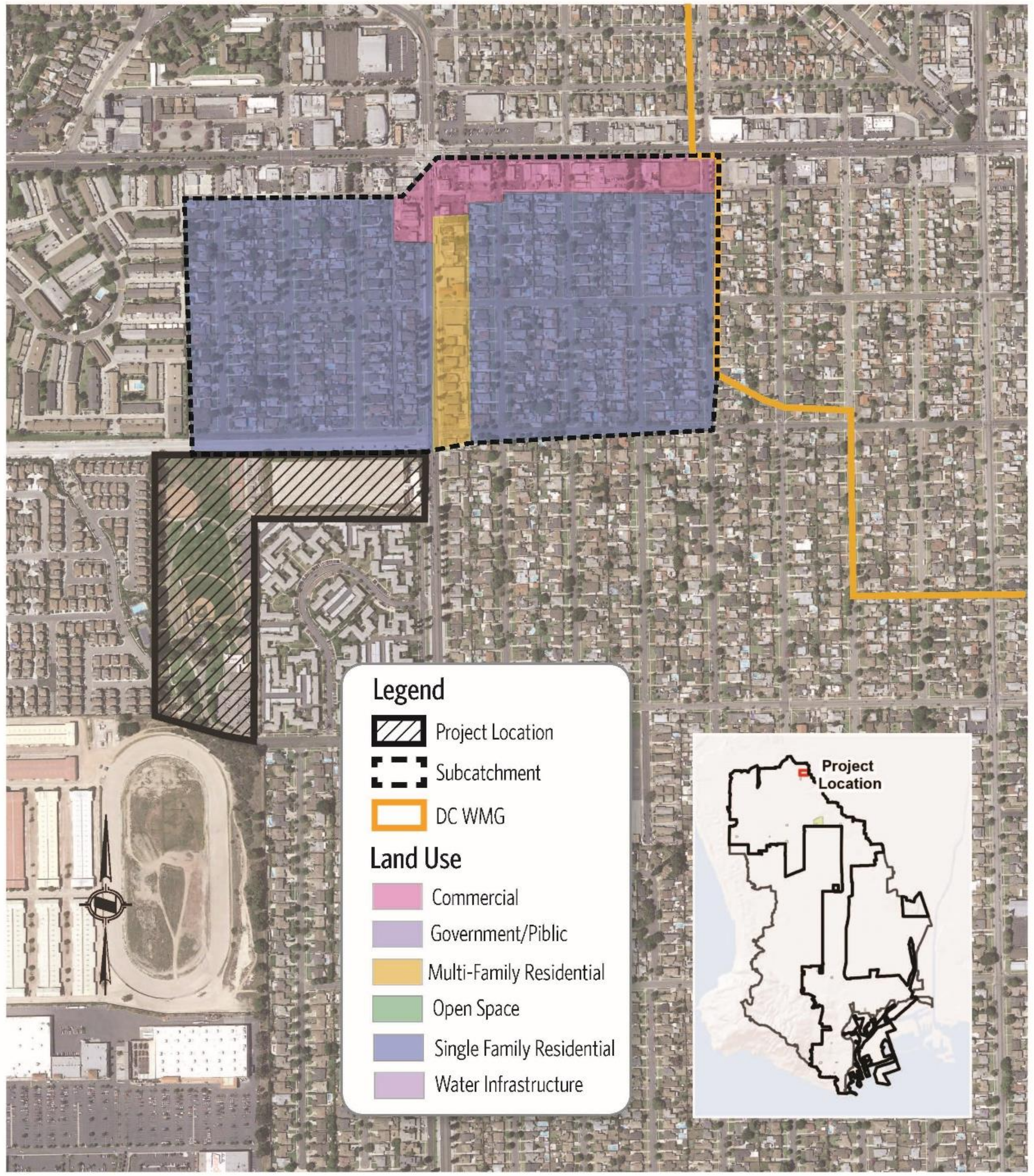
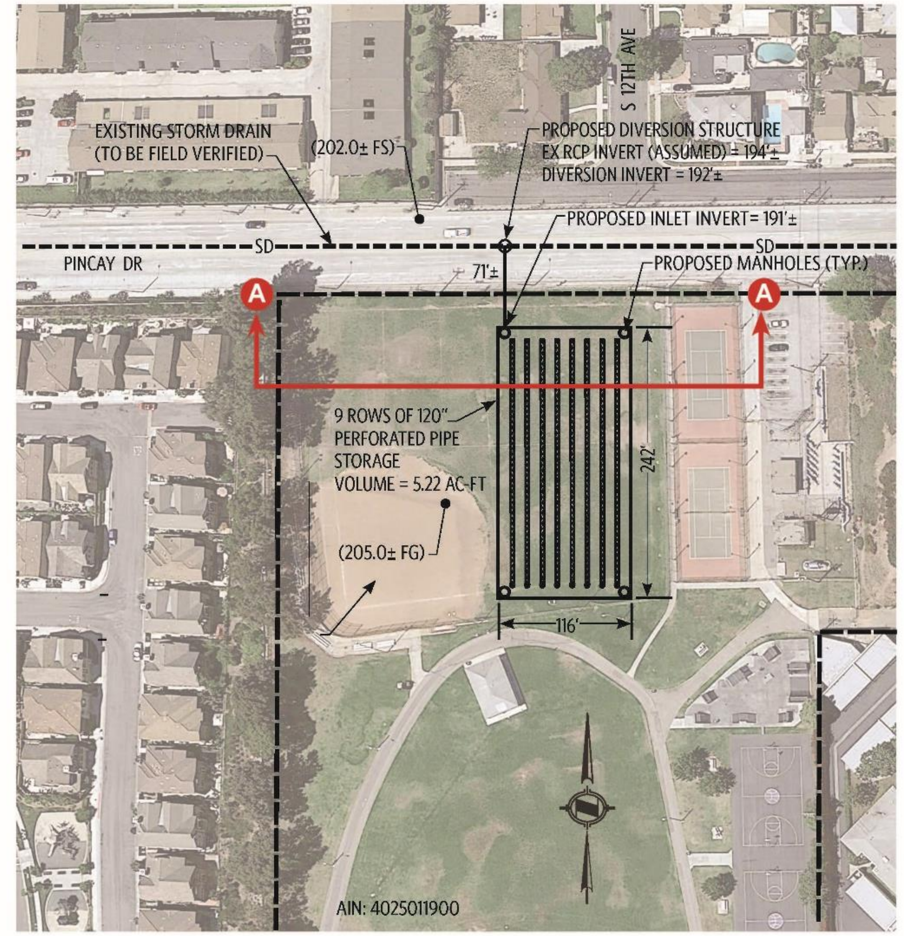


Figure 4-9: Hawthorne Memorial Park

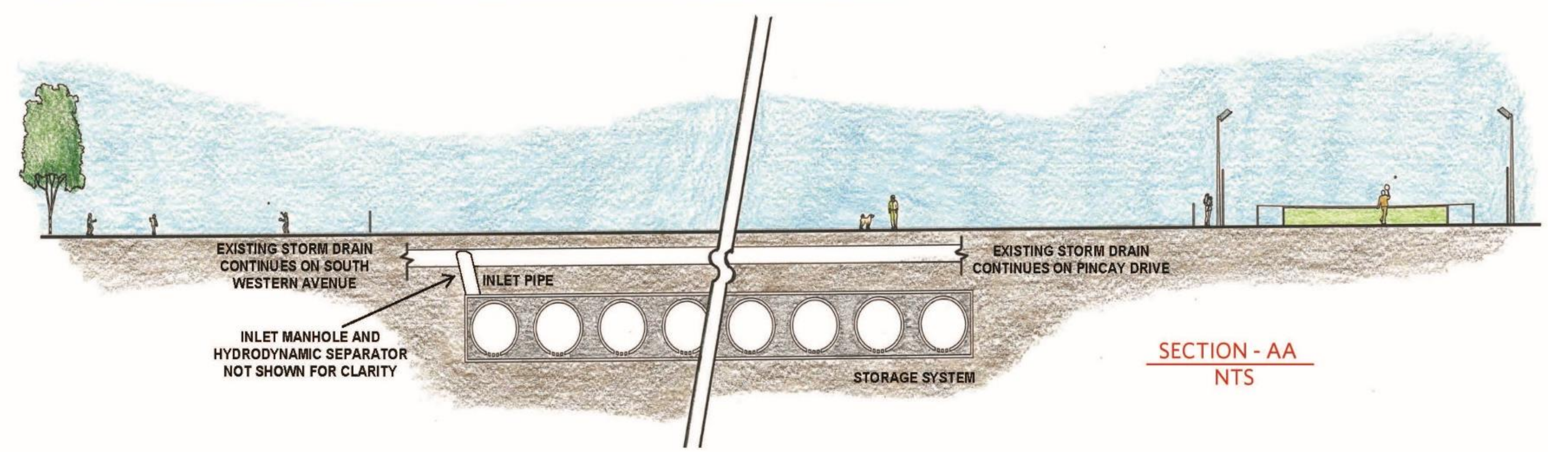




Darby Park	
Item	**Detail**
Ownership	City of Inglewood
AIN	4025-011-900
Address	3400 W Arbor Vitae St., Ingelwood, CA 90305
Infiltration Rate (in/hr)	0.45
Groundwater Basin	Central
Site Area (acre)	19.3
Drainage Area (acre)	106
Design Volume (ac-ft)	5.2
Latitude and Longitude	33°57'19.83"N 118°19'49.34"W
Major Watershed/Tributary	Dominguez Channel
Existing Site Description	Park, Open Space
Soil Type	Ramona Loam
Drainage Area Total Impervious (%)	62
Design Storm Event Rainfall Depth (in)	0.59
Proposed Retrofit Description	9 Rows of 120" Perforated Pipe
BMP Footprint (Square Feet)	28,072
Media Depth (Feet)	22
Construction Cost ($, millions)	5.9
Annual Maintenance Cost ($, millions)	0.074
Design and Construction Time	3.5
Completion Year	2026

NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

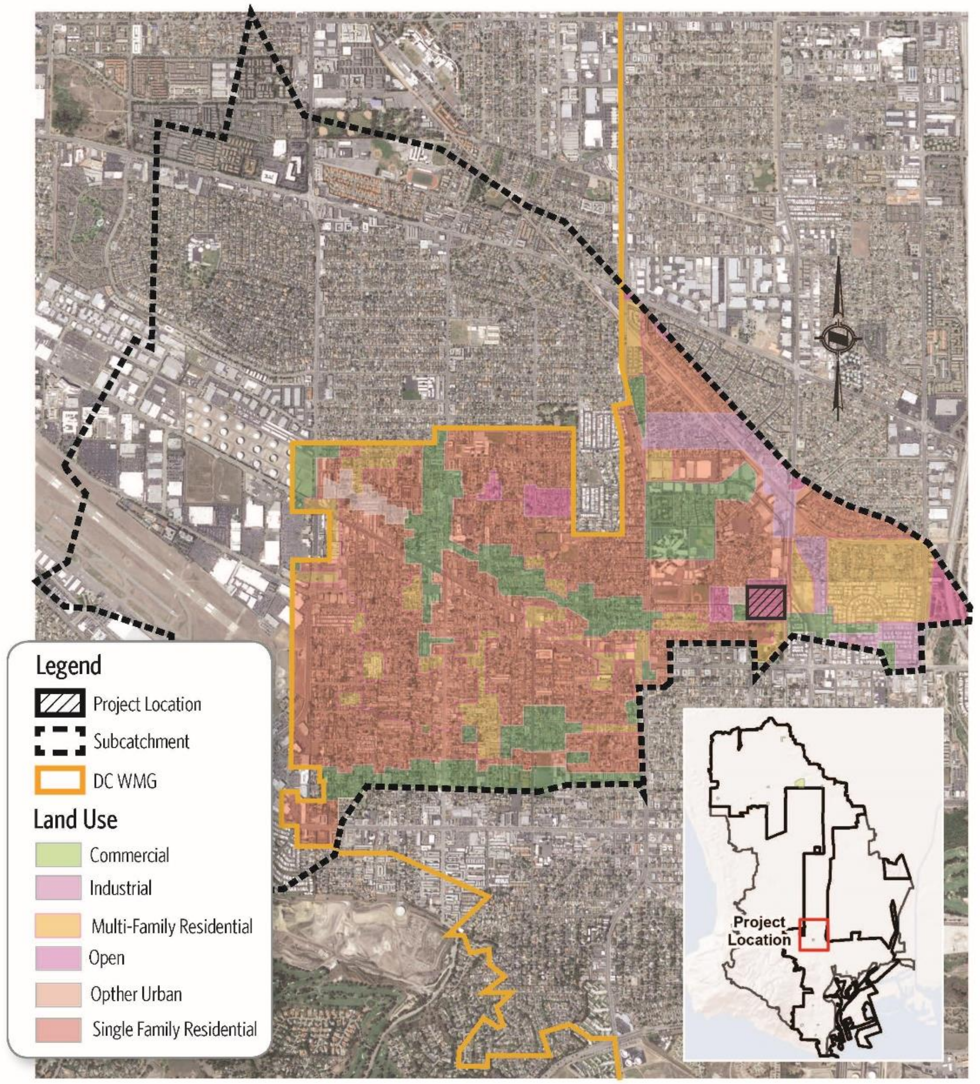


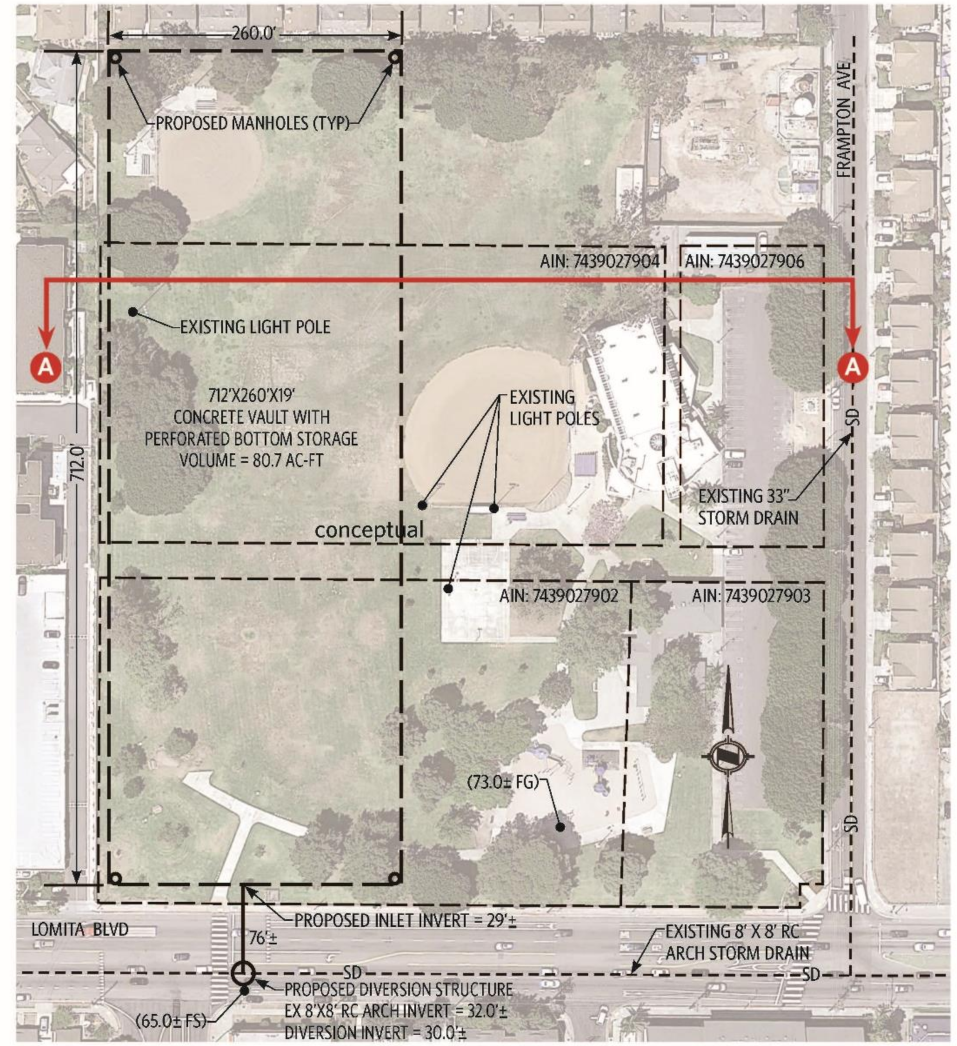
DOMINGUEZ CHANNEL WATERSHED EWMP

PRELIMINARY DESIGN CONCEPTS

Darby Park Project Site

Figure 4-10: Darby Park





Harbor City Park	
Item	**Detail**
Ownership	City of Los Angeles
AIN	7439-027-900, 7439-027-902, 7439-027-903; 7439-027-904, 7439-027-905; 7439-027-906 (Harbor City Park)
Address	24901 Frampton Ave., Los Angeles, CA 90710
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast
Site Area (acre)	7.62 (2.97 + 1.1 + 2.8 + 0.75)
Drainage Area (acre)	4,460 (Total Catchment, 2,230 Diverted)
Design Volume (ac-ft)	77
Latitude and Longitude	33°47'56.79"N 118°18'1.35"W
Major Watershed/Tributary	Machado Lake
Existing Site Description	Park, Open Space
Soil Type	Ramona Loam
Drainage Area Total Impervious (%)	64
Design Storm Event Rainfall Depth (in)	0.85
Proposed Retrofit Description	Concrete Vault with Perforated Bottom
BMP Footprint (Square Feet)	185,120
Media Depth (Feet)	34
Construction Cost ($, millions)	85
Annual Maintenance Cost ($, millions)	0.5
Design and Construction Time	7.5
Completion Year	2034

NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

DOMINGUEZ CHANNEL WATERSHED EWMP

PRELIMINARY DESIGN CONCEPTS

Harbor City Park Project Site

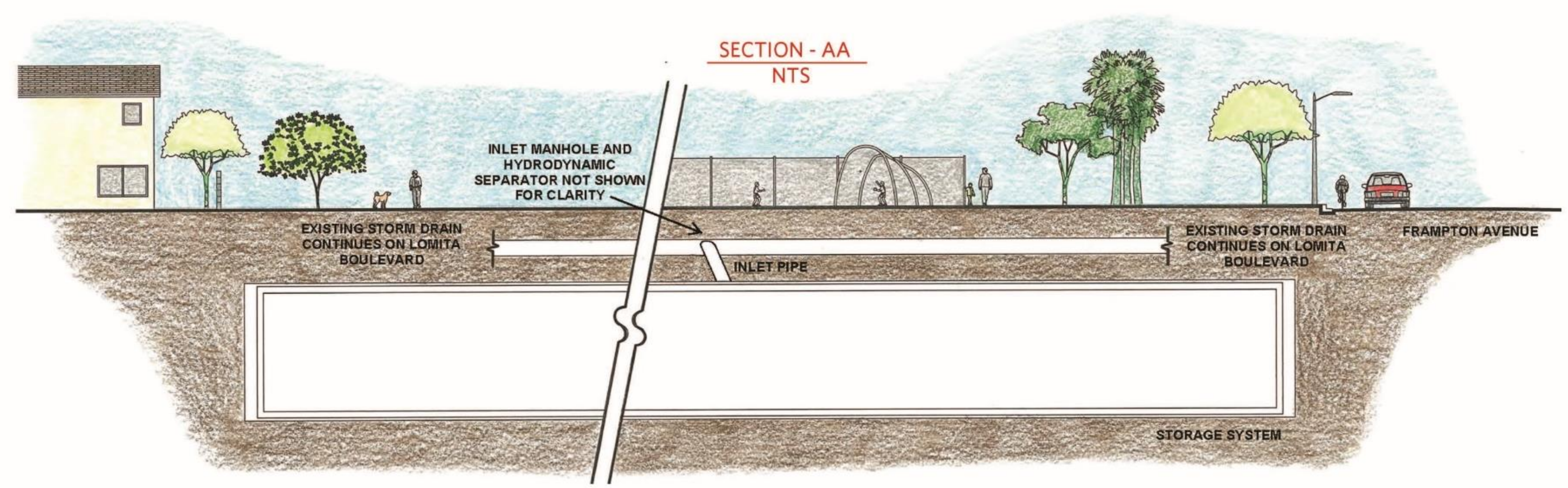
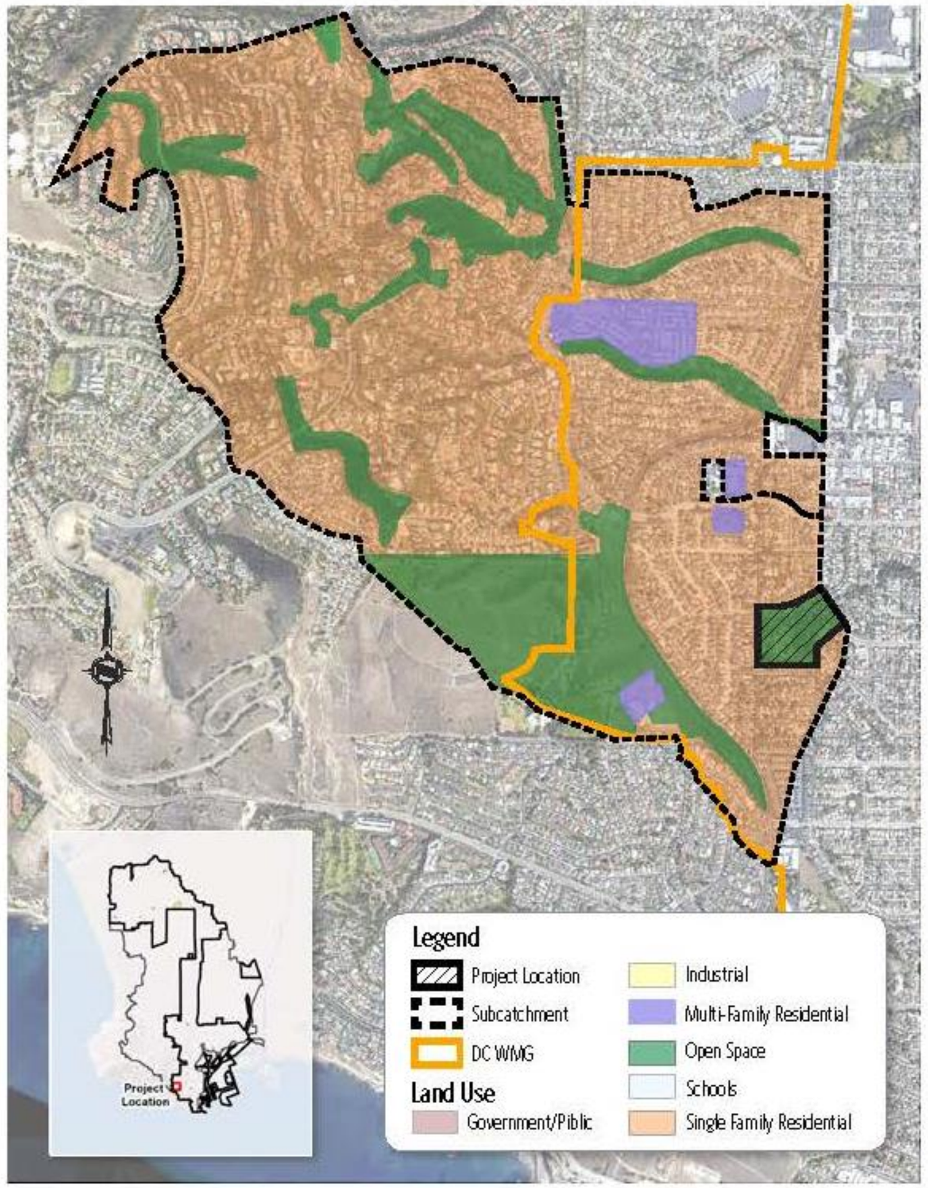
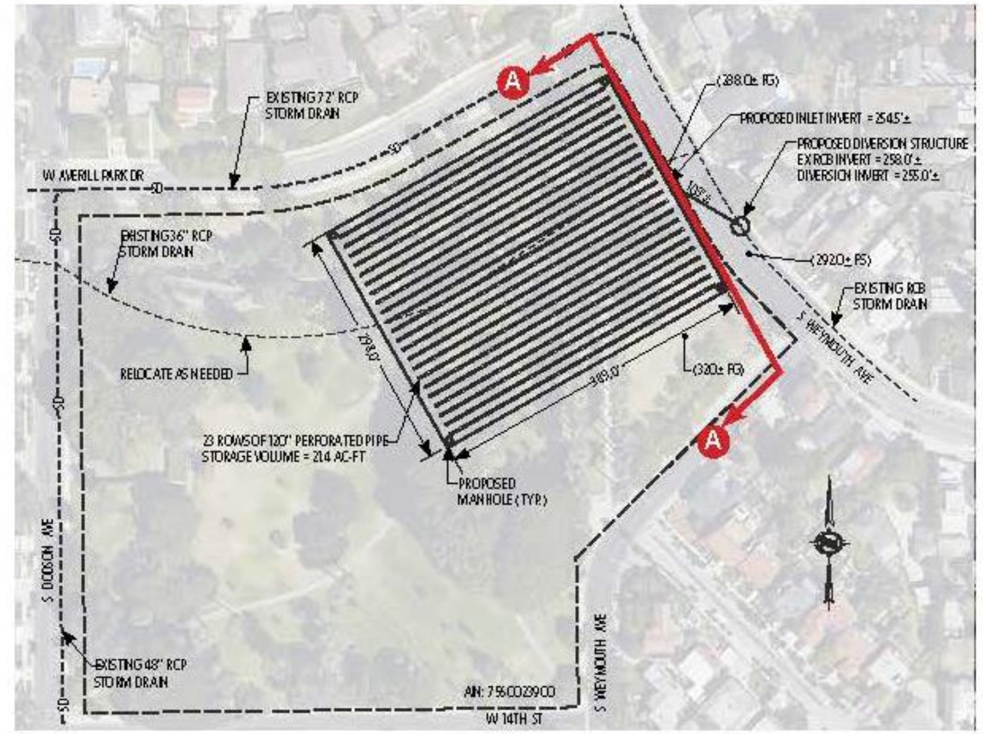
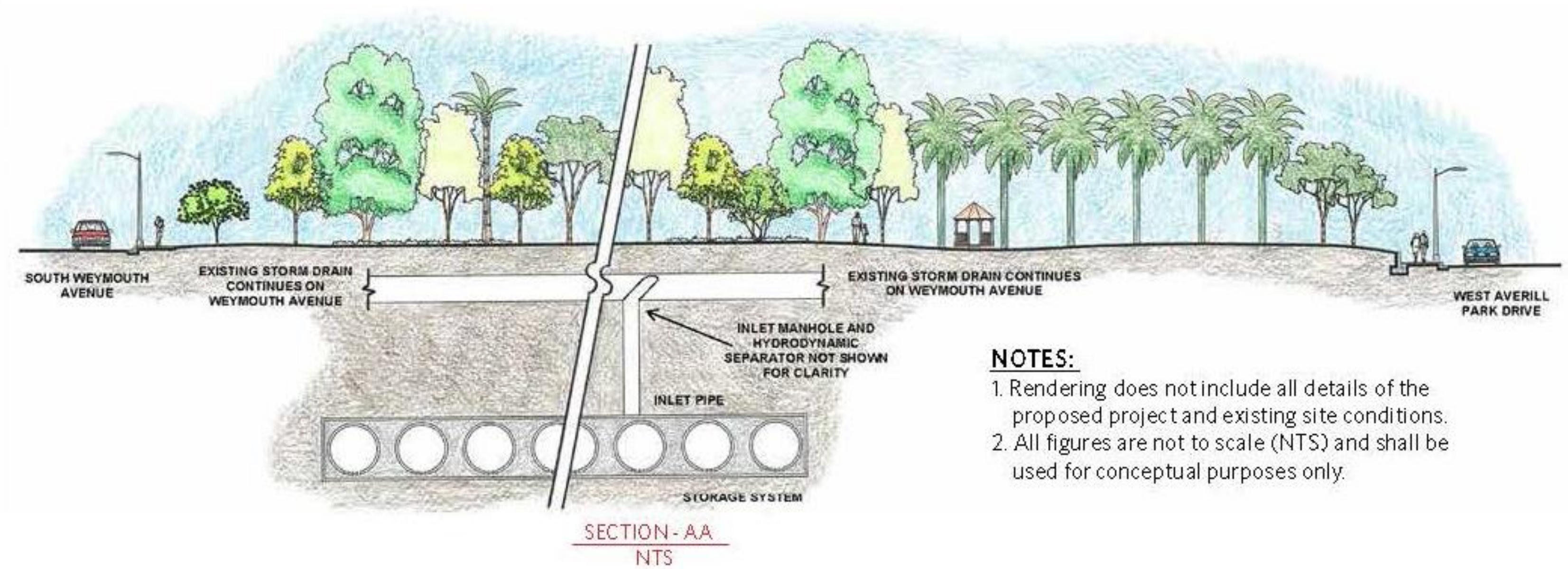


Figure 4-11: Harbor City Park





Averill Park	
Item	**Detail**
Ownership	City of Los Angeles
AIN	7560-023-900
Address	1300 S Dodson Ave., San Pedro, CA 90732
Infiltration Rate (in/hr)	0.4
Groundwater Basin	West Coast
Site Area (acre)	10.7
Drainage Area (acre)	1,376
Design Volume (ac-ft)	21.4
Latitude and Longitude	33°43'57.55"N 118°18'37.84"W
Major Watershed/Tributary	Los Angeles/Long Beach Harbor
Existing Site Description	Park, Open Space
Soil Type	Diablo Clay Loam
Drainage Area Total Impervious (%)	10
Design Storm Event Rainfall Depth (in)	0.19
Proposed Retrofit Description	23 Rows of 120" Perforated Pipe
BMP Footprint (Square Feet)	15,922
Media Depth (Feet)	44
Construction Cost ($, millions)	25.5
Annual Maintenance Cost ($, millions)	0.324
Design and Construction Time	5.5
Completion Year	2026

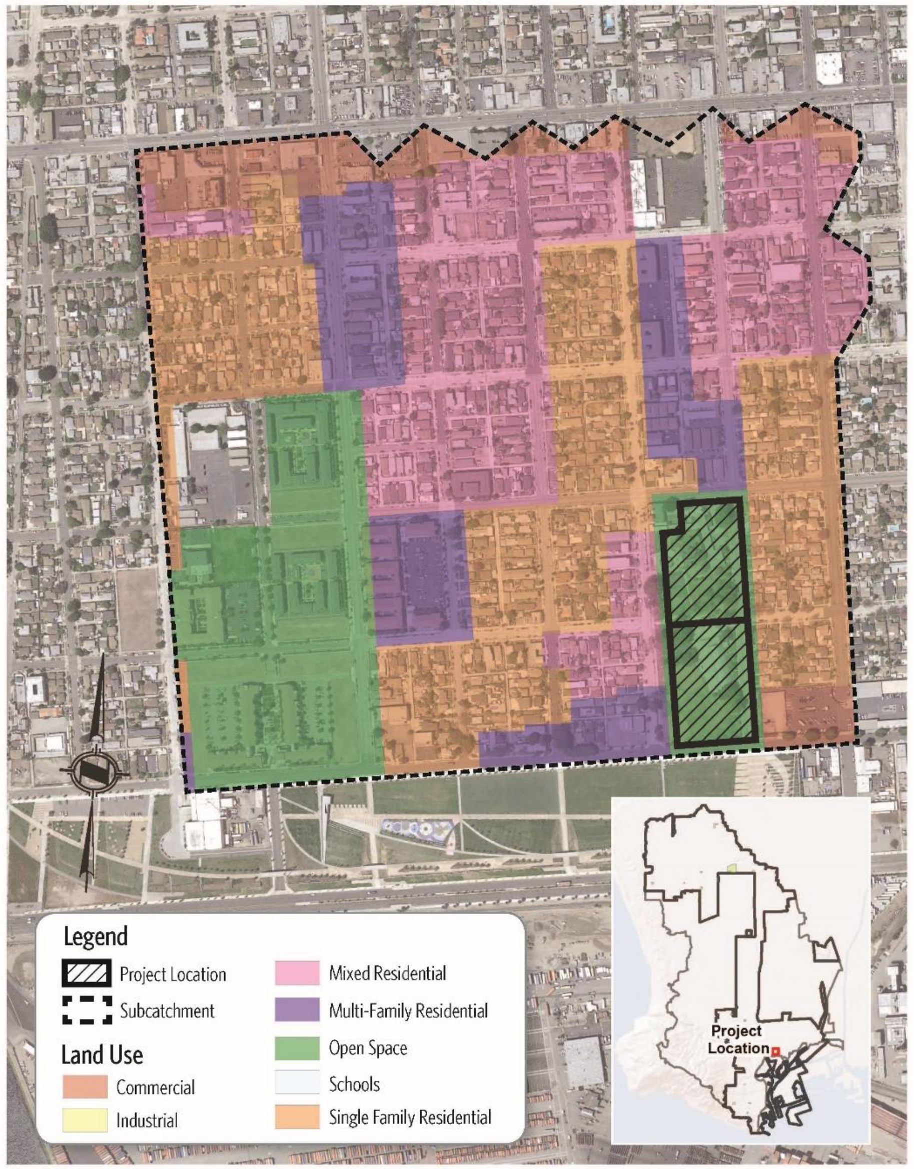


NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

DOMINGUEZ CHANNEL WATERSHED EWMP
PRELIMINARY DESIGN CONCEPTS
Averill Park Project Site

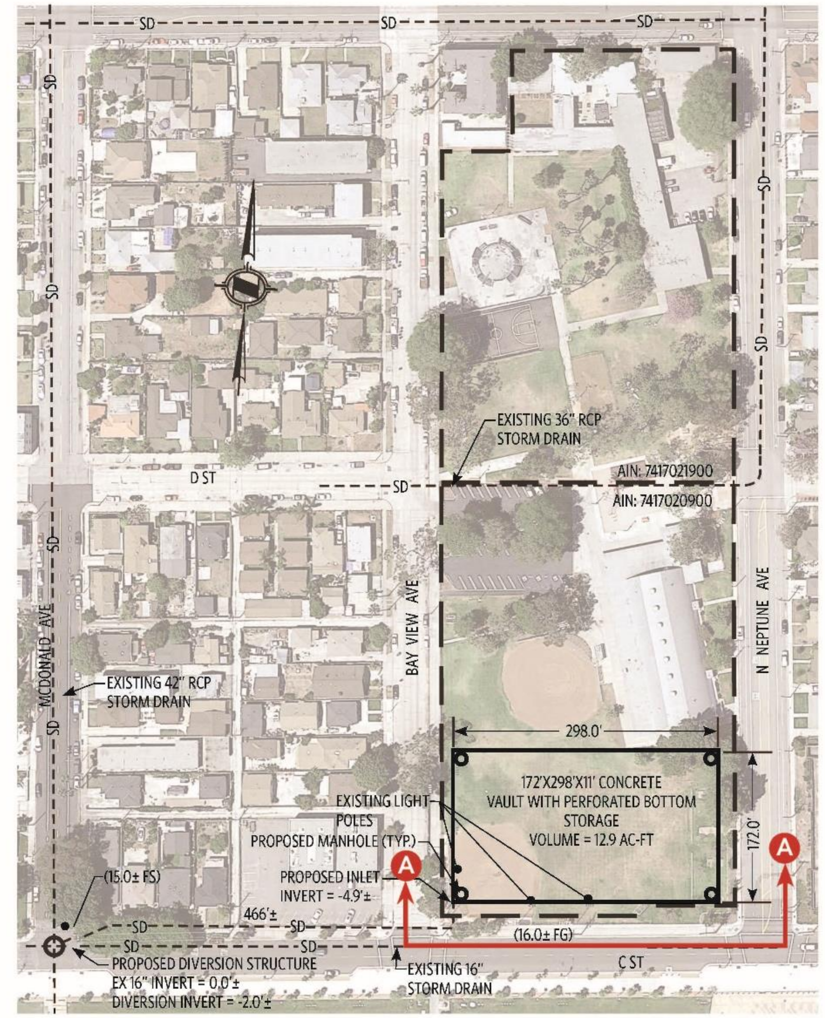
Figure 4-12: Averill Park



DOMINGUEZ CHANNEL WATERSHED EWMP

PRELIMINARY DESIGN CONCEPTS

Wilmington Recreation Center Project Site



Wilmington Recreation Center

Item	Detail
Ownership	City of Los Angeles
AIN	7417-020-900; 7417-021-900
Address	325 N Neptune Ave., Wilmington, CA 90744
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast
Site Area (acre)	3(3.76 + 3.55)
Drainage Area (acre)	273
Design Volume (ac-ft)	12.9
Latitude and Longitude	33°46'22.40"N 118°16'8.58"W
Major Watershed/Tributary	Los Angeles/Long Beach Harbor
Existing Site Description	Open Space at Recreation Center
Soil Type	Chino Silt Loam, Ramona Sandy Loam
Drainage Area Total Impervious (%)	10
Design Storm Event Rainfall Depth (in)	0.65
Proposed Retrofit Description	Concrete Vault with Perforated Bottom
BMP Footprint (Square Feet)	51,256
Media Depth (Feet)	35
Construction Cost ($, millions)	14.4
Annual Maintenance Cost ($, millions)	0.184
Design and Construction Time	4.5
Completion Year	2026

NOTES:

1. Rendering does not include all details of the proposed project and existing site conditions.
2. All figures are not to scale (NTS) and shall be used for conceptual purposes only.

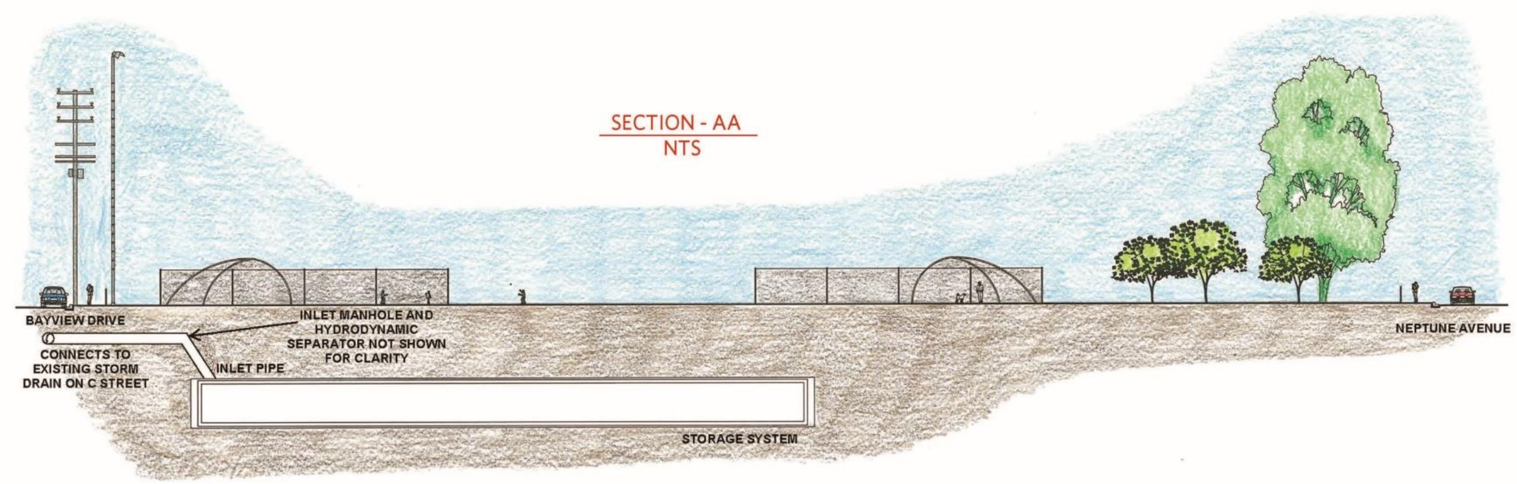


Figure 4-13: Wilmington Recreation Center

DESIGN CONSIDERATIONS FOR REGIONAL STORMWATER CAPTURE

BMP Concept Description:

The proposed concept for the Carriage Crest regional BMP consists of an offline infiltration gallery below the ballfield of Carriage Crest Park. The gallery would consist of either a 255' by 240' by 6.5' concrete chamber or twenty 255' rows of 120" corrugated metal pipe. For the wet weather capture area, stormwater would be diverted from the existing 69" drain in the northern section of the park to treat the 85th percentile, 24-hour runoff volume. For the dry weather capture area, a second diversion from the existing double 129" x 79" concrete box drain under South Figueroa Street will be considered to treat dry weather flows of up to 2 cubic feet per second (cfs). Diversion structures are required – the wet weather diversion would be sized to handle the peak design storm flow rate (approximately 14 cfs) and the dry weather diversion would be sized to handle the peak dry weather flow rate (less than 2 cfs). Due to relatively low invert elevation of the existing storm drains (approximately 9 feet below ground surface), pumping may be required to lift the water to the BMP, but will be subject to a geotechnical site investigation.

DISCLAIMER: All elements of this conceptual design are planning-level, based on desktop analysis. All assumptions and design parameters must be re-evaluated during the detailed design process.

Multiple Benefits:	Considerations:
Flood control, groundwater recharge, pollutant load reductions, park enhancements	Existing ball diamond, tree removal/ relocation, existing utilities

Design Criteria	
Wet Weather Sizing Criteria	85th percentile, 24 hour storm event
Dry Weather Sizing Criteria	2 cfs, steady flow (subject to field study)
85th percentile, 24-hr precipitation (in)	0.89
Infiltration Rate (in/hr)	0.58
Wet Weather Capture Volume (ac-ft)	8.5
Dry Weather Capture Volume (ac-ft)	2
Volume infiltrated during 24-hr storm (ac-ft)	1.5
Peak Discharge, 85th percentile 24-hr storm (cfs)	12.9

BMP Characteristics	
BMP Type	Underground Infiltration Gallery
BMP Footprint (acres)	1.4
Design Volume (ac-ft)*	9
Required BMP Height (ft)	6.5 (Concrete Chamber) / 10 (Pipe)
Diversion Structures	Required
Pump Structure	Subject to geotechnical investigation

* Design volume takes into account infiltration, dry weather flow, and 85th percentile capture volume

Regional BMP Concept Design for City of Carson
Carriage Crest Park

PARADIGM ENVIRONMENTAL

Figure 4-14: Carriage Crest Park

4.2.5 Distributed Projects (Green Streets)

The Permit specifies that EWMPs should "incorporate effective technologies, approaches and practices, including green infrastructure." Rights-of-way along streets may be the most extensive opportunity for the DC WMG to implement green infrastructure on public land. In developed areas, curb and gutter in the road provides the primary means of conveying stormwater (and associated pollutants) directly to storm drain inlets and receiving waters. Green streets provide an opportunity to intercept this runoff prior to entering the MS4 and treat it within the public right-of-way. Green streets are typically implemented as linear bioretention/biofiltration practices installed parallel to roadways. Systems receive runoff from the gutter via curb cuts or curb extensions (sometimes called bump outs) and infiltrate it through native or engineered soil media. Permeable pavement can also be implemented in tandem, or as a standalone practice, in parking lanes of roads.

Green streets have been demonstrated to provide "complete streets" benefits in addition to stormwater management, including pedestrian safety and traffic calming, street tree canopy and heat island effect mitigation, increased property values, and even reduced crime rates. As with LID, green streets tend to be distributed practices that are deployed throughout a watershed to treat runoff near the source. Key advantages of green streets, however, are that they are located on land directly controlled by public entities and can intercept runoff from larger upstream drainage areas when compared to LID projects.

A green streets analysis was performed for the entire DC WMG area to estimate which streets are most suitable for green street implementation. The analysis considered land characteristics such as slope, soil infiltration capacity, and street type to identify and rank those streets that represent opportunities for green street retrofits. Attachment R summarizes the process for the green streets analysis. Based on this analysis, Figure 4-15 shows the opportunities for green streets within the DC WMG area.

The green street opportunities depicted in Figure 4-15 were used within the RAA to determine the most cost-effective combination of distributed and regional projects within each WMG member's jurisdiction to provide necessary pollutant reductions to meet WQBELs and RWLs.[10] Although opportunities for green streets were identified within the Port of Los Angeles based on the coarse GIS screening analysis, it was determined that the Port's areas are not conducive to green street implementation due to the use and traffic of the streets. There are many substitutive opportunities underway which are established through the Port's parallel planning efforts to assess pollutant sources and implement other distributed BMPs within those areas (see Section 4.2.7). Based on modeling performed in the RAA, the EWMP Implementation Plan (Section 5) reports the resulting selection of the amount of green streets within each WMG member jurisdiction.

[10] The Cities of Carson and Lawndale were not included within this analysis as those cities were added to the DC EWMP at a later time (August 2015) within the planning process. See Attachments Z and AA for more information on the inclusion of Carson and Lawndale within the DC EWMP, including opportunities for green streets within those cities.

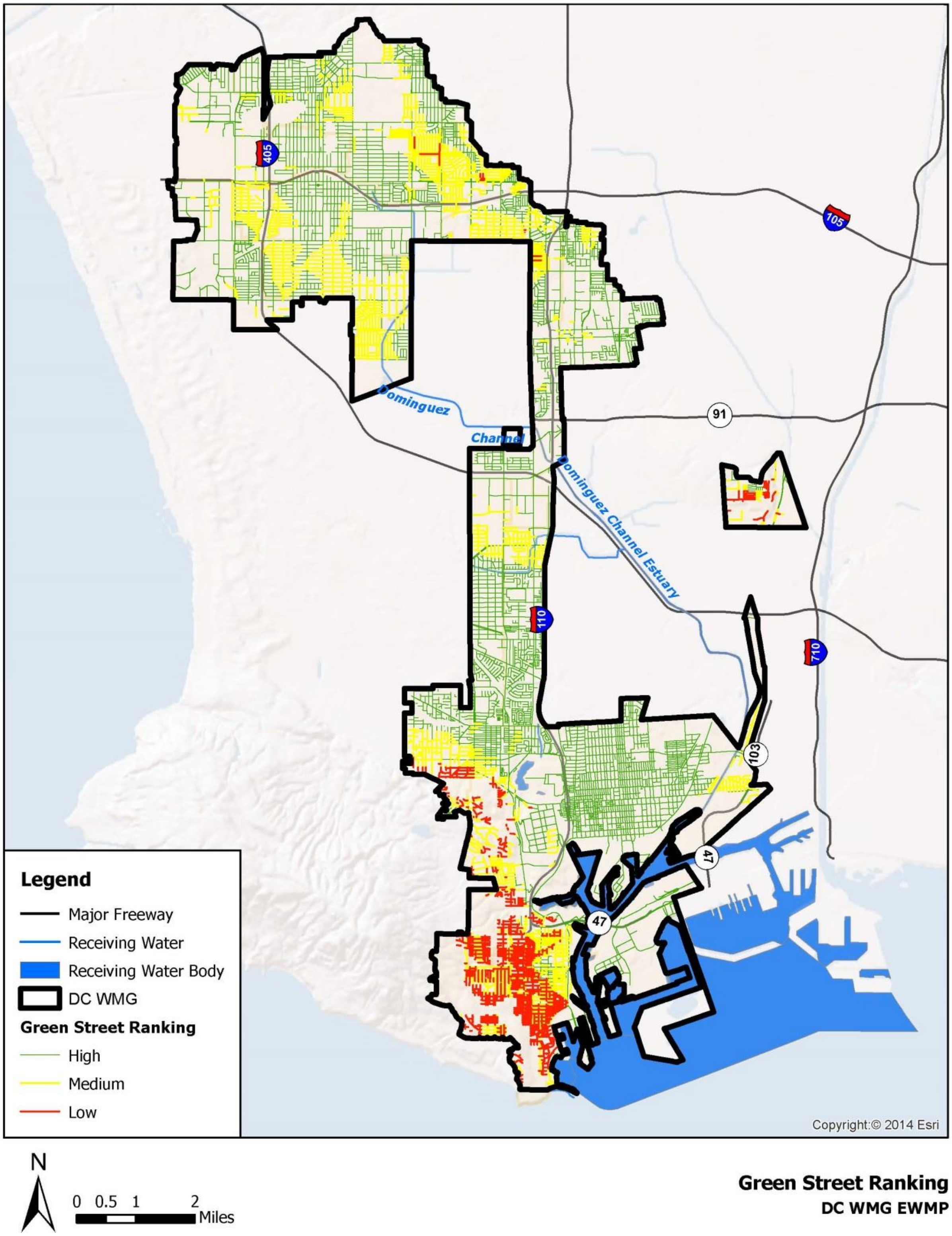


Figure 4-15: Green Street Opportunities within the DC WMG Area

4.2.6 Multi-Use Benefits from Injection Well Aquifer Recharge

There is a potential for utilizing the captured stormwater for municipal use within the watershed. One way of doing this is to directly irrigate with the captured stormwater. This can offset some potable water uses. However, the irrigation demands tend to be very low shortly after rain occurs and, therefore, it would be necessary to store the water until irrigation demands increase, which does not replenish the storage volume for capturing a subsequent storm. Another option for utilizing the water for municipal use would be to move it to a drinking water aquifer.

In the DC WMG area, the upper drinking water aquifer (Lynwood aquifers) ranges from 200 to 400 feet below ground surface. The shallow unconfined aquifers are not used for municipal supply due to low yields and uncertain water quality. In order to move captured stormwater to the deeper drinking water aquifers, it would be necessary to inject that water via injection wells. This would require approval from the Regional Water Quality Control Board. Once the water is placed in the drinking water aquifers, then the DC WMG agencies would need to obtain the rights to pump that new water from the drinking water aquifers.

The DC WMG is underlain primarily by the West Coast Groundwater Basin. A small portion of the eastern section of the DC WMG is underlain by the Central Basin Groundwater Basin. Both of these basins are adjudicated. Most water captured by projects in the DC WMG is likely to be injected, if feasible and practicable, into the West Coast Groundwater basin.

Adjudicated Rights in the West Coast Groundwater Basin, as of June 2014, for the cities in the DC WMG are shown Table 4.10.

Table 4.10: West Basin Allowable Pumping Allocation (APA)

Agency	AFY
Carson	0
City of Los Angeles	1,503
County of Los Angeles	466
El Segundo	953
Hawthorne	1,882
Inglewood	4,450
Lawndale	0
Lomita	1,352
Total	10,140

The requirements for obtaining increases in Allowable Pumping Allocations (APAs) and requirements for obtaining approval from the Regional Water Quality Control Board to inject captured storm water are presented in Attachment S and the following was found:

> "… injection of captured stormwater is potentially a viable means of achieving additional water rights within the Dominguez Channel Watershed. Both the Central and West Coast Basin Judgments provide specifically for approval of enhanced water rights as a result of augmentation projects developed by parties to one or both judgments. Whether injection projects developed through EWMP implementation are cost effective and viable will depend greatly on the quality of the stormwater captured, the parties participating and their respective resources, and the volume of water proposed for development. On balance, projects that are solely in the West Coast Basin are likely to be easier to permit from a water rights perspective given the somewhat more permissive nature of the West Coast Basin Judgment, as well as the fact that eight of the nine

> project sites overlie the West Coast Basin. Regulatory approvals from the LA Regional Water Quality Control Board are obtainable, and indeed likely to be supported by Regional Board staff (because of the water supply benefit), if the quality of water to be injected meets or exceeds all water quality objectives in the groundwater basin it overlies."

The key constraint to injection of the water into the potable drinking water aquifers is based on the water quality, rather than adjudicated water rights. The report indicated that to the extent that injected water exceeds receiving water limitations, permitting would require demonstration of no impairment of the municipal beneficial use designation from the Basin Plan, or the implementation of treatment that would eliminate such impairment prior to injection.

Due to the water quality of stormwater, it is expected that pre-treatment would be necessary. The costs of pre-treatment are related to acquiring storage area and the cost of the treatment system. The storage required for the injection wells would be for storing and pumping located at regional and distributed facilities. These costs have not been developed for this study. However, a small section discussing the expected capital construction costs and O&M costs for wells to inject the water captured by regional projects and green streets is provided in Section 7 for potential future discussion purposes.

An option being explored by the Water Replenishment District of Southern California (WRD) for replenishing the drinking water aquifers with captured surface water is called an Aquifer Recharge and Recovery Facility (ARRF). This is a system where captured surface water is allowed to infiltrate to the shallow groundwater aquifer, then this shallow groundwater is pumped and then injected into the deeper drinking water aquifer. The infiltration process acts as a natural filter for surface water pollutants, thus potentially preventing the need for additional pre-treatment (other than removing trash and sediment to prevent clogging of the infiltration system). WRD has not completed the approval process for ARRF yet, but it may be a promising method for treating captured surface water prior to injecting it. Additionally, this ARRF allows for one to extract the shallow groundwater and inject it months after the rain occurs, when the deeper aquifers have greater storage capacity due to pumping that occurs in the dryer months.

4.2.7 Approach to Identifying Additional BMPs

In some cases, the required pollutant reductions to achieve RWLs and WQBELs may be greater than can be achieved with identified opportunities for MCMs, LID, green streets, and regional projects. As such, to provide reasonable assurance, another category of regional BMP – Additional BMPs – is included in the RAA and EWMP Implementation Plan. Because specific opportunities for land acquisition and/or public-private partnerships cannot be confirmed during the timeframe of the EWMP development, the EWMP Implementation Plan described in Section 5 reports a conceptual volume of structural BMPs required in each subwatershed to achieve the required pollutant reductions. The Additional BMPs may or may not require land acquisition, depending on the types of public-public and public-private partnerships identified by the DC WMG. For example, coordination with schools will be a key factor for avoiding land acquisition, as a substantial portion of public acreage in the EWMP area is school property. These Additional BMPs may include a combination of additional regional projects, distributed BMPs, or other onsite management opportunities described below. Some coordination with schools has already begun, and the EWMP Group looks forward to discussing with the Regional Board potential approaches and incentives to encourage school participation

4.2.7.1. Additional Regional BMPs

Tables in Attachment O show parcels for each agency in the WMG that had relatively high scores, had potentially useable features, and were evaluated for the potential to accommodate a regional project. Generally these parcels drained significantly smaller catchments and the cost-effectiveness of using them for stormwater capture would be expected to be comparable to green streets. During future implementation, these and other opportunities will be further evaluated for potential implementation of regional projects or other distributed BMP opportunities.

4.2.7.2. Additional Distributed BMPs

Opportunities for additional distributed BMPs may exist at sites that do not fall under SUSMP, LID, or green streets policies. These sites will be further evaluated in order to evaluate if water quality improvements could be incorporated at a relatively low cost. Distributed BMPs also may be incorporated through future stakeholder processes, allowing the stakeholders to provide input on additional distributed BMP locations and types and help to stimulate volunteerism amongst private property owners to implement BMPs on their properties that may achieve a pollutant load reduction benefit. The adaptive management process will be used to evaluate how effective such distributed BMPs are and evaluate if modifications to planned regional or green streets projects are necessary.

4.3 Non-Storm Water Discharge Control Measures

The following section discusses the approach to non-storm water discharge control measures and the non-storm water outfall program.

4.3.1 Potential Approaches to Additional Non-Stormwater Discharge Control Measures

Non-stormwater discharge is from an activity that generally consists of washing down something, over irrigating, or an illicit/illegal connection or discharge. MCMs and other institutional BMPs are in place in an attempt to reduce non-stormwater discharges. One source of non-stormwater discharge that is not addressed through the MCMs and other institutional BMPs are exempt non-stormwater discharges as specified in Part III of the MS4 Permit.

In order to evaluate effective non-stormwater discharge control measures, in addition to those already required, the dry weather discharge monitoring element of the CIMP will be used as an evaluation tool. As specified in the CIMP, the DC WMG will report non-stormwater discharges that occur in their jurisdiction and actions taken to evaluate if they are persistent, exempt and, if non-exempt, actions taken and/or BMPs implemented to eliminate them. Exempt non-stormwater discharges often include non-emergency firefighting activities, discharges from drinking water supplies, dewatering of lakes, landscape irrigation, swimming-pool discharges, decorative fountain dewatering, car washes, and street/sidewalk washing per Part III.2 of the MS4 Permit.

Non-Storm Water Outfall Program

This section presents the method for the NSW outfall program component as prepared in the CIMP for the DC WMA Group. The NSW Outfall Monitoring Program is a major component of the monitoring and reporting program (MRP) and is intended to be a collaborative effort between all of the agencies in the DC WMA Group. The NSW outfall monitoring program component is intended to enhance the existing permit required programs that include LACFCD's efforts under the IC/ID Program to detect, investigate, and eliminate the IC/IDs to the MS4, pursuant to Part VI.D.4.d and the responsibilities of the County of Los Angeles and the Cities of Carson, El Segundo, Hawthorne, Inglewood, Lawndale, Lomita, and Los Angeles under Part VI.D.10 of the Permit.

The NSW Monitoring Program is comprised of the following elements.

1. Identification of Outfalls with Significant NSW Discharge
2. Inventory of MS4 Outfalls with NSW Discharge
3. Prioritized Source Identification
4. Identification of Sources of Significant NSW Discharge
5. Monitoring of Significant NSW Discharges Exceeding Criteria

Objectives of the NSW Program

The intent of the NSW Program is to meet the requirements of the NSW Outfall Program (Section II.E.3, Page E-4) outlined in the MRP of the Permit by achieving the following objectives:

a. Evaluate whether a Permittee's discharge is in compliance with applicable non-storm water TMDL WLAs.
b. Evaluate whether a Permittee's discharge exceeds non-storm water action levels, as described in Attachment G of the Permit.
c. Assist the Permittee in identifying illicit discharges as described in Sections VI.D.4.d and VI.D.10 of the Permit.

Approach Overview

The approach to addressing NSW discharges is to implement a programmatic approach to identifying non-storm water discharges and estimating if the discharge is a persistent and significant non-permitted discharge that affects the quality of the downstream receiving water and as such, is a significant NSW discharge. Figure 4-16 illustrates the process by which these discharges are evaluated and incorporated into the NSW Program. Table 4.11 provides the required program components of the NSW Program and the relative timing required.

In order to address significant NSW discharges in the watershed, a progressive approach consisting of visual inspections, investigations, and evaluations combined with the existing IC/ID enforcement framework that exists for industrial waste dischargers will be used. This process will be a multi-step procedure to categorize outfall sites for their potential for persistent and significant discharge that may affect the water quality of the downstream receiving water body during dry weather. The initial identification of outfalls with significant non-storm water discharges will utilize screening based on visual observations (at least three visual surveys) and recorded observational data. The location of these outfalls will be compared against the known permitted discharges in order to eliminate those outfalls from further screening. If necessary, the DCWMA Group may follow up with the permitted dischargers through the existing Industrial Waste permit framework to confirm that the discharge is meeting permit requirements. For other discharges, the agencies would utilize the existing IC/ID investigation framework to track down the source of the non-permitted discharge. The information from the investigation would be used to address illicit discharges. Once the source is determined, or determined to be unknown, and cannot be eliminated, the next step will consist of monitoring, and an assessment of impacts to downstream receiving waters based on the monitoring results. This stage would use a combination of flow monitoring and analytical chemistry to assess the pollutant loading contributed by the site. If the site is found to be contributing to an exceedance, the DC WMA Group or the jurisdiction will address the non-storm water discharge through the EWMP.

Table 4.11: NSW Outfall Program Summary Table

NSW Program Component	Description	Timing of Completion
1. Outfall Screening	In order to implement the NSW Outfall Program, the DCWMA Group will implement a screening process to identify outfalls that exhibit significant NSW discharges and those that do not.	Prior to initiating source investigations
2. Develop Inventory of NSW Outfalls with discharge	An inventory will be developed of major MS4 outfalls with known significant NSW discharges and those requiring no further assessment.	
3. Develop Prioritization Criteria	Based on data collected during the Outfall Screening process, the DCWMA Group will identify MS4 outfalls with significant NSW discharges and those requiring no further action.	
4. Prioritized source investigation	The data collected as part of the Outfall Screening process will be used to prioritize outfalls for source investigations.	
5. Identify sources of significant NSW discharges	For outfalls exhibiting significant NSW discharges, source investigations per the established prioritization.	Source investigations will be conducted for 25% of the outfalls with significant NSW discharges by December 28, 2015 and 100% by December 28, 2017.
6. Monitor NSW discharges exceeding criteria	The DCWMA Group will monitor outfalls that have been determined to convey significant NSW discharges comprised of either unknown or non-essential conditionally exempt NSW discharges, or continuing discharges attributed to illicit discharges.	Monitoring will commence after completion of source investigations.

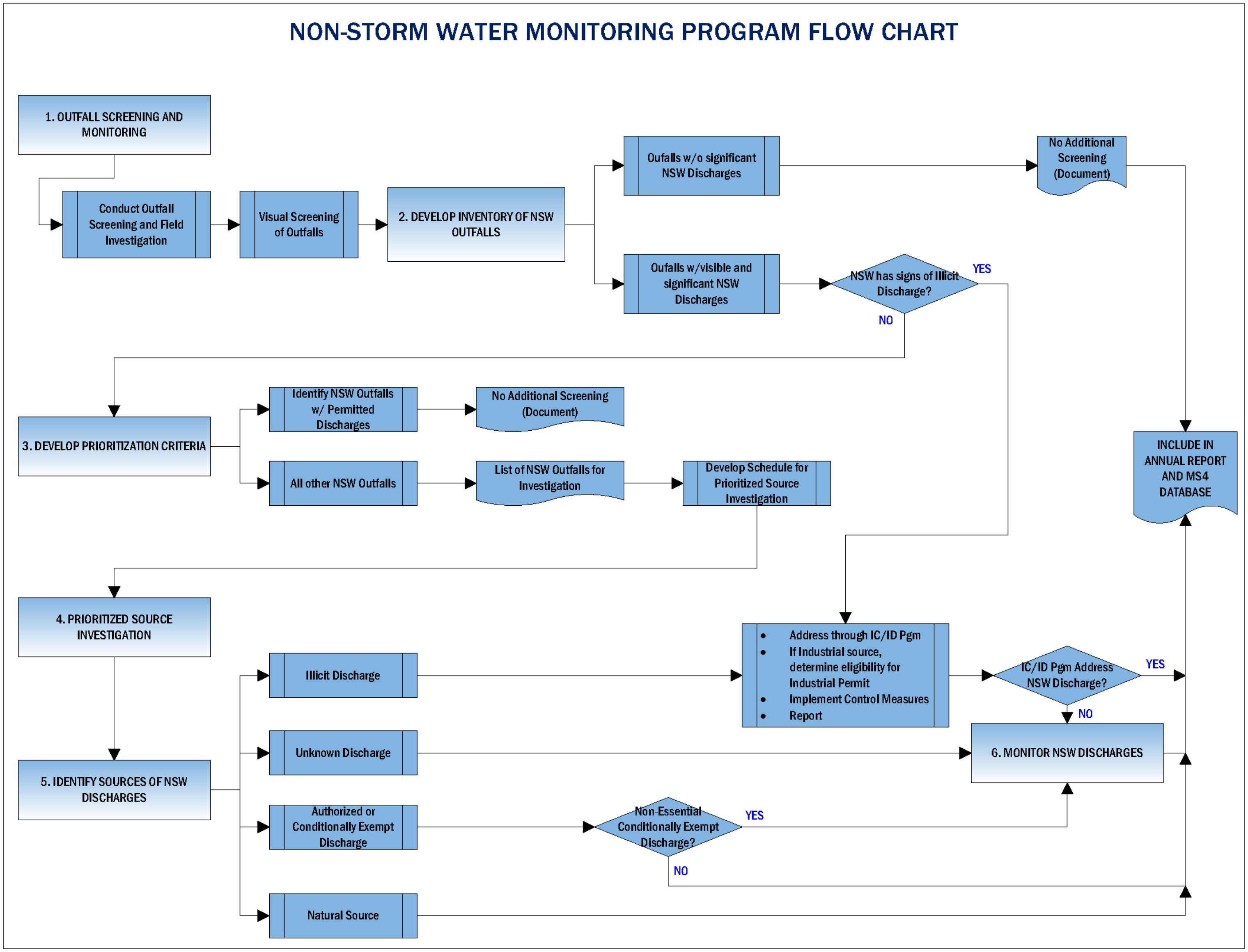


Figure 4-16: NSW Monitoring Program Process Chart

The LID ordinances, regional projects, and green streets projects, due to their water capture and infiltration capacities will also capture and infiltrate dry weather incidental (non-stormwater) discharges in addition to the wet weather discharges for which they are sized and configured. Analysis suggests that these projects will reduce non-stormwater discharges to meet the water quality planning objectives as they are implemented. The implementation schedules for the projects (Section 5) suggest that the milestones for reducing non-stormwater discharges will also be met.

4.4 Summary of BMP Performance Data

To summarize performance data of structural (regional and distributed), and institutional (non-structural) control measures for reducing stormwater and non-stormwater flows and priority pollutants, the following sources were reviewed and performance data was compiled:

- CASQA Development and Municipal BMP Handbooks
- California Department of Transportation (Caltrans) BMP Retrofit Pilot Program Report
- Center for Watershed Protection's National Pollutant Removal Performance Database Vers. 3
- Priority A and B Catch Basin Cleanout Data

Tables summarizing the BMP performance data can be found in Attachment T. The table associated with the CASQA Development and Municipal BMPs handbook provides a general summary of BMP performance within Southern California, while the tables associated with the other sources provides site specific performance data based on site specific testing.

5. EWMP Implementation Plan

The EWMP Implementation Plan is the "recipe for compliance" for the WMG to address Water Quality Priorities and comply with the provisions of the MS4 Permit. Through the RAA, a series of quantitative analyses were used to identify the capacities of LID, green streets, and regional BMPs that comprise the EWMP Implementation Plan. The RAA also assures those control measures will address the Water Quality Priorities within the specified compliance schedules. The EWMP Implementation Plan includes a recipe for of the WMG's assessment areas (see Figure 3-1 for a map of these assessment areas). Implementation of the EWMP Implementation Plan will provide a BMP-based compliance pathway for the WMG to achieve the MS4 Permit. This section describes the EWMP Implementation Plan for the WMG and the pace of its implementation to achieve applicable milestones, through the following subsections:

- Elements of the EWMP Implementation Plan (5.1)
- Milestones for Regional Projects and Additional Institutional BMPs (5.2)
- Stormwater control measures to be implemented by 2040 for final compliance (5.3)

5.1 Elements of the EWMP Implementation Plan

The EWMP Implementation Plan for the WMG is expressed in terms of [1] the volumes[11] of stormwater and non-stormwater to be managed by the WMG to address Water Quality Priorities and [2] the control measures that will be implemented to achieve those volume reductions. The two primary elements of the EWMP Implementation Plan are as follows:

- **Compliance Targets:** for MS4 compliance determination purposes, the ultimate metric for EWMP implementation is the volume of stormwater managed by implemented control measures. The stormwater volume to be managed[12] by the WMG is considered a measurable goal that will be used to assess BMP-based compliance. To support future compliance determination and adaptive management, the volume of stormwater is reported along with the capacities of control measures to be implemented by the WMG in the EWMP Implementation Plan.

- **EWMP Implementation Plan:** the network of control measures that has reasonable assurance of achieving the Compliance Targets is referred to as the EWMP Implementation Plan. The identified BMPs (and BMP preferences) will likely evolve over the course of adaptive management in response to "lessons learned." As such, it is anticipated the BMP capacities[13] within the various subcategories will be reported to the Regional Board but not tracked explicitly by the Regional Board for compliance determination. As BMPs are substituted over the course of EWMP implementation (e.g., replace green street capacity in a subwatershed with additional regional BMP capacity), the Group will show equivalency for achieving the corresponding Compliance Target.

[11] Volume is used rather than pollutant loading because volume reduction is more readily tracked and reported by MS4 agencies. The volume reductions are actually a *water quality* improvement metric based on required pollutant reductions.
[12] The volume is determined by reporting the amount of water that would be retained (infiltrated) by BMPs over the course of a 24-hour period under the critical 90th percentile storm condition. Additional volume would be *treated* by these BMPs, but that additional treatment is *implicit* to the reported Compliance Targets.
[13] While the EWMP Implementation Plan reports the *total* BMP capacity to be implemented, that capacity is not a compliance target because some BMP capacities are sized to reflect a BMP program rather than sized to achieve the required reduction. For example, the BMPs implemented by the LID ordinance and the residential LID program were sized to retain the 85th percentile, 24-hour storm but that volume may be larger than is needed to achieve zinc RWLs. If those BMPs were replaced by a different type of BMP (e.g., regional BMP), the total BMP capacity may be smaller but just as effective.

5.2 Milestones for Regional Projects and Additional Institutional BMPs

In addition to the scheduled stormwater capture milestones detailed in the next subsection (5.3), planning milestones are incorporated into the EWMP Implementation Plan. This section describes the milestones for additional institutional BMPs and planning milestones for regional BMPs.

5.2.1 MCMs and Institutional BMPs

As discussed in Section 4.1, all of the WMG agencies will implement the MCMs prescribed in the 2012 MS4 Permit by 2017, and specific additional institutional BMPs (enhanced sweeping or trash capture devices) will be implemented by 2017 by all agencies except City of Los Angeles. Table 4.3 and Table 4.4 detail these implementation milestones by jurisdiction and BMP type.

5.2.2 Regional Projects

As part of EWMP development, the WMG conducted an extensive process that resulted in identification of multiple regional projects (Section 4.2.4). The EWMP Implementation Plan includes completion of these projects prior to 2026 milestone. Table 5.1 summarizes the anticipated project timeline including the design, bid, and construction phases. Operation and maintenance (O&M) of each of the projects will begin following construction. The contributing jurisdiction for each regional BMP are also identified in Table 5.1.

In addition, the EWMP Implementation Plan includes planning milestones for identified potential regional projects. Specifically, for each regional project in Table 5-1, the contributing WMG members will achieve the following by December 2017:

- Evaluate whether the project is desirable and will be further pursued;
- Evaluate mechanisms for jurisdictional cost sharing for multi-jurisdictional projects (if applicable); and
- Evaluate options for funding to construct the facility, either through grants, loans or stormwater fees.

If, over the course of further planning for the signature regional projects, it is determined the projects are not feasible or desirable, then equivalent projects will be identified in terms of stormwater managed.

Table 5.1: Regional Project Timeline

Regional Project	Design[1] (yrs)	Bid (yrs)	Construction (yrs)	Total Time (years)	Completion Year	Jurisdictions Involved							
						City of Carson	City of El Segundo	City of Hawthorne	City of Inglewood	City of Lawndale	City of Lomita	City of Los Angeles	Los Angeles County
Darby Park	1	0.5	2	3.5	2026				•				
El Segundo Pump Station	1	0.5	2	3.5	2026		•						
Ramona Park	1	0.5	4	5.5	2026			•					•
Jim Thorpe Park	1	0.5	3	4.5	2026			•					
Hawthorne Memorial Park	1	0.5	3	4.5	2026			•					
Chester Washington Golf Course	2	0.5	5	7.5	2026							•	•
Harbor City Park	1	0.5	6	7.5	2034						•	•	•
Wilmington Recreation Center	1	0.5	3	4.5	2026							•	
Averill Park	2	0.5	3	5.5	2026							•	
Alondra Park	2	0.5	4	6.5	2026		•	•		•			•
Carriage Crest Park	1	0.5	3	4.5	2040	•							
City Hall/Civic Center	1	0.5	3	4.5	2026	•							

[1] For the five sites with field investigations performed during development of the EWMP, additional field investigations may be performed to during the design phase. For the remaining seven sites where field investigations were not performed during development of the EWMP, these investigations will be performed during the design phase to support project designs.

5.3 Control Measures to be Implemented by 2040

The EWMP will guide stormwater management by the WMG for the coming decades, and the control measures to be implemented have the potential to transform communities including widespread incorporation of green infrastructure. The EWMP Implementation Plan identifies the location and type of control measures to be implemented by the WMG for final compliance by 2040, which includes addressing all Water Quality Priorities including the limiting pollutants total zinc and *E. coli*. The control measures will be implemented over time to achieve a 50% milestone in 2026 established by the EWMP for the Harbor Toxics TMDL, a final compliance milestone to achieve the Harbor Toxics TMDL by 2032, and a final bacteria milestone by 2040[14].

The EWMP Implementation Plan is presented as the following components:

- **Summary of total capacity of control measures to be implemented and stormwater volumes to be managed by the WMG across the entire EWMP area by 2040:** shown in Figure 5-1 is a bar graph that details the various sub-categories of control measures to be implemented by each jurisdiction across all of its receiving waters, compared to other jurisdictions in the DC WMG. These control measures are also detailed in Table 5.2, along with the corresponding Compliance Targets (24-hour volumes to be managed) by each jurisdiction by 2040. Shown in Figure 5-2 is a map of the "density" of control measure capacities to be implemented across the watershed by 2040.
- **Scheduling of control measures to achieve milestones:** the schedule of control measures over time is represented in Figure 5-5 through Figure 5-10. For each jurisdiction, the figures show bar charts that represent the control measure capacities to be implemented over time, by receiving water. Presented in Attachment AB are tables that detail these control measure capacities, along with the corresponding Compliance Targets (24-hour volumes to be managed) by each jurisdiction at each milestone up to 2040.

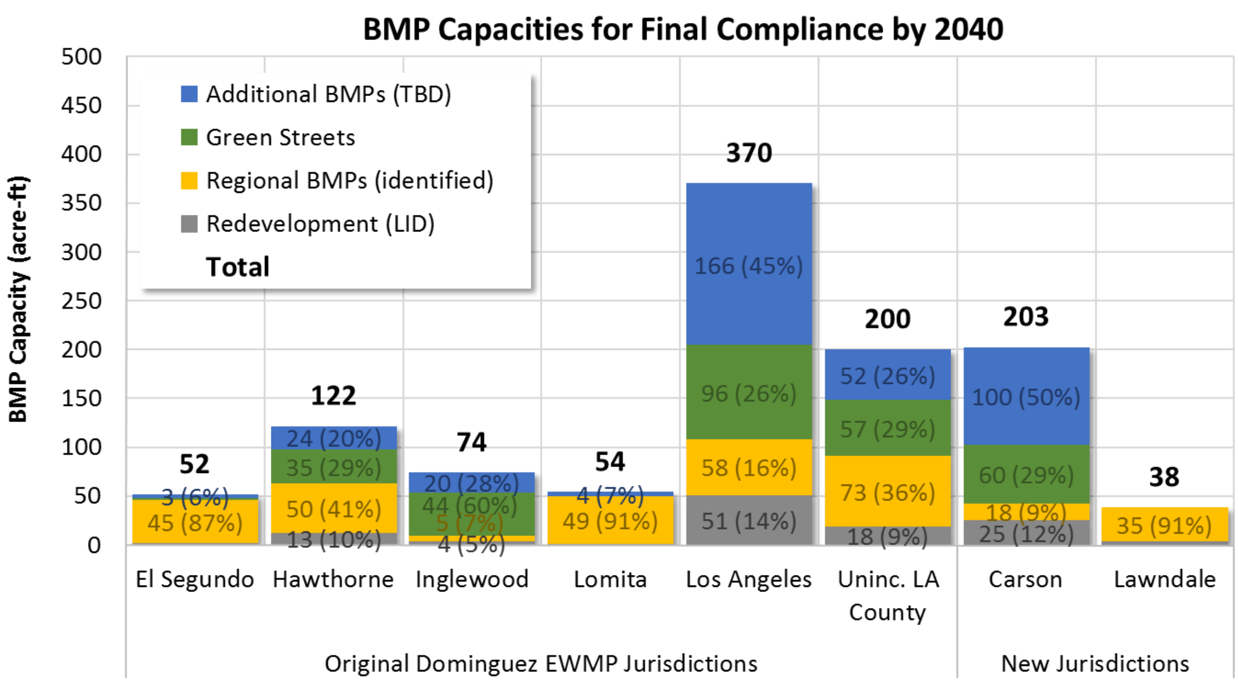


Figure 5-1. Control Measure Capacities to be Implemented by the DC WMG by 2040

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[14] For the small area that drains to the LA River/Compton Creek, the final compliance date is 2037.

Table 5.2: Dominguez Channel Watershed – Summary of volume managed and BMP capacity by jurisdiction for final compliance

COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		**EWMP IMPLEMENTATION PLAN:** APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
Jurisdiction	**24-hour Volume Managed (acre-ft)**	**LID/Redevelopment**	**Green Streets**	**Regional BMPs (identified)**	**Additional BMPs (TBD)**	**Total BMP Capacity (acre-ft)**
Carson	231.7	24.9	59.5	17.7	100.3	**202.6**
El Segundo	63.6	1.4	2.0	44.9	3.3	**51.5**
Hawthorne	151.6	12.5	35.3	50.1	23.7	**121.6**
Inglewood	96.5	4.1	44.1	5.2	20.4	**73.8**
Lawndale	42.2	3.5	0.0	34.8	0.0	**38.3**
Lomita	38.2	1.3	0.0	49.0	3.8	**54.1**
Los Angeles	433.1	50.7	96.0	57.8	165.6	**370.2**
Uninc. LA County	212.4	18.4	57.2	72.9	51.6	**200.1**
Total	**1,284.30**	**116.8**	**294.2**	**332.4**	**368.9**	**1,112.3**

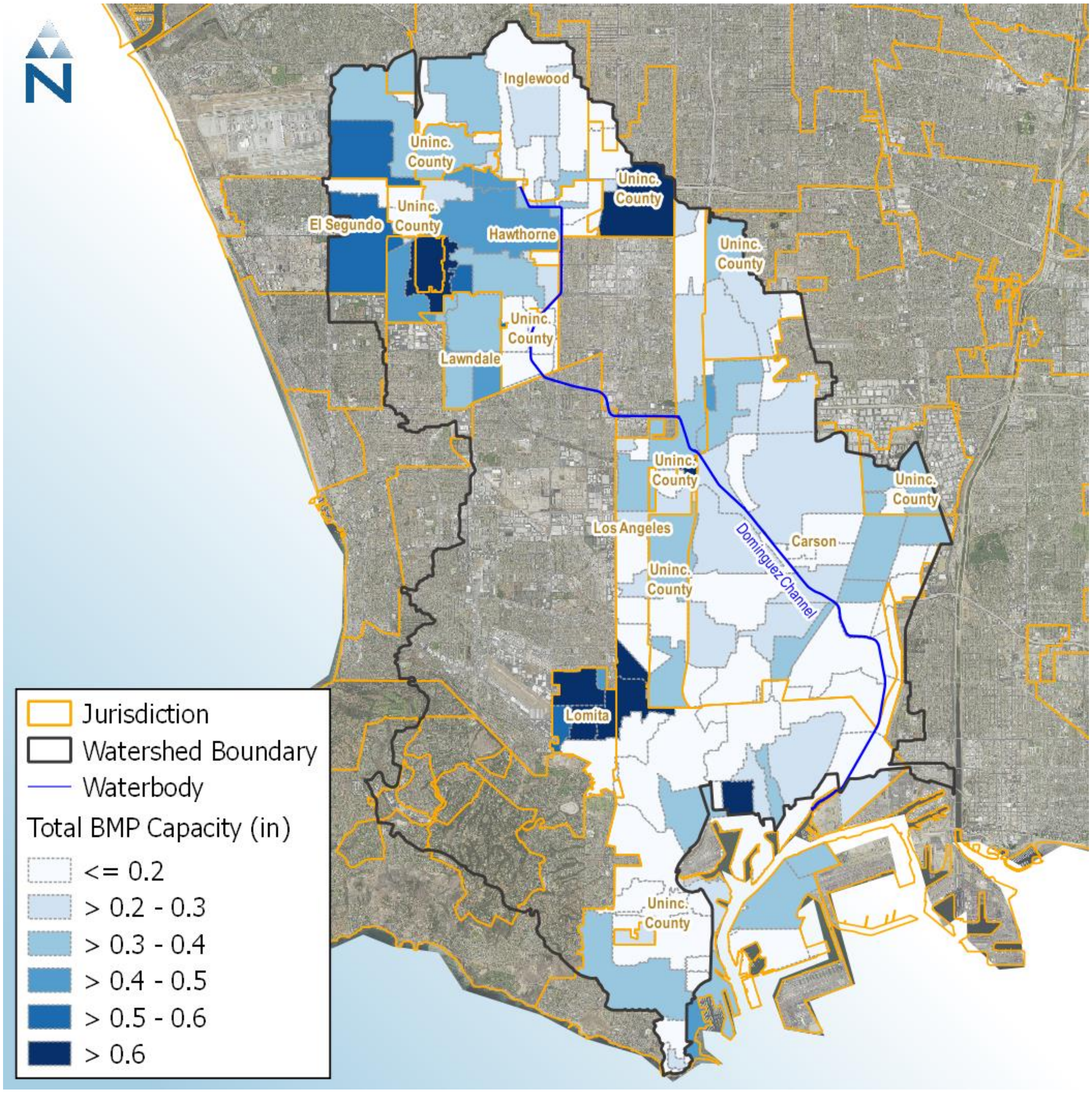

Figure 5-2. Control Measure Capacities to be Implemented by 2040 across the DC EWMP Area

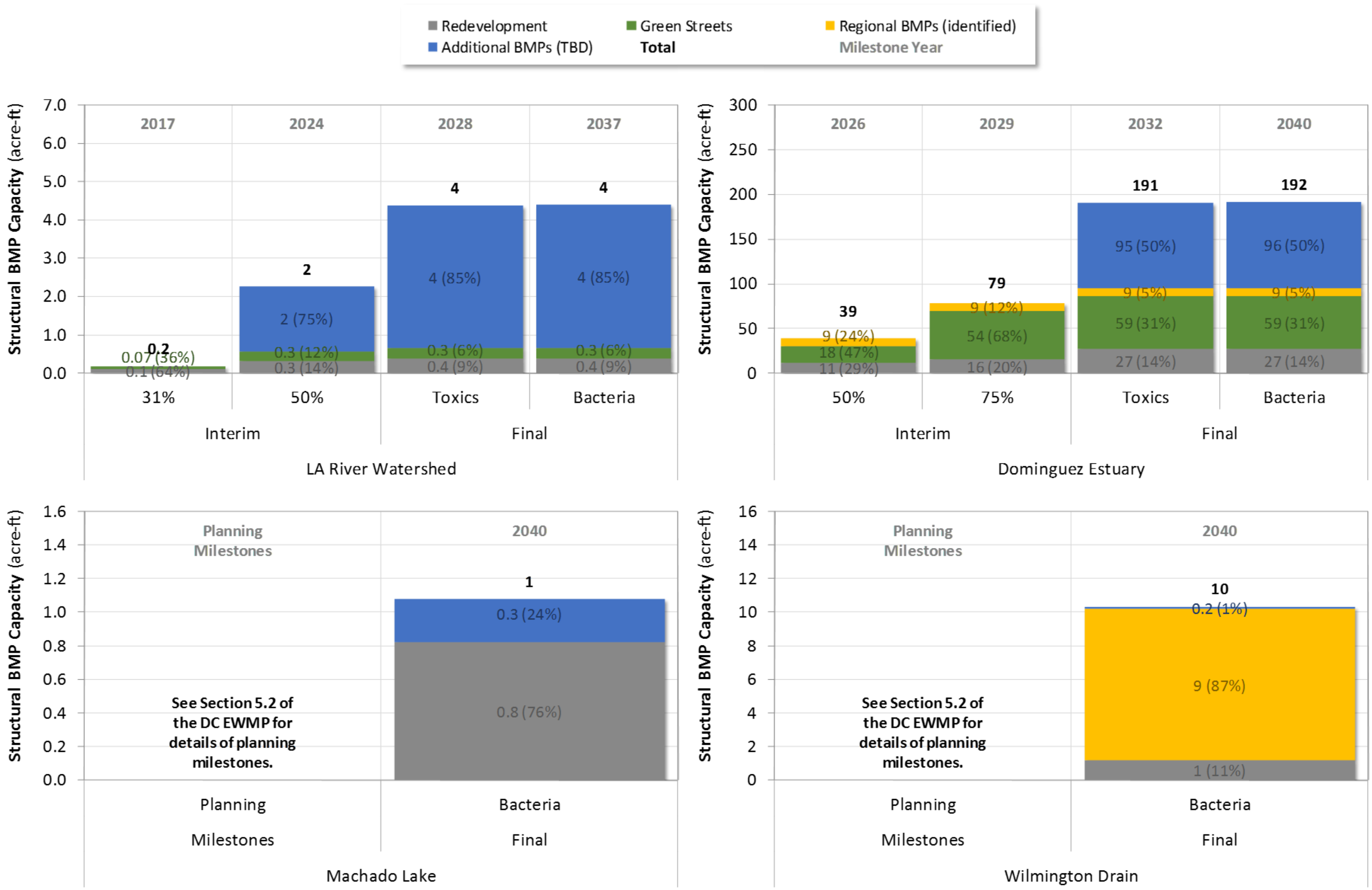

Figure 5-3. Carson: Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

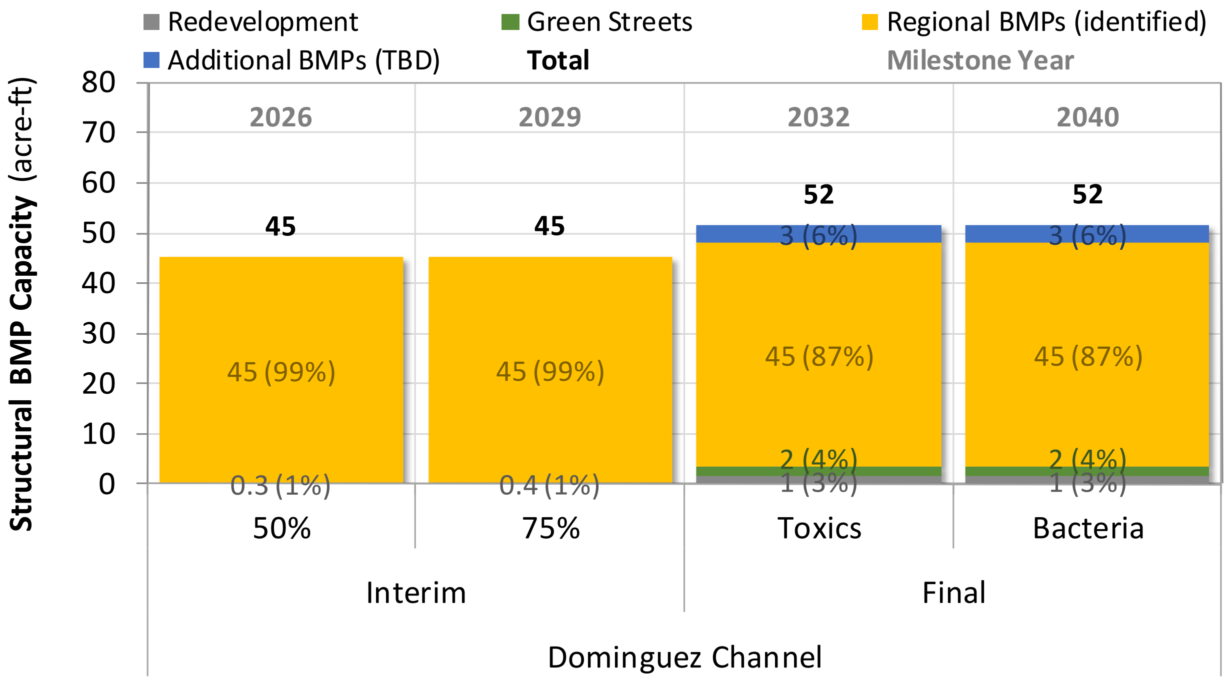

Figure 5-4. El Segundo (Dominguez Channel): Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

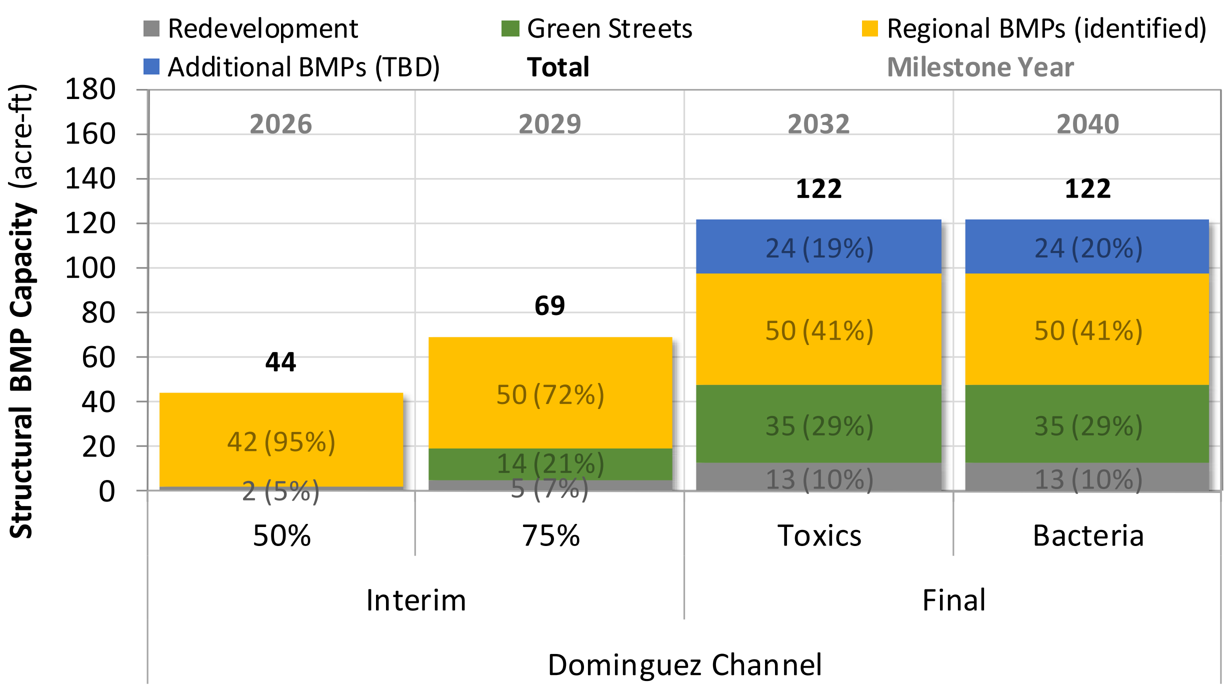

Figure 5-5. Hawthorne (Dominguez Channel): Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

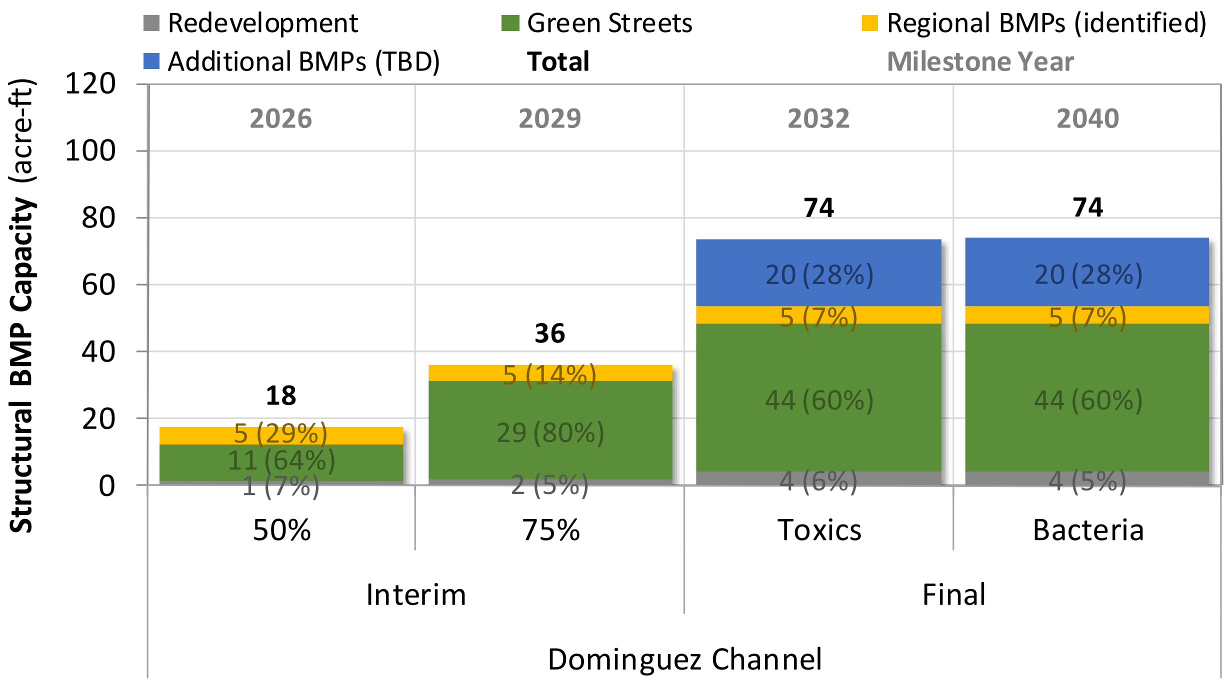

Figure 5-6. Inglewood (Dominguez Channel): Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

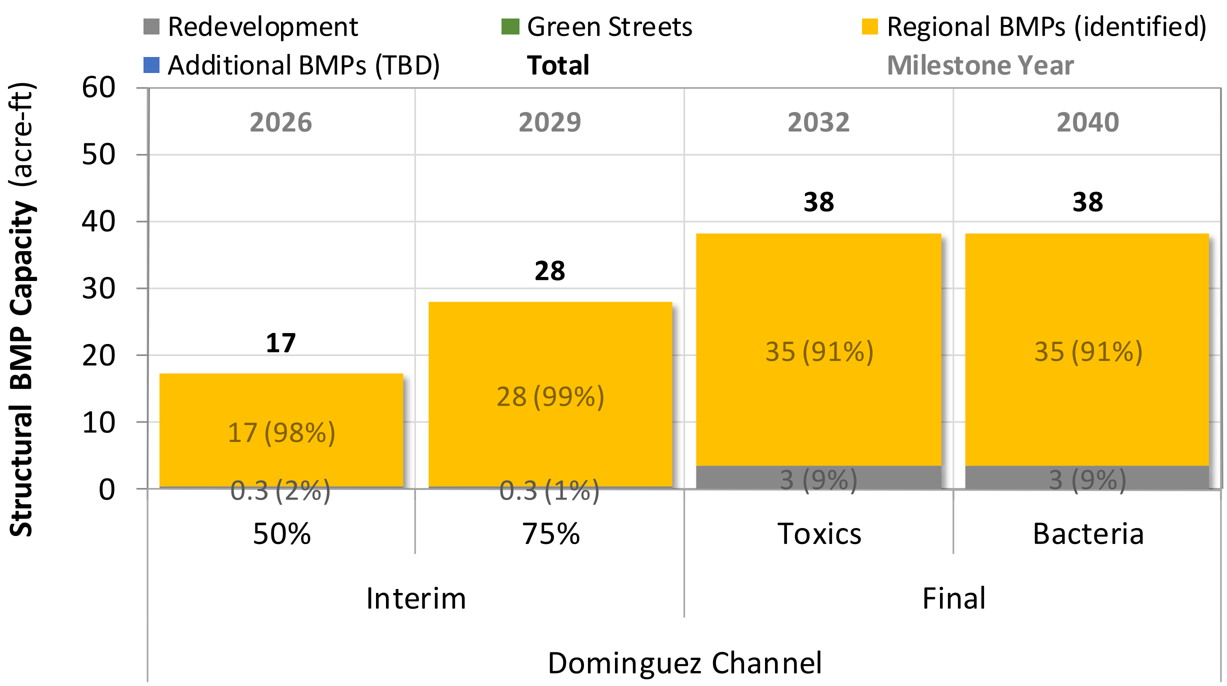

Figure 5-7. Lawndale (Dominguez Channel): Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

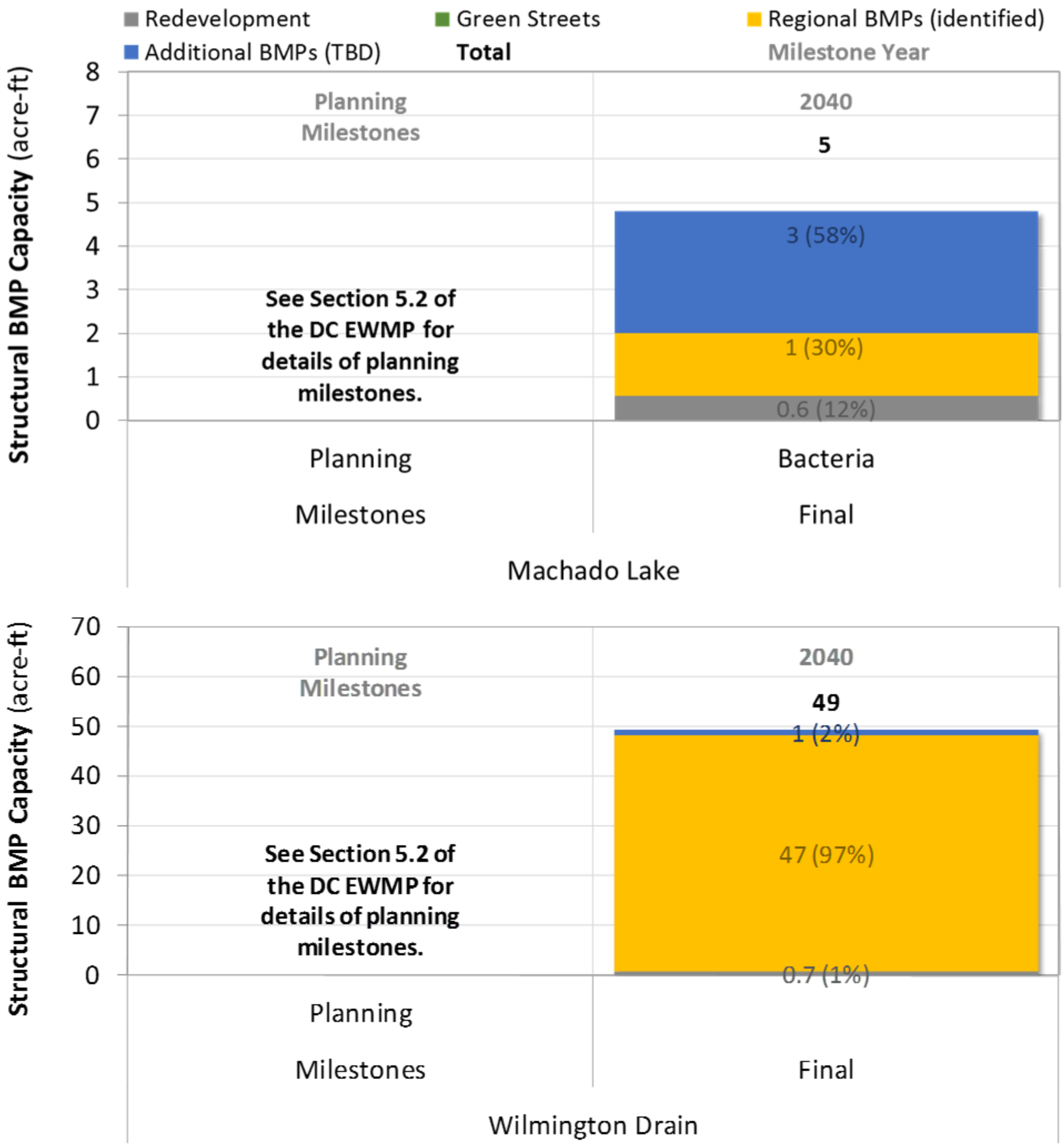

Figure 5-8. Lomita: Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

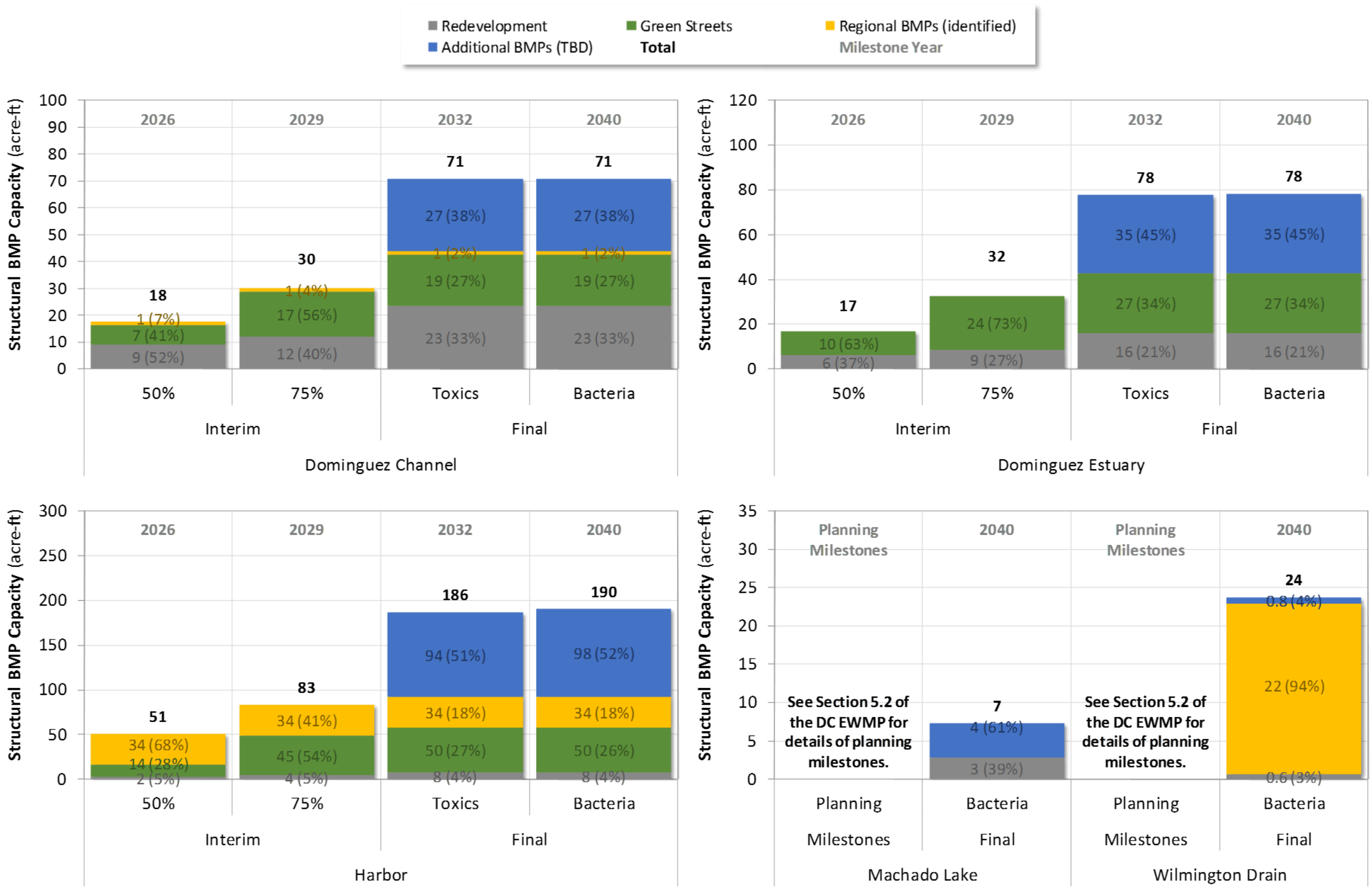

Figure 5-9. Los Angeles: Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

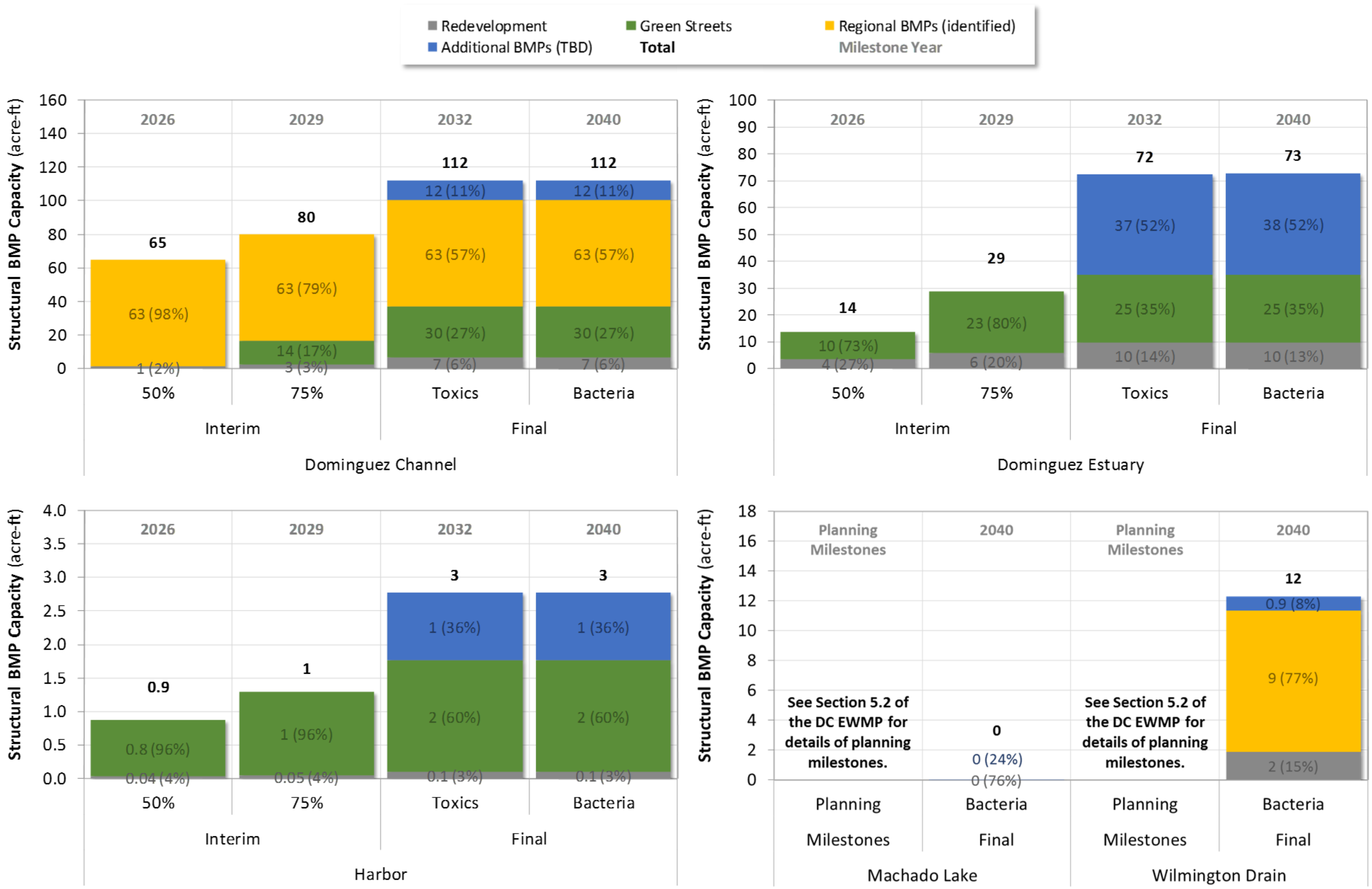

Figure 5-10. Uninc. LA County: Scheduling of EWMP Implementation Strategy to Achieve EWMP / TMDL Milestones.

6. Assessment and Adaptive Management Framework

The EWMP is part of an adaptive management process as described in Part VI.C.8 (pages 66-67) of the MS4 Permit. Part VI.C.8 (page 66-67) states that every two years the EWMP will adapt to become more effective, based on, but not limited to, the following:

- Progress towards achieving interim and/or final WQBELs/RWLs according to TMDL schedules;
- Progress towards achieving improved water quality in MS4 discharges and achieving receiving water limitations through implementation of watershed control measures based on an evaluation of outfall-based and receiving water monitoring data;
- Achievement of interim milestones;
- Re-evaluation of the water quality priorities identified for the DC WMG based on more recent water quality data for discharges from the MS4 and receiving waters(s) and a reassessment of sources of pollutants;
- Availability of new information and data from sources other than the Permittees monitoring programs within the DC WMG that informs the effectiveness of the actions implemented;
- Regional Board recommendations; and
- Recommendations for modifications to the EWMP through a public participation process.

The adaptive nature of the EWMP allows the process to be iterative, allowing the DC WMG and other groups to identify a plan that is successful in improving water quality in their region. Figure 6-1 displays a flow chart of how this framework may be used.

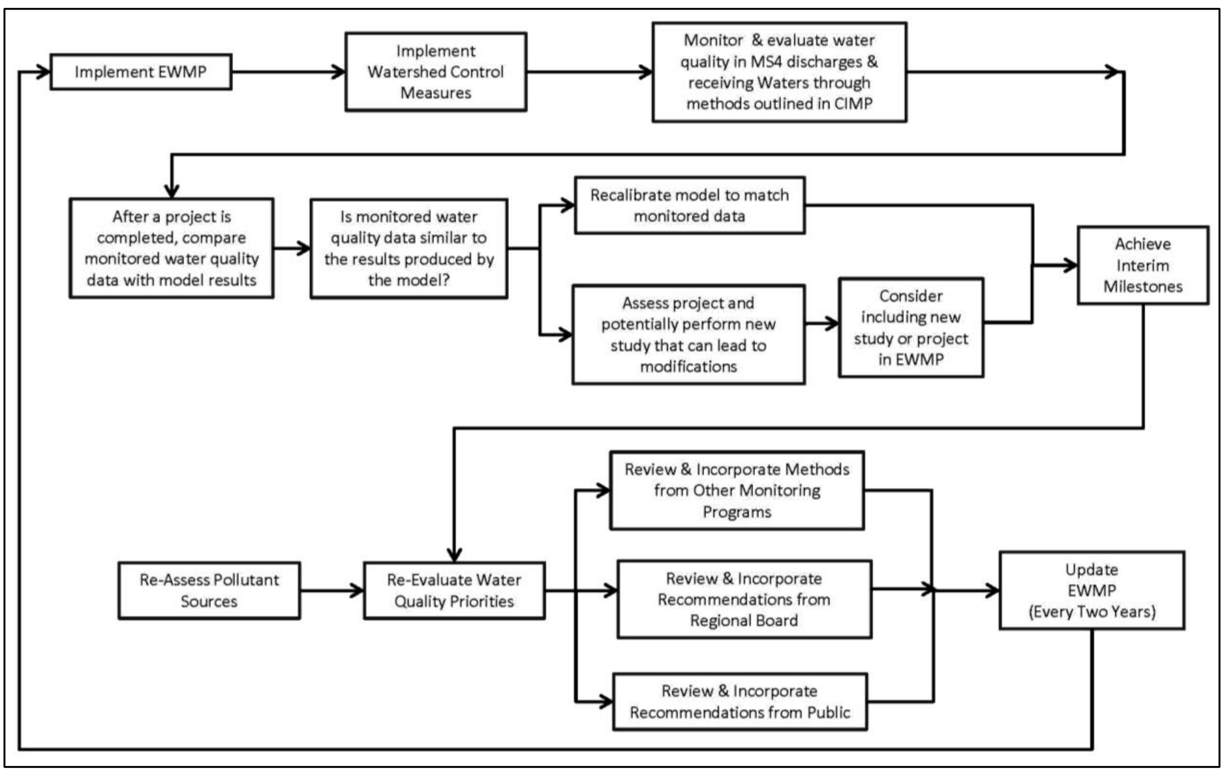

Figure 6-1: Assessment and Adaptive Management Flow Chart

As shown in this flow chart, a primary tool proposed for evaluating if implementing the EWMP is meeting the planning objectives is the model. Monitoring data will be used to check and, if necessary, adjust the model calibration, which will then be used to simulate the effects of existing and future projects on flows and concentrations. This will evaluate if the projects, as modeled, are meeting the planning objectives.

This calibration check will then be used to either 1) update the model calibration and run simulations to see if the EWMP projects need modifications, or 2) stay the course.

7. EWMP Implementation Costs and Financial Strategy

The purpose of this section is to present the financial strategy for addressing the additional costs of implementing the EWMP as described in the 2012 MS4 permit. The definition of a financial strategy varies across industries. In the context of the EWMP, the financial strategy is interpreted to represent the strategic options available to the Permittees to finance the program costs associated with implementing the EWMP and the appropriate application and prioritization of these options.

This section provides an overview of the following:

- Documentation of probable EWMP program costs;
- Assessment of impact of program costs on Permittees;
- Review of existing policies, revenues and costs affecting stormwater; and
- Identification of a prioritized financial strategy for financing program costs including identification of potential future steps to support the financial strategy.

7.1 Program Costs

7.1.1 Probable EWMP Program Costs

The purpose of this section is to present the probable order-of-magnitude cost opinions to implement the EWMP. The cost opinion for program costs were developed using feasibility study level engineering cost estimation procedures. The EWMP identified projects to be completed along a timeline. These projects are broken into four categories: (1) Minimum Control Measures (MCMs), excluding implementation of LID ordinances for new and re-development, (2) LID ordinance implementation for new and re-development, (3) regional projects, and (4) distributed projects, which are primarily green streets.

Non-Structural BMPs

As discussed in Section 4, numerous non-structural BMPs will be implemented:

- MCMs as specified in the MS4 permit.
- Implementation of SB 346, which reduces sources of copper.
- Implementation of LID ordinances in the Permittees new and re-development programs.

For these non-structural BMPs, the incremental costs beyond those currently being spent by the Permittees are expected to be negligible. The enhanced MCMs have been implemented in the current budgets. Administration of the LID ordinances has been implemented in the current budgets. Implementation of SB 346 requires no costs on the part of the DC WMG agencies.

Regional Projects

Based on the concept drawings shown in Figure 4-5 through Figure 4-14 and estimated sizing requirements for the regional projects, preliminary probable capital and operations and maintenance cost opinions were developed for each of the regional projects. The probable cost opinions were developed using standard engineering cost estimation procedures, which rely on published unit costs for work and materials where available and the cost estimator’s best judgment based on prior experience with engineering and construction for relative costs (e.g. design = 10% of construction). Table 7-1 summarizes some of the typical line items included in the cost opinions and their associated assumptions. The items included are broken into three categories: engineering, construction support, and construction.

Table 7-1: Regional Project Probable Cost Opinion Assumptions	
Description	**Assumption(s)**
Engineering	
Design Plan and Specifications	10 percent of construction cost
Permits	Does not include CEQA
Environmental Assessment (CEQA)	Initial study/mitigated negative declaration equivalent to 25 percent of engineering design cost
Construction Support	
Construction Administration and Inspections	8 percent of construction cost
Construction	
Mobilization	10 percent of construction cost
Excavation	Extended arm not needed, bench available for equipment entry, shoring not needed, includes clearing, grubbing, and debris disposal
Fill	Fill from excavated material, no import necessary
Soil Export	30 mile or less haul route
Landscaping and Irrigation	Includes tree replacement
Diversion Pipe	Includes traffic control, road excavation, pipe installation, road restoration, and sidewalk restoration
Storage (Pipes or Concrete)	Includes pretreatment cost. Unit cost is based on past experience with similar sized projects and goals.

Table 7-2 summarizes the engineering, construction support, construction, and total costs associated with each of the regional projects included in the RAA. Attachment U includes a more detailed breakdown of associated costs.

Table 7-2: Regional Project Cost Summary				
Regional Project	**Engineering**	**Construction Support**	**Construction**	**Total**
Darby Park	$520,000	$396,000	$4,947,000	**$5,863,000**
El Segundo Pump Station	$162,000	$109,000	$1,086,000	**$1,357,000**
Ramona Park	$1,788,000	$1,410,000	$17,623,000	**$20,821,000**
Jim Thorpe Park	$1,559,000	$1,116,000	$15,337,000	**$18,012,000**
Hawthorne Memorial Park	$827,000	$583,000	$8,013,000	**$9,423,000**
Chester Washington Golf Course	$5,074,000	$4,039,000	$50,488,000	**$59,601,000**
Harbor City Park	$7,225,000	$5,760,000	$71,994,000	**$84,979,000**
Wilmington Recreation Center	$1,252,000	$892,000	$12,255,000	**$14,399,000**
Averill Park	$2,183,000	$1,726,000	$21,568,000	**$25,477,000**
Carriage Crest Park	$875,237	$700,190	$8,752,370	**$10,327,797**
Carson City Hall	$875,200	$700,160	$8,752,000	**$10,327,360**
Alondra Park	$6,734,000	$5,387,000	$67,340,280	**$79,461,000**
Total Cost:	**$29,074,000**	**$22,818,000**	**$288,155,650**	**$340,047,000**

The annual operations and maintenance costs were also estimated for the regional projects. Based on the California Stormwater Quality Association (CASQA) BMP Handbooks and experience, one to two percent of the construction cost is recommended as the annual maintenance cost. An annual maintenance cost of 1.5 percent was used for all of the regional projects with a not to exceed cost of $500,000. Table 7-3 summarizes the annual maintenance costs. All maintenance will start once the project is constructed.

Table 7-3: Regional Project Annual Maintenance Costs

Regional Project	Annual Maintenance Cost
Darby Park	$74,205
El Segundo Pump Station	$16,290
Ramona Park	$264,345
Jim Thorpe Park	$230,055
Hawthorne Memorial Park	$120,195
Chester Washington Golf Course	$500,000
Harbor City Park	$500,000
Wilmington Recreation Center	$183,825
Averill Park	$323,520
Carriage Crest Park	$131,290
Carson City Hall	$131,290
Alondra Park	$500,000

Distributed BMPs (Green Streets)

A probable cost opinion, similar to those developed for the regional projects, was developed for a 1,000 linear foot section of green street within one lane (0.19 lane miles) and is provided in Attachment U. This unit cost opinion is $478 per lineal foot per lane mile of green streets. Based on the implementation schedule summarized in Section 5, the cost per year of green street implementation is shown in Table 7-4. The green streets will also require some maintenance throughout the year to make sure they function as intended. The annual maintenance cost associated with green streets was estimated to be one percent of the construction cost, which is consistent with general CASQA BMP guidance. The maintenance cost will start once the streets have been constructed and are shown to begin the following year. Annual maintenance costs increase as more green streets are added.

Table 7-4: Green Street Implementation Cost

Implementation Year	Capacity (acre-feet)	Implementation Cost	Annual Maintenance
2017	--	--	--
2018	8.0	$16,705,000	--
2019	8.0	$16,705,000	$167,000
2020	8.0	$16,705,000	$334,000
2021	8.0	$16,705,000	$501,000
2022	8.0	$16,705,000	$668,000
2023	8.0	$16,705,000	$835,000
2024	8.0	$16,705,000	$1,002,000
2025	8.0	$16,705,000	$1,169,000
2026	8.0	$16,705,000	$1,336,000
2027	50.2	$104,414,000	$1,503,000
2028	50.2	$104,414,000	$2,548,000
2029	50.2	$104,414,000	$3,592,000
2030	23.6	$49,068,000	$4,636,000
2031	23.6	$49,068,000	$5,127,000
2032	23.6	$49,068,000	$5,617,000
2033	--	--	$6,108,000
2034	--	--	$6,108,000
2035	--	--	$6,108,000
2036	--	--	$6,108,000
2037	--	--	$6,108,000
2038	--	--	$6,108,000
2039	--	--	$6,108,000
2040	--	--	$6,108,000
2041	--	--	$6,108,000

Additional BMPs

Capital cost for Additional BMPs are presented as an order-of-magnitude cost estimates derived from the detailed regional BMP cost estimates developed for the DC WMG as presented in Appendix U. This pool of detailed cost estimates also includes the concept design of Carriage Crest Park developed for the City of Carson. The cost per volume capacity for additional BMPs was assumed to be $950,000 per acre-foot. An annual maintenance cost of 1.5 percent was used consistent with the assumption used for the Regional Projects presented in Table 7-3.

Drinking Water Aquifer Recharge by Injection Wells

The project cost opinions provided above do not include costs for injecting water into the drinking water aquifers. Because much of the volume reduction proposed is through green streets, and a survey to identify collection points within green streets systems where injection wells can be effectively used has not been completed yet, the number of injection wells and total amount of water that can be feasibly injected is highly uncertain. For this reason, the incremental probable cost opinion for implementing one injection well and the amount of water that injection well can potentially move into the drinking water aquifer is provided in this section.

The probable cost opinion for an injection well is based on the Alamitos and West Coast Seawater Barriers operated by LACDPW along with engineering experience. LACDPW staff suggested that an average injection well can consistently inject at a rate of 0.35 cubic feet per second (cfs). If a well would be sited such that, it would be able to operate constantly for 3 days following a storm (there was that much volume accumulated), this would provide approximately 2 acre-feet of water per well per operational period. Table 7-5 shows the probable cost opinions for such a well based on information provided by LACDPW. Based on the operating history of the LACDPW injection barriers, each well generally needs to be redeveloped every two years and replaced every 25 years due to well degradation that occurs from scaling and other processes. Injected water would need to be filtered to maintain well life to within these parameters. A more detailed probable cost opinion that includes probable opinions of design costs, construction support, and construction costs is provided in Attachment U. Future costs are not discounted to present value and not escalated for inflation.

Table 7-5: Injection Well Cost Summary per Well

Cost Item Description	Total Cost
Engineering, Construction Support, and Construction	$1,000,000
Annual Maintenance of Injection Well	$100,000
Well Redevelopment (every 2 years)	$2,000
Well Head Replacement (every 25 years)	$1,000,000

Opinion of Probable Cost Summary

The probable cost opinions associated with regional and distributed project implementation were placed along the implementation timeline to show a potential future cash flow scenario. All cost opinions are shown in 2014 dollars. Future costs are neither discounted nor escalated. Figure 7-1 shows the probable capital and O&M cost opinions per year based on the implementation schedule. The spike seen in the figure corresponding with 2026 is due to green street implementation. The cost prior to 2026 is associated with the design and construction of regional projects. In 2026, all of the regional projects except for Harbor City Park will be completed and green street implementation will start. Harbor City Park will be completed 2034. The design and construction costs were spread out depending on the amount of time anticipated for the design and construction.

Future replacement costs based on expected useful lives of the systems are not shown in Figure 7-1. Injection well costs are not shown Figure 7-1.

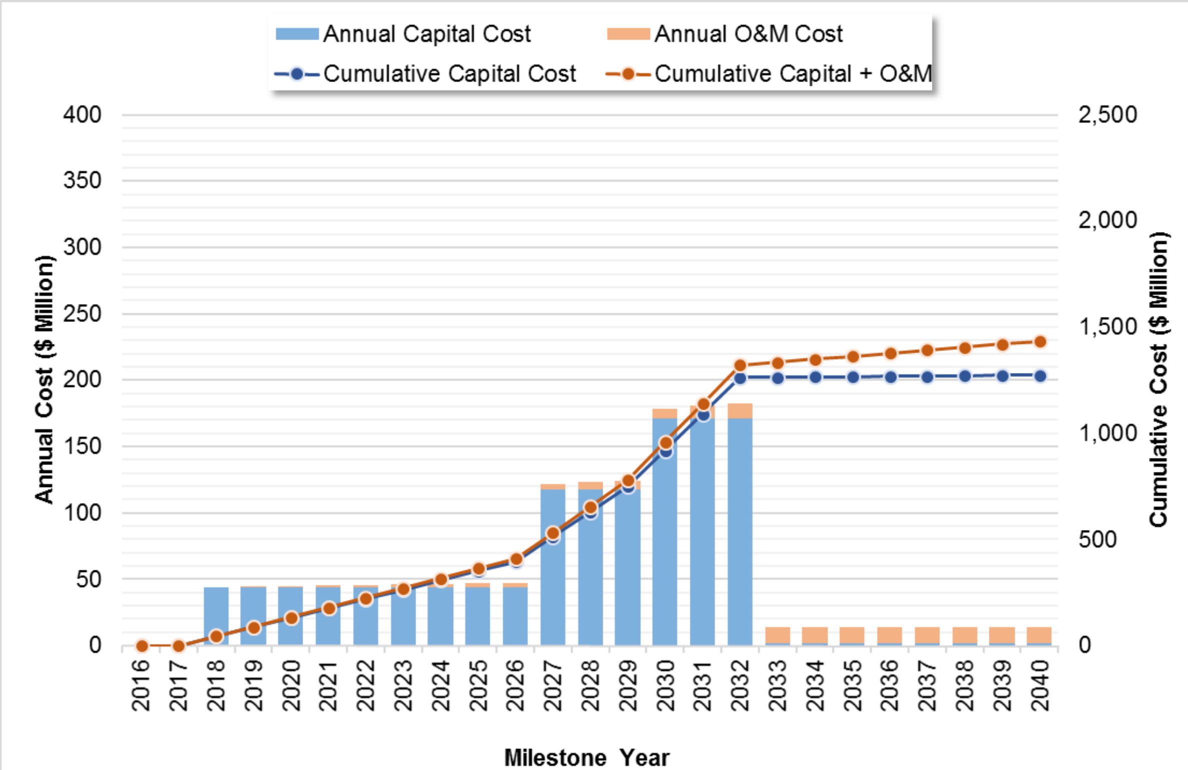

Figure 7-1: Annual Cost for EWMP Implementation

EWMP Costs by Type

The total probable cost opinions by type are shown in Table 7-6.

Table 7-6: Total Estimated EWMP Costs by Type		
Type	**Capital Cost**	**Annual O&M at Build-out**
MCMs	$0	Current budgets
LID + Redevelopment	$0	Current budgets
Green Streets	$610,792,153	$6,107,922
Regional BMPs	$288,155,650	$2,975,015
Other Regional	$350,689,607	$5,260,344
Total	**$1,249,637,410**	**$14,343,281**

EWMP Costs by Jurisdiction

The capital and O&M cost for the proposed control measure implementation based on jurisdiction is summarized in Table 7-7[15]. An annual O&M cost is presented for each jurisdiction and is based on 1.5% of the capital costs of control measures within that jurisdiction. This percentage is similar to the percentage used for the O&M costs of Regional Projects, which is based on the California Stormwater Quality Association (CASQA) BMP Handbooks. Table 7-8 through Table 7-12 identifies the cost per jurisdiction within each of the five analyzed watersheds. The cost for regional projects was shared based on the percent of contributing impervious area in the participating jurisdiction.

[15] Costs presented in Table 7-7 through 7-12 are initial estimates based on project opportunities, and are subject to change based on the adaptive management process. It is the goal of the WMG members to continue to explore cost-effective project opportunities that will reduce overall capital costs for each WMG member. For example, development projects such as the Hollywood Casino or the new NFL stadium (City of Inglewood) will provide opportunities for public-private partnerships or additional cost-effective regional projects and reduce WMG member costs (similar to the Costco regional project in Culver City).

Table 7-7: EWMP Implementation Cost by Jurisdiction

Jurisdiction	Green Streets		Regional Projects		Additional BMPs		Total Capital Cost
	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	
Carson	59.5	$122,593,083	17.7	$17,504,370	100.3	$95,613,319	$235,710,772
El Segundo	2.0	$4,070,949	44.9	$16,546,970	3.3	$3,138,905	$23,756,824
Hawthorne	35.3	$73,369,348	50.1	$48,181,217	23.9	$22,707,161	$144,257,726
Inglewood	44.1	$91,833,924	5.2	$4,947,000	20.4	$19,392,641	$116,173,565
Lawndale	--	--	34.8	$30,089,333	--	--	$30,089,333
Lomita	--	--	49.0	$43,671,631	3.4	$3,201,627	$46,873,258
Los Angeles	96.0	$199,805,063	57.9	$54,909,677	166.2	$157,847,545	$412,562,285
Uninc. County	57.3	$119,119,787	72.9	$72,305,451	51.4	$48,788,409	$240,213,647
Total:	**294.1**	**$610,792,154**	**332.5**	**$288,155,650**	**368.8**	**$350,689,607**	**$1,249,637,410**

Table 7-8: Dominguez Channel Watershed – EWMP Implementation Cost by Jurisdiction

Jurisdiction	Green Streets		Regional Projects		Additional BMPs		Total Capital Cost
	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	
El Segundo	1.96	$4,070,949	44.9	$16,546,970	3.30	$3,138,905	$23,756,824
Hawthorne	35.26	$73,369,348	50.1	$48,181,217	23.90	$22,707,161	$144,257,726
Inglewood	44.13	$91,833,924	5.2	$4,947,000	20.41	$19,392,641	$116,173,565
Lawndale	--	--	34.8	$30,089,333	--	--	$30,089,333
Los Angeles	19.15	$39,852,937	1.3	$1,220,114	26.86	$25,518,818	$66,591,869
Uninc. County	30.37	$63,196,447	63.4	$63,849,646	11.72	$11,135,667	$138,181,760
Total:	**130.9**	**$272,323,605**	**199.7**	**$164,834,280**	**86.2**	**$81,893,192**	**$519,051,077**

Table 7-9: Dominguez Channel Estuary Watershed – EWMP Implementation Cost by Jurisdiction

Jurisdiction	Green Streets		Regional Projects		Additional BMPs		Total Capital Cost
	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	
Carson	59.50	$122,045,086	9.2	$8,752,000	96.49	$91,669,070	$222,466,156
Los Angeles	26.67	$55,493,186	--	--	35.41	$33,639,725	$89,132,911
Uninc. County	25.21	$52,451,742	--	--	37.78	$35,886,308	$88,338,050
Total:	**110.5**	**$229,990,014**	**9.2**	**$8,752,000**	**169.7**	**$161,195,103**	**$399,937,117**

Table 7-10: Wilmington Drain Watershed – EWMP Implementation Cost by Jurisdiction

Jurisdiction	Green Streets		Regional Projects		Additional BMPs		Total Capital Cost
	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	
Carson	--	--	9.0	$8,752,370	0.15	$246,050	$8,998,420
Lomita	--	--	47.5	$42,375,450	0.58	$2,650,538	$45,025,988
Los Angeles	--	--	22.3	$19,866,564	1.37	$4,265,513	$24,132,077
Uninc. County	--	--	9.5	$8,455,805	0.85	$1,061	$8,456,866
Total:	**--**	**--**	**88.3**	**$79,450,189**	**3.0**	**$7,163,162**	**$86,613,351**

Table 7-11: Machado Lake Watershed – EWMP Implementation Cost by Jurisdiction

Jurisdiction	Green Streets		Regional Projects		Additional BMPs		Total Capital Cost
	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	
Carson	--	--	--	--	0.26	$146,737	$146,737
Lomita	--	--	1.5	$1,296,181	2.79	$551,089	$1,847,270
Los Angeles	--	--	--	--	4.49	$1,305,586	$1,305,586
Uninc. County	--	--	--	--	0.00	$809,309	$809,309
Total:	**--**	**--**	**1.5**	**$1,296,181**	**7.5**	**$2,812,721**	**$4,108,902**

Table 7-12: Harbor Watershed – EWMP Implementation Cost by Jurisdiction

Jurisdiction	Green Streets		Regional Projects		Additional BMPs		Total Capital Cost
	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	Volume (ac-ft)	Capital Cost	
Los Angeles	50.20	$104,458,940	34.3	$33,823,000	98.02	$93,117,904	$231,399,844
Uninc. County	1.67	$3,471,598	--	--	1.01	$956,064	$4,427,662
Total:	**51.9**	**$107,930,538**	**34.3**	**$33,823,000**	**99.0**	**$94,073,968**	**$235,827,506**

7.1.2 Existing Stormwater Programs

The DC WMG agencies have been addressing stormwater discharge requirements since adoption of the first phase I NPDES MS4 permit in the early 1990s. They have increased their budgets since that time to meet additional compliance needs. The DC WMG agencies have existing recurring costs associated with stormwater activities in excess of $50M annually (across all watersheds in which they reside). Table 7-13 is a summary listing of current expenditures and associated revenue sources. Given that the DC WMG agencies have, for the most part, implemented enhanced MCMs and have adopted LID ordinances and are administering their new and re-development programs, it is expected that these recurring costs will continue, for the most part, as is. CIMP monitoring costs are not included in Table 7-13 and are not in the EWMP implementation costs. The purpose of this financial strategy is focused on developing a set of funding sources to address the expected additional costs associated with compliance with the new MS4 permit, and is not intended to incorporate the costs of the existing stormwater activities.

Table 7-13: Existing Stormwater Costs

Jurisdiction	Existing Utility? (Yes/No)	Funding Source	Description of Costs	Total Costs ($)
City of Los Angeles	Yes	Stormwater Fee Plan Check and Grants	Management, Outreach, Inspection, Enforcement, Monitoring	~$30M/yr (City Wide; not including Prop O)
Los Angeles County[1]	No	Integrated Funding/Various Sources	Management, Outreach, Inspection, Enforcement, Monitoring	~80M/yr (County wide)
Los Angeles County Flood Control District	Yes[2]	Flood Control Benefit Assessment	Program Management, O&M, Public Outreach, Monitoring	~36M/yr (County wide)
City of Hawthorne	Yes	General Fund	Program Management, Outreach, Administration	~$335,000/yr
City of Inglewood	Yes	Sewer Fund	O&M and Capital, Runoff Investigation	$2.2M/yr
City of El Segundo	Yes	General Fund	O&M and Capital, Outreach, Inspections, Management	~300k/yr
City of Lomita	No	General Fund	Permit Fee, Match Funding for County Projects	~$73,000/yr
City of Carson	No	General Fund, CRA Bonds, Special Funds	Operation and Maintenance, Capital Improvement, Inspection, Administration	~2.9M/yr
City of Lawndale	No	General Fund	Program Management, Outreach, Administration, Inspections	$100,000

[1] The County has an ongoing collective budget of $10.1 million for 140 unincorporated areas. Additional funds for projects are allocated on an annual basis from the General Fund and other sources. In Fiscal Year 2015-16, the total allocation from the General Fund for stormwater management was $23 million. Additional funds from other sources, including the Gasoline Tax, Solid Waste Fund, Prop C, Prop A Local Return Funds, and Measure R, provide for ongoing MCM compliance activities.
[2] The Los Angeles County Flood Control District is, by definition, a utility with a responsibility for draining storm water.

7.2 Financial Strategy

As described in this EWMP, the projects being envisioned represent new infrastructure or modifications to existing infrastructure that will be expected to operate in perpetuity. For example, the County of Los Angeles is preparing a Green Street Strategic Plan. Also, members of the DC WMG are already beginning planning for projects identified in this EWMP. This new infrastructure or increased costs associated with modifying existing infrastructure were not envisioned when the DC WMG agencies were developing their revenue and budget models prior to adoption of the new MS4 Permit. Therefore, the DC WMG agencies do not currently have revenue sources allocated specifically to this new infrastructure. New revenue sources need to be identified, or revenue sources currently allocated to other programs need to be used to fund the implementation of this EWMP. Flexibility in identifying potential funding opportunities will be important for successful financing of EWMP implementation.

7.2.1 Potential Funding Sources

The financial strategy presented in this EWMP outlines a set of approaches that allows each DC WMG agency to select the funding sources that best fit their specific circumstances. Each permittee has different resources as presented in Table 7-13; therefore each permittee will use a different set of options at its disposal. The following are high-level funding sources that can be examined as each permittee moves forward as a group or as individuals. For each source, a brief description is included that describes the funding source, challenges, the potential or feasibility for securing funding under the source, and where possible, an estimate of the available funding from each source. The potential funding sources are categorized by type. Acknowledgement is given to *Stormwater Funding Options – Providing Sustainable Water Quality Funding in Los Angeles County,* a report authored by Ken Farfsing and Richard Watson dated May 21, 2014.

Clean Water State Revolving Fund

The Clean Water State Revolving Fund (CWSRF) is a potential funding source available to individual agencies that could provide low interest loans to fund individual projects or groups of projects. The CWSRF can fund a variety of projects including stormwater measures to manage, reduce, treat, or recapture stormwater or subsurface drainage water; water conservation, efficiency, and reuse; and watershed pilot projects meeting criteria in CWA §122.

Financing terms include interest rates at ½ of the most recent General Obligation Bond Rate at the time of funding approval (1.6% in March 2015) with terms up to 30 years and there is no maximum funding limit. Typically, $200 - $300 million is available annually. However, the State Board estimates financing between $500 and $700 million in projects for FY 2015-16. Repayment begins one year after completion of construction. Funds obtained under the CWSRF could be used for a variety of projects including green streets and regional projects. The CWSRF has high potential as a funding source in the near term (<5 years) as well as in longer term implementation.

One of the challenges in utilizing the CWSRF for project funding is the need to have existing funding streams to pay back the loans. However, if qualifying revenues are identified to cover the cost of the loans in the near term, longer term strategies (e.g., new fee programs) could be developed and implemented to provide the basis for the remainder of the loan.

The City of Los Angeles has begun discussions with CWSRF staff regarding the appropriate approach to submitting a request for funding. As part of preparing for the application for funding, the City of Los Angeles has developed a 5-year Capital Improvement Plan (CIP) that embodies the full range of projects required to comply with stormwater quality regulations and provide flood protection for the City's residents and rate payers. The projects address urban runoff that occurs in wet weather (stormwater) and dry weather (non-stormwater runoff). Overall, the projects in the CIP support a multi-benefit approach to improving stormwater quality while supporting the City's broader water resource initiatives to ensure that water supply benefits are being maximized while also providing flood protection.

Federal and State Grants

Federal and State Grant programs provide potential funding sources for individual agencies or groups of agencies and would typically be used to fund individual projects identified in the EWMP. Project eligibility is dependent on the grant program. For example, $200 million has been dedicated under the Proposition 1 Stormwater Grant Program that will be available for green streets and regional projects. Additional grant funding available under Proposition 1 via other programs may also support EWMP projects such as urban creek restoration projects and IRWMP projects.

Challenges associated with grants include the matching requirements, which can be up to 50% of project costs under Proposition 1, and administration of the grants. Project readiness can be an issue, as many grant programs are focused on implementation of projects, with less money provided for planning needs. Grants are also competitive, with only $200 million available statewide under the Stormwater Grant Program. Given the intensive regulatory pressures on agencies across California, securing this type of funding could prove difficult. Lastly, grants are typically "one time" sources of funding for construction and would not include operations and maintenance costs.

Funds obtained through grant programs could be useful in design and construction of green streets and regional projects. Grants may contain restrictions on use for private property acquisition and it may not be possible to fund projects on private property. While grant programs may be an excellent source of funding for some key projects (rather than overall program implementation), due to the associated challenges, limited funding availability, and sustainability issues, the potential for grants to provide significant support to EWMP needs is minimal in comparison to the overall EWMP costs in the near and longer terms.

Error! Reference source not found. lists grant programs that the DC WMG may consider investigating f or EWMP projects. The programs range from Federal to State programs and can apply to transportation, water supply, water quality, habitat enhancement, recreation, or a range of potential project benefits. **Error! Reference source not found.** shows which project benefit criteria apply most to the different g rant programs. As projects are developed and concepts planned, incorporating the benefits that position them for grants can be beneficial in improving odds at successfully obtaining such funds. Potential financial assistance associated with grants is described in further detail in Attachment V.

The City of Los Angeles is pursuing grant funding for high priority projects in the near term while they seek to identify sustainable sources of funding in the long term for future projects and operation and maintenance related to EWMP implementation.

Table 7-14: Grant and Loan Programs and Project Criteria

Funding Source	**Priority Project Elements**									
	Drought Preparedness	**Increase Local Water Supply**	**Conservation Programs**	**Water Quality**	**Pollution Reduction**	**Flood Management Programs**	**Drinking Water Protection**	**Ecosystem Protection**	**Restoration**	**Public Health/ Environmental Impact**
EPA Section 319				X	X					
Proposition 1:										
Regional Water Security		X		X				X	X	
Flood Management		X		X				X	X	
Clean, Safe, Reliable Drinking Water		X		X			X	X	X	
Water Recycling		X		X				X	X	
Ecosystem and Watershed Protection		X		X				X	X	
Groundwater Sustainability		X		X				X	X	X
Water Storage Capacity		X		X				X	X	
Clean Beaches Initiatives				X	X			X	X	
TIGER Discretionary *				X						
Supplemental Environmental Project Funds:										
Federal			X	X	X					X
State			X	X	X			X	X	

* Transportation projects that are coordinated with interdisciplinary factors including Stormwater and other infrastructure investments

Traditional Fees Based Programs

Traditional fee based programs include modification of existing or establishment of new fee based programs that are familiar to government agencies, including service related fees, property based fees, and special assessment districts. These types of programs have typically been institutionalized in other capacities within local government. Examples of service related fees that could be used to fund portions of stormwater programs include establishment of, or increases to, fees associated with new and redevelopment, drainage or other environmental impacts, solid waste, water conservation, inspections, or storm drain/BMP maintenance. Property-based fees include regular fees associated with land ownership (e.g., stormwater parcel tax) and may be calculated based on factors such as parcel size, impervious surface, land use, water use, or some combination. Special assessment districts would be focused on specific projects or program implementation areas (e.g., Watershed Management Areas) and could be implemented on tax rolls as a secure funding stream for a discrete area (e.g., the land area draining to a retention basin). An example could be the use of Enhanced Infrastructure Finance Districts tailored to the Watershed Management Group, as outlined in recently adopted (2014) California legislation SB628. Another example could be the formation of a Joint Powers Authority (JPA). The City of Los Angeles has conducted a preliminary scoping to assess the efforts that may be needed to evaluate the feasibility of creating new regional funding sources cooperatively implemented via a JPA as a potential approach to focus revenue generation and utilization on a more targeted basis.

With the exception of JPAs, these types of funding sources would typically be pursued within individual agencies, potentially streamlining approval processes and governance. Funding from these types of programs would typically cover project and program costs within individual agencies and revenues would be commensurate with program responsibilities and agency size. Additional funding could be in the tens of millions of dollars annually, depending on the program and the size of the agency.

There are clear challenges to implementation of these programs and individual agencies will have to work with legal counsel to determine the most feasible, appropriate, and beneficial to their respective programs. The most challenging hurdle may be Proposition 218, which requires public approval through a formal ballot initiative for the establishment of new or increases to existing fees associated with stormwater. However, new legislation such as AB2403 may successfully modify the legislative definition of water to include stormwater which could reduce or eliminate the need for a ballot measure to implement stormwater fees. This and other efforts to reform Proposition 218 to include stormwater as a utility may reduce these challenges in the future.

Considering the current Proposition 218 challenges, these funding sources appear to be viable in the longer term, with each source having a high long term potential. However, even in the near term, many agencies may be able to successfully navigate legal constraints, with greater potential for success lying within internal fee based programs. Although perhaps more challenging, property based fees and special assessment districts would have a moderate potential for success in the near term.

The financial strategies DC WMG agencies may consider associated with fees and charges are:

- Use existing revenue streams for stormwater/water supply/flood control projects to support stormwater quality projects as legally allowable.
- AB 2403 – Use new state law to allow water rates to be used for the water supply benefit of stormwater projects as legally allowable.
- Establish a means by which private developers can fund regional or green streets project in lieu of retaining water on private development. To get sufficient benefit from this, the in lieu project would need to get greater water quality benefit than the potential private development project.
- Use solid waste management fees to cover the cost of enhanced street sweeping and other measures to reduce trash for compliance with TMDLs.

- Use water rates to fund programs to reduce irrigated runoff.
- Pursue a proposition 218 compliant stormwater fee or tax initiative (modified after the 2012 Clean Water Clean Beaches Initiative).
- Pursue proposition 218 compliant special product taxes on those projects that result in greater amounts of pollution causing water quality impairments. Examples include pesticides, fertilizers, automobile tires or other automotive products. Use the revenue to fund EWMP projects.

Innovative Regional Funding Sources

Several potential funding sources could be considered through regional or watershed based collaboration between agencies. These funding sources include water quality trading programs, public private partnerships, sales tax measures, and environmental impact fees. The sources could generate longer-term revenue streams for programs and projects.

Water Quality Trading – Water quality trading (WQT) is an innovative market based approach that involves a party facing relatively high pollutant reduction costs compensating another party to achieve less costly pollutant reduction with the same or greater water quality benefit. WQT has the potential to provide benefits to the public and private sectors by creating opportunities to fund costly structural projects more efficiently and at lower costs. The program could fund regional BMPs on public and private property, depending on the design of the program. The concept is founded upon the difference in feasibility and costs to construct BMPs depending on site constraints, with some projects being more challenging (i.e., technically infeasible, cost prohibitive) than others.

The availability of funds is subject to market conditions related to supply and demand. As development/redevelopment rebounds, particularly infill development in dense areas of the watershed, the demand for offsite options, in lieu fee programs, and/or water quality credits could increase. In order for the program to be feasible, the need would be balanced by an availability of local projects that would serve as offsite compliance measures, either from private developers or from municipal agencies (e.g., EWMP projects).

While the concept of WQT is not new and several successful programs have been established across the United States, there are relatively few water quality trading programs that are actively trading water quality credits. Lessons learned and considerations from other programs include substantial up front program development costs related to technical support and stakeholder outreach; significant transaction costs associated with connecting buyer and seller are mostly driven by uncertainty; and ongoing internal administrative and resource demands can be burdensome. However, if the program were developed regionally, some of these challenges may be reduced through economies of scale.

Due to the significant technical, administrative, and legal undertakings to establish a WQT program, it could be a viable source for funding regional projects, but would likely not be able to contribute significantly to funding needs in the near term. Such a program appears to be more feasible in the long term.

Public Private Partnerships – Public-private partnerships (P3s) are contractual agreements between the public and private sectors that could allow for greater private sector participation in the financing, construction, and operation of watershed projects. While the concept is relatively new to the watershed management sector, P3s are active in other disciplines, supporting transportation, water, and wastewater infrastructure projects, health care, building construction, power, parks and recreation, and technology. P3s may be a potential funding source for green streets projects, regional projects, and projects on private property.

P3 projects can provide the agency the ability to combine existing sources of revenue with new financing resources such as private commercial debt, increasing the ability of the agency to fund much needed projects, while reducing the burden on local resources. Benefits of P3s can include expedited completion of projects, cost savings, improved quality and system performance, use of private resources and personnel, and access to new sources of private capital. P3s also allow an agency to better manage risk associated with the project(s) by placing more responsibility onto the private sector partner. In this context, there may be the potential for the private sector to somewhat offset regulatory risk.

P3s represent a largely unexplored resource within the stormwater sector and have the potential to provide financing for projects and programs. Anticipated challenges include initial development of programs, identification and mitigation of institutional constraints, availability of investors with the expertise in the field, identification of opportunities, and understanding legal implications. Additionally, where projects do not produce revenue (i.e., those without long term funding sources such as fee programs), investors will likely be less interested. Considering the challenges and relative infancy of P3 funding within California, P3s may have more potential as a funding mechanism in the long term rather than in the near future.

The relationship that Culver City has developed with Costco in the Marina del Rey Watershed is a good example of recent advances in P3 funding. Although not in the DC watershed, this project may be used as a model for the development of future partnerships in this watershed.

Regional Sales Tax Measures, Environmental Impact Fees – Increases in sales tax or the imposition of environmental impact fees have the potential to provide significant levels of funding to local programs. Sales tax measures could fund LID, greens streets, and regional BMPs, whereas environmental impact fees may be more limited to larger projects (e.g., green streets, regional BMPs).

Sales tax measures could be implemented by jurisdiction or regionally, but would likely need extensive outreach to gain voter approval. Environmental impact fees associated with products that contribute to water quality issues would likely originate at the state level. Examples of products include residential pesticides contributing to aquatic toxicity or automobile tires contributing to heavy metals. Either funding source would potentially take years to move forward through the legislative processes. While these sources are viable solutions and have the potential to provide funding in the millions of dollars annually, the legislative process makes them more feasible as long term solutions.

Legislative and Policy

Several of the funding sources that DC WMG agencies may consider will require legislative or policy changes. These options are summarized below:

- Lobby the Metropolitan Water District (MWD) of Southern California to reevaluate their approach for managing the Local Resource Program (LRP) to fund stormwater capture and use projects that offset the use of imported water supplies. This is related to a water rate increase in that MWD would incorporate the costs into their imported water rates.
- Pursue pollutant source control legislation patterned after SB 346 that either limits pollutants of concerns in products (e.g. copper in brake pads, or zinc in tires) or assesses a fee on those products that can be used by local governments to mitigate those pollutants.
- 2014 Water Resources Reform and Development Act of 2014 (WRRDA). Partner with USACE to model the watershed impervious surface effects on the federal interests under WRRDA to secure USACE cost sharing for EWMP programs.

7.2.2 Applicability and Prioritization

Based on available funds, the near and long term potential or feasibility of the funding sources, and on the applicability of the funding sources to the types of BMPs identified in the EWMP, the preferred funding sources can generally be prioritized for each BMP type. The funding sources for each BMP type are ranked in general order of preference in Table 7-15 and Table 7-16. The funding sources, associated BMPs, near/long term feasibility (less or greater than five years, respectively, to establish the funding source), and ranges of potential funding available are summarized in Table 7-17. The ranges of potential funding available are broad estimates for the watershed on an annual basis once a funding source is fully implemented and will vary depending on the approach and methods of implementation, scale/service area, legal constraints, and public/political acceptance.

Table 7-15 Green Streets Projects Funding Sources Prioritization

Funding Source	Estimate of Potential Annual Available Funding in the Watershed	Scope/ Scale		Potential/ Feasibility	
		Project	Program	Near Term (<5 years)	Long Term (>5 years)
Clean Water State Revolving Fund[1]	$$$$	●	●	High	High
Service Related Fees[1]	$-$$		●	High	High
Federal/ State Grants[1]	$	●		Moderate	Moderate
Property Based Fees[1]	$$-$$$		●	Moderate	High
Special Assessment Districts[1]	$$-$$$	●	●	Moderate	High
Public Private Partnerships	$	●	●	Low	Moderate
Sales Tax Measure[1]	$-$$		●	Low	Moderate
Environmental Impact Fees[1]	$-$$		●	Low	Moderate

1. Subject to local, state, and federal restrictions on use of funds. May not be eligible for property acquisition.

Available Funding Key:
$ = $1-5M
$$ = $5-25M
$$$ = $25-100M
$$$$ = >$100M

Table 7-16 Regional Projects Funding Sources Prioritization					
Funding Source	Estimate of Potential Annual Available Funding in the Watershed	Scope/ Scale		Potential/ Feasibility	
		Project	Program	Near Term (<5 years)	Long Term (>5 years)
Clean Water State Revolving Fund[1]	$$$$	●	●	High	High
Federal/ State Grants[1]	$	●		Moderate	Moderate
Property Based Fees[1]	$$-$$$		●	Moderate	High
Special Assessment Districts[1]	$$-$$$	●	●	Moderate	High
Water Quality Trading	$-$$	●	●	Low	Moderate
Public Private Partnerships	$	●	●	Low	Moderate
Sales Tax Measure[1]	$-$$		●	Low	Moderate
Environmental Impact Fees[1]	$-$$		●	Low	Moderate

1. Subject to local, state, and federal restrictions on use of funds. May not be eligible for property acquisition.

Available Funding Key:
$ = $1-5M
$$ = $5-25M
$$$ = $25-100M
$$$$ = >$100M

The funding sources, associated BMPs, near/long term feasibility (less or greater than five years, respectively, to establish the funding source), and ranges of potential funding available are summarized in Table 7-17.

Table 7-17 Funding Sources Summary

Funding Source	Estimate of Potential Annual Available Funding in the Watershed	Scope/ Scale		Potential/ Feasibility	
		Project	Program	Near Term (<5 years)	Long Term (>5 years)
Clean Water State Revolving Fund[1]	$$$$	●	●	High	High
Federal/ State Grants[1]	$	●		Moderate	Moderate
Service Related Fees[1]	$-$$		●	High	High
Property Based Fees[1]	$$-$$$		●	Moderate	High
Special Assessment Districts[1]	$$-$$$	●	●	Moderate	High
Water Quality Trading	$-$$	●	●	Low	Moderate
Public Private Partnerships	$	●	●	Low	Moderate
Sales Tax Measure[1]	$-$$		●	Low	Moderate
Environmental Impact Fees[1]	$-$$		●	Low	Moderate

1. Subject to local, state, and federal restrictions on use of funds. May not be eligible for property acquisition.

Available Funding Key:
$ = $1-5M
$$ = $5-25M
$$$ = $25-100M
$$$$ = >$100M

The above tables represent a general prioritization of the identified funding sources available to the Permittees and will be used as a general guide for individual agencies to support their needs with respect to the EWMP projects. The agencies will consider the types of projects and programs they need to develop, the amount of funding needed, and the various factors presented above to develop their individual selection and prioritization of funding sources specific to their agency.

7.2.3 Near Term Projects

Ten regional projects are identified for construction prior to 2026, with two additional projects constructed prior to 2040. All are regional BMPs with infiltration as the primary retention and treatment mechanism. Treatment areas for these projects range from approximately 100 acres to 4,500 acres. All regional projects are sited on publicly owned parcels and are the highest priority for implementation. Regional projects identified in the DC watershed and responsible agencies are described in Section 4.2. Although funding for design and construction has not been identified for all signature projects, agencies are pursuing various funding sources. The process for securing the funding includes several steps:

- An evaluation of the agency specific funding need for each project;
- A prioritization of funding sources depending on the needs; and
- Pursuing the selected funding source(s).

Consistent with prioritized funding sources for regional projects, preferred funding sources for these projects include the loans through the CWSRF, Federal and/or State Grants, property based fees, and/or special assessment districts. The process for obtaining funds through the CWSRF is:

1. Agency submits an application for financial assistance to the State Water Board using the Financial Assistance Application Submittal Tool (FAAST) system. The initial application consists of general, financial, technical, and environmental components.

2. Upon receipt of a complete application, the State Division of Financial Assistance (DFA) reviews the application for project scope, budget, and timeline, and if acceptable, adds the project to the project list.

3. Once the application review is complete, DFA prepares an initial Financial Assistance Agreement based on estimated construction costs. At this stage, soft costs, including those incurred prior to the agreement are eligible for re-imbursement.

4. The Agency submits the Final Budget Approval package once the project has been bid and construction costs finalized.

5. The initial Financial Assistance Agreement is then updated with the construction costs and executed. Upon execution, construction costs are eligible for re-imbursement.

6. Based on the Final Budget Approval package, a construction completion date is established, which sets the initial date for repayment, one year from the construction completion date. Upon project completion, the agency would submit a final project report.

The process to obtain Federal and State Grant Funds is similar. Projects that have completed preliminary design are more likely to receive funding for construction. In the near term, agencies are anticipating Round 1 solicitation for Proposition 1 stormwater grant funds in the spring of 2016 and are currently preparing preliminary project designs. In order to be eligible, the approved EWMP will have to meet the Stormwater Resource Plan guidelines adopted by the State Board in December 2015 and will have to be incorporated into the IRWMP. Where this integration has occurred, projects may be eligible for funding under the Proposition 1 Stormwater Grant Program. Upon solicitation, project applications detailing project design, environmental needs, multiple benefits, and agency matching funds will be completed through the FAAST system. Upon award, applicants will enter into funding agreements with the State Board and typically have three years to construct the projects.

Property based fees and special assessment districts will take considerably more effort to implement. Agencies are currently investigating the potential for property based fees and special assessment districts on a regional scale, but are currently subject to Proposition 218 restrictions. As legislation progresses to ease the Proposition 218 restrictions, agencies may be able to implement these types of funding sources through internal process such as ordinance modifications and approval by their governing body. Until then, these types of funding sources will require explicit public concurrence.

7.2.4 Potential Future Steps

The financial strategy discussed herein outlines an approach to utilize multiple options for funding individual projects and the overall EWMP program. Potential future steps to support execution of the financial strategy include:

- Development of public support for executing the financial strategy through outreach efforts. The outreach efforts would build on the recommendations in the Stormwater Funding Options Report (Farfsing, Watson, 2014) which include:
    - Improvement of existing public education and outreach programs to make a more direct connection with residents, the business community, and others regarding stormwater program requirements and funding issues.
    - Outreach to the public, school districts, state, and federal officials.
    - Communication with the governor and legislature on the need for additional funding opportunities to address stormwater issues.
    - Outreach to the area's Congressional delegation to provide education on stormwater and urban runoff issues; consistent and coordinated action in requesting federal funding assistance.
    - Encourage the incorporation of the best science into the Basin Plan.
    - Active participation in the design of future bond programs to ensure additional funding is provided for stormwater and urban runoff programs.
- Creation of inter-jurisdiction EWMP financial working group. Local agencies will reconvene the City Managers Work Group in early 2016 to continue to develop viable funding alternatives for stormwater programs and projects. The group serves at the direction of the City Managers Committees of the California Contract Cities Association and the League of California Cities, Los Angeles County division. Future efforts will be an outgrowth of the recommendations in the Stormwater Funding Options Report (Farfsing, Watson, 2014).
- Development of a financial plan which could include the following components: implementation of a new fee or charge, establishment of a new enterprise fund, cash and debt financing, operating and capital reserves, and cash flow modeling. As described above, the City Managers Work Group will reconvene in 2016 and will be further developing funding options and outlining steps to support implementation. The group will be working to address recommendations related to legislation (e.g., the use of state facilities, capture and use, source control, establishment of special assessment districts), developing a regional stormwater quality fee, and implementing local funding options. Next steps at each level – legislation, regional stormwater quality fee, and local funding – will explore the necessary actions to implement new fees or charges, establish new enterprise funds, and options for cash and debt financing.

8. Legal Authority

As part of the Standard Provisions of the MS4 Permit, Permittees must demonstrate through a certified statement annually that their legal authority to implement and enforce the requirements of the order exists. Legal authority is described in the MS4 Permit (Part VI.A.2, pages 39-41) as follows:

a. Each Permittee must establish and maintain adequate legal authority, within its respective jurisdiction, to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize or enable the Permittee to:

i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.

ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A;

iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4;

iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders;

vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees;

viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation;

ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4;

x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations;

xi. Require that structural BMPs are properly operated and maintained; and

xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.

Each of the DC WMG agencies has provided their latest certified statement for inclusion in Attachment W for reference.

9. References

AMEC Earth & Environmental, Inc. 2003. Supplemental Report Consolidated Slip Restoration Project Concept Plan. Prepared for Regional Water Quality Control Board Los Angeles Region and the Port of Los Angeles.

AMEC. 2011. Port of Los Angeles Dominguez Channel and Consolidated Slip Erosion Study Chemistry EDDs.

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Attachment A

LACFCD Background

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This attachment provides background information pertaining to the Los Angeles County Flood Control District (LACFCD), and their involvement in the Dominguez Channel Watershed Management Group (DC WMG) Enhanced Watershed Management Program (EWMP), supplemental to the EWMP Work Plan.

In 1915, the Los Angeles County Flood Control Act established the LACFCD and empowered it to manage flood risk and conserve stormwater for groundwater recharge. In coordination with the United States Army Corps of Engineers the LACFCD developed and constructed a comprehensive system that provides for the regulation and control of flood waters through the use of reservoirs and flood channels. The system also controls debris, collects surface storm water from streets, and replenishes groundwater with stormwater and imported and recycled waters. The LACFCD covers the 2,753 square-mile portion of Los Angeles County south of the east-west projection of Avenue S, excluding Catalina Island. It is a special district governed by the County of Los Angeles Board of Supervisors, and its functions are carried out by the Los Angeles County Department of Public Works. The LACFCD service area is shown in Figure A.1**Error! Reference source not found.**. The LACFCD territory within the DC WMG is shown in Figure A.2.

Unlike cities and counties, the LACFCD does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The LACFCD operates and maintains storm drains and other appurtenant drainage infrastructure within its service area. The LACFCD has no planning, zoning, development permitting, or other land use authority within its service area. The Permittees that have such land use authority are responsible under the MS4 Permit for inspecting and controlling pollutants from industrial and commercial facilities, development projects, and development construction sites. (MS4 Permit, Part II.E, page 17.)

The MS4 Permit language clarifies the unique role of the LACFCD in storm water management programs: "[g]iven the LACFCD's limited land use authority, it is appropriate for the LACFCD to have a separate and uniquely-tailored storm water management program. Accordingly, the storm water management program minimum control measures imposed on the LACFCD in Part VI.D of this Order differ in some ways from the minimum control measures imposed on other Permittees. Namely, aside from its own properties and facilities, the LACFCD is not subject to the Industrial/Commercial Facilities Program, the Planning and Land Development Program, and the Development Construction Program. However, as a discharger of storm and non-storm water, the LACFCD remains subject to the Public Information and Participation Program and the Illicit Connections and Illicit Discharges Elimination Program. Further, as the owner and operator of certain properties, facilities and infrastructure, the LACFCD remains subject to requirements of a Public Agency Activities Program." (MS4 Permit, Part II.F, page 18).

Consistent with the role and responsibilities of the LACFCD under the MS4 Permit, the EWMPs and Coordinated Integrated Monitoring Programs (CIMPs) reflect the opportunities that are available for the LACFCD to collaborate with Permittees having land use authority over the subject watershed area. In some instances, the opportunities are minimal, however the LACFCD remains responsible for compliance with certain aspects of the MS4 Permit as discussed above.

In some instances, in recognition of the increased efficiency of implementing certain programs regionally, the LACFCD has committed to responsibilities above and beyond its obligations under the 2012 MS4 Permit. For example, although under the 2012 MS4 Permit the Public Information and Participation Program (PIPP) is a responsibility of each Permittee, the LACFCD is committed to implementing certain regional elements of the PIPP on behalf of all Permittees at no cost to the Permittees. These regional elements include:

- Maintaining a countywide hotline (888-CLEAN-LA) and website (www.888cleanla.com) for public reporting and general stormwater management information at an estimated annual cost of $250,000. Each Permittee can utilize this hotline and website for public reporting within its jurisdiction.

- Broadcasting public service announcements and conducting regional advertising campaigns at an estimated annual cost of $750,000.
- Facilitating the dissemination of public education and activity specific stormwater pollution prevention materials at an estimated annual cost of $100,000.
- Maintaining a stormwater website at an estimated annual cost of $10,000.

The LACFCD will implement these elements on behalf of all Permittees starting July 2015 and through the MS4 Permit term. With the LACFCD handling these elements regionally, Permittees can better focus on implementing local or watershed-specific programs, including student education and community events, to fully satisfy the PIPP requirements of the 2012 MS4 Permit.

Similarly, although water quality monitoring is a responsibility of each Permittee under the 2012 MS4 Permit, the LACFCD is committed to implement certain regional elements of the monitoring program. Specifically, the LACFCD will continue to conduct monitoring at the seven existing mass emissions stations required under the previous Permit. The LACFCD will also participate in the Southern California Stormwater Monitoring Coalition's Regional Bioassessment Program on behalf of all Permittees. By taking on these additional responsibilities, the LACFCD wishes to increase the efficiency and effectiveness of these programs.

Figure A.1: LACFCD Service Area

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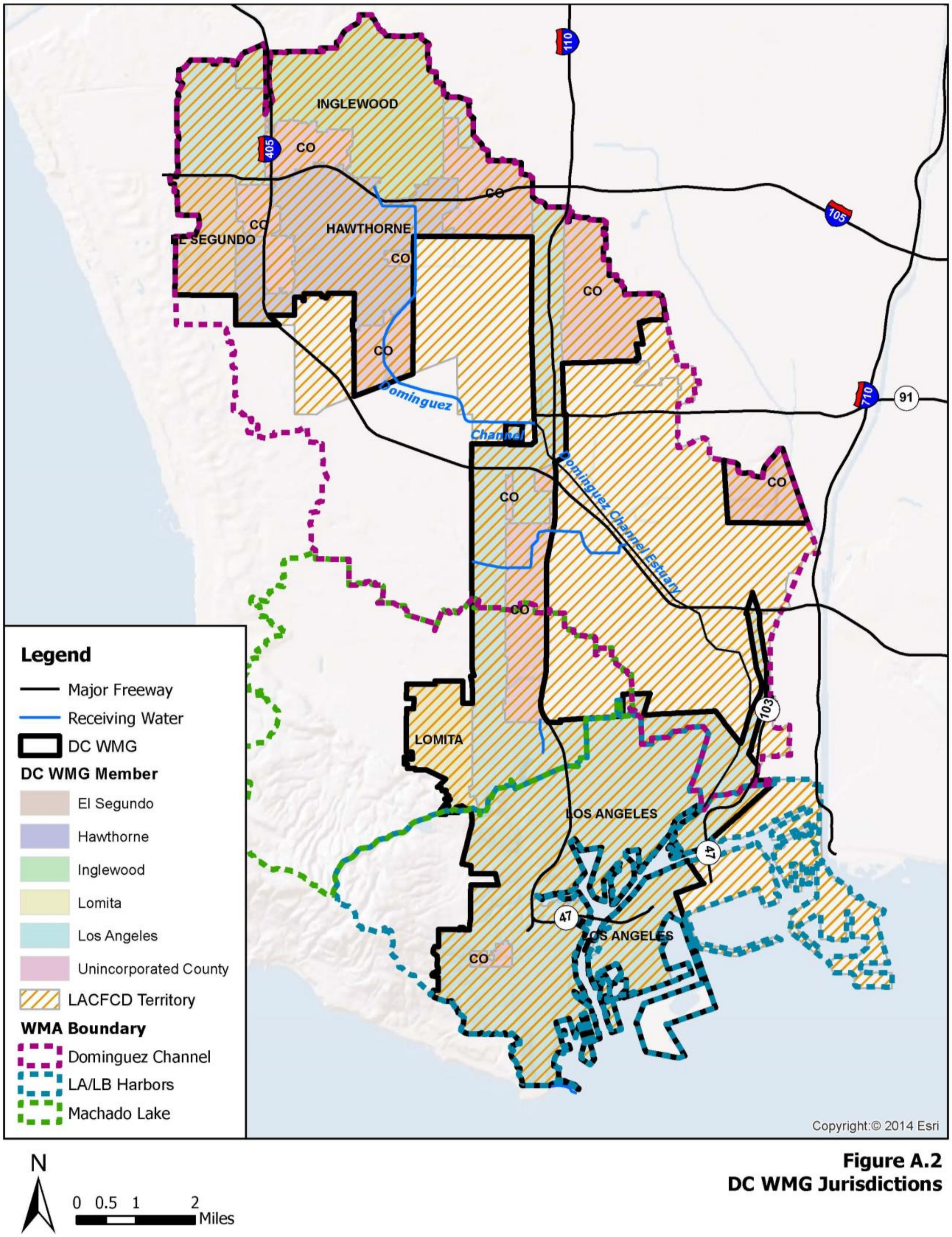

Figure A.2: DC WMG Jurisdictions

Attachment B

Introduction Figures

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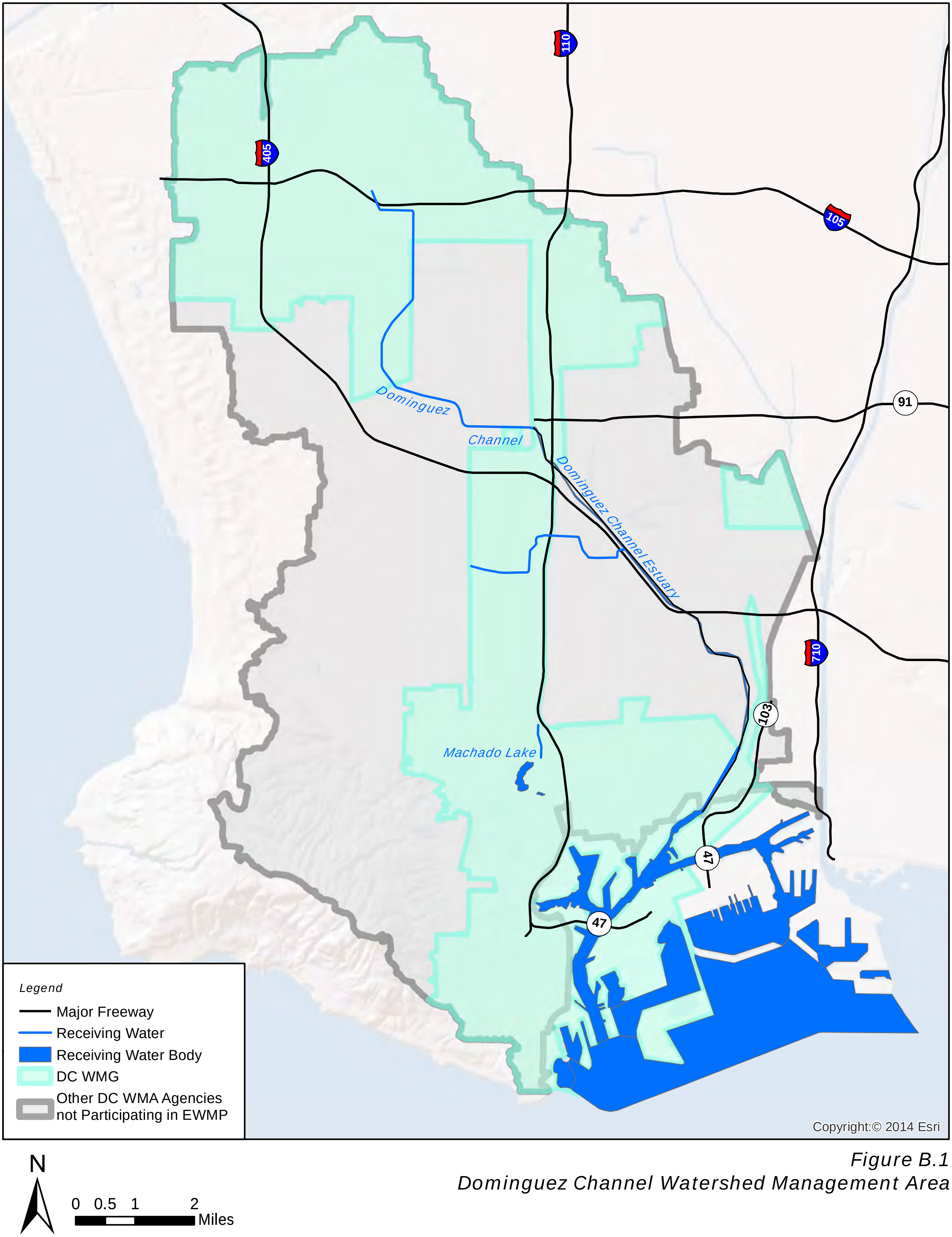

Figure B.1
Dominguez Channel Watershed Management Area

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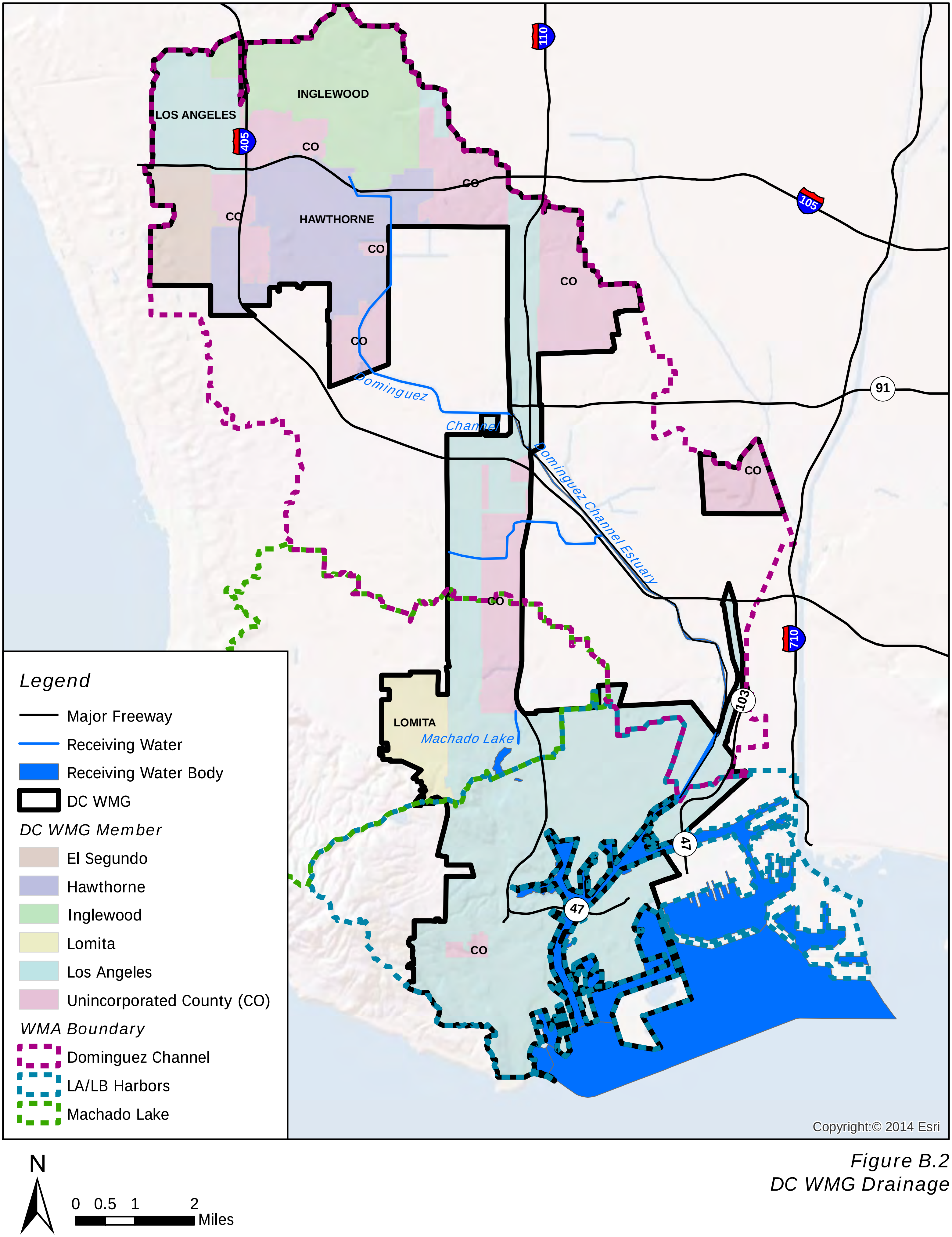

Figure B.2
DC WMG Drainage

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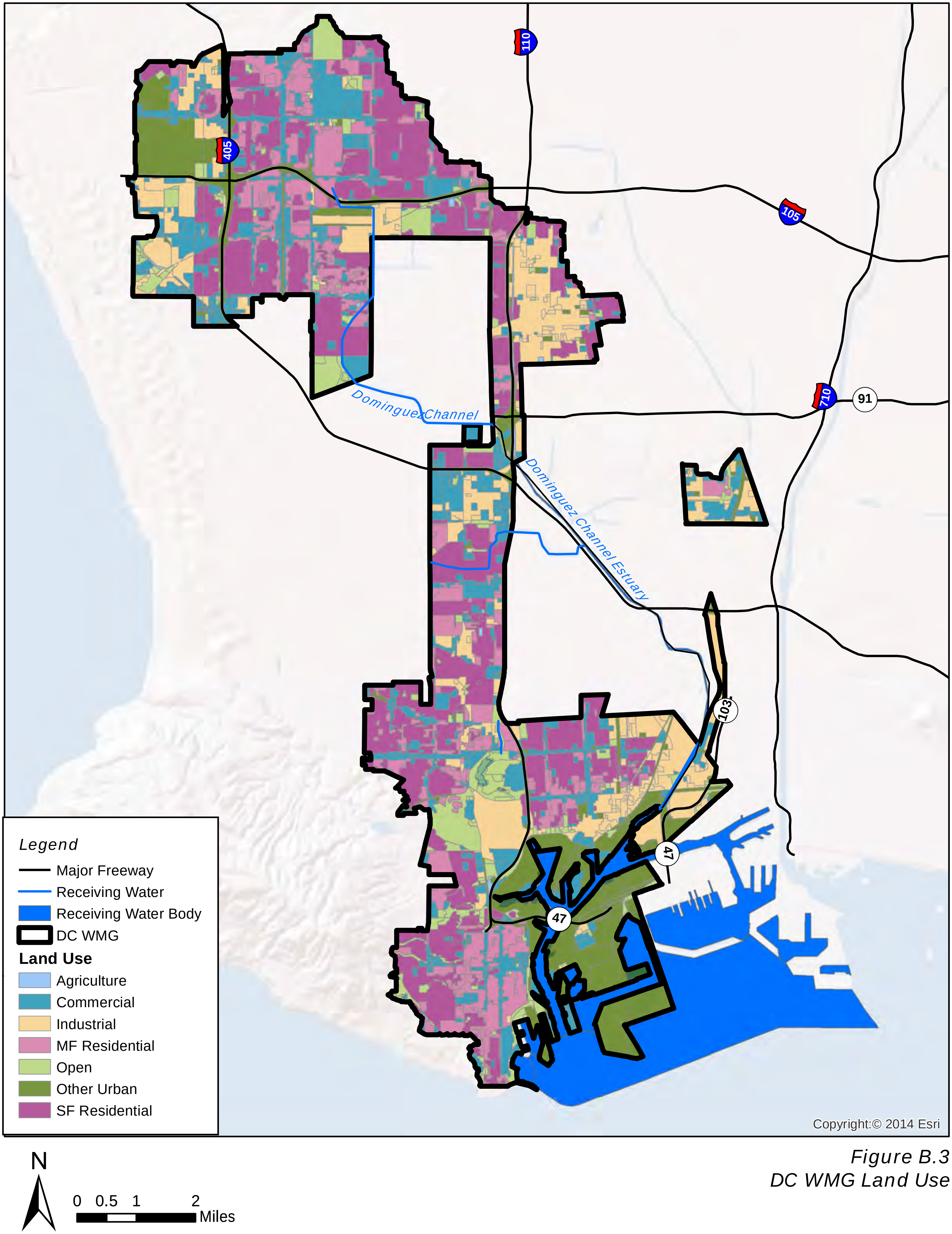

Figure B.3
DC WMG Land Use

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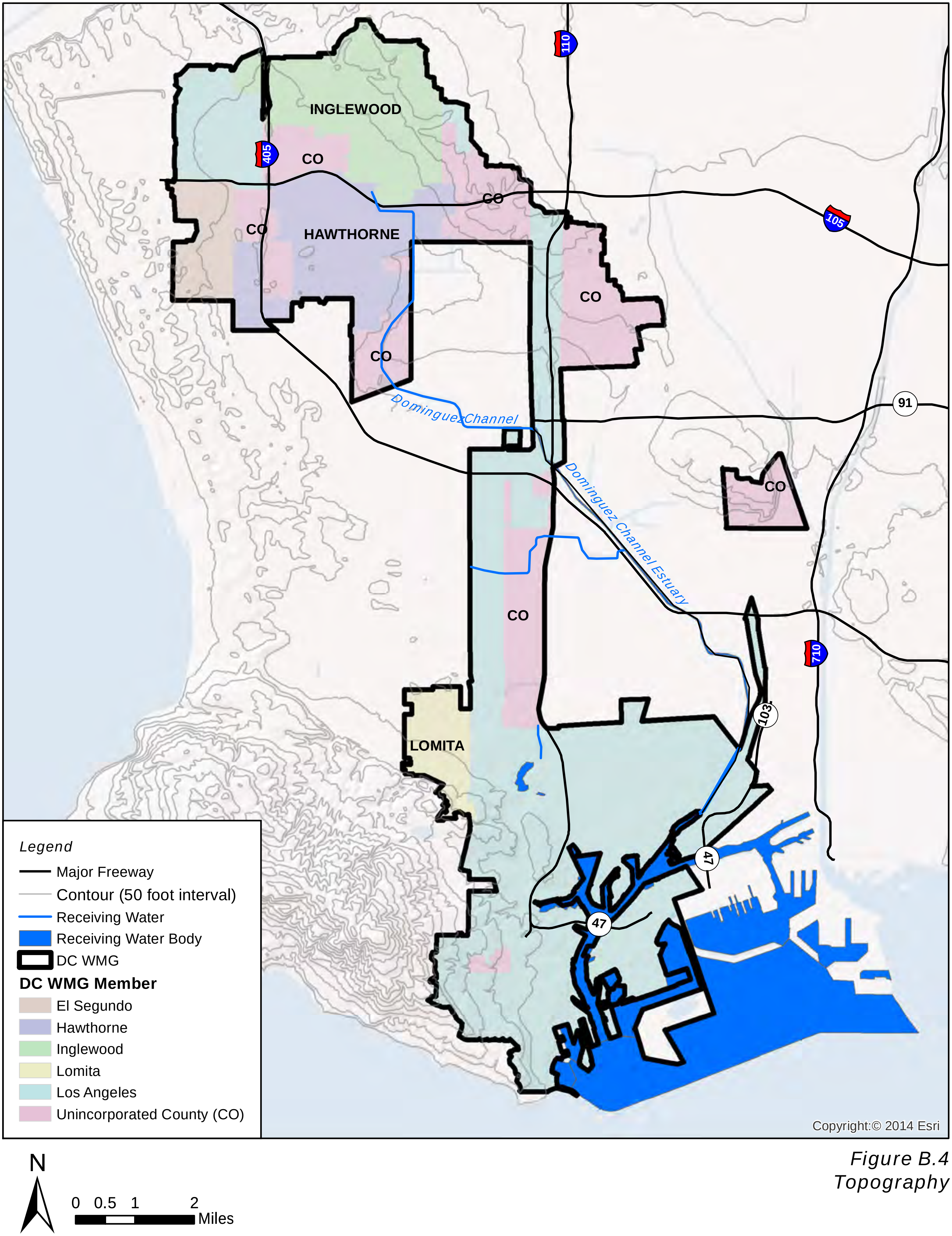

Figure B.4
Topography

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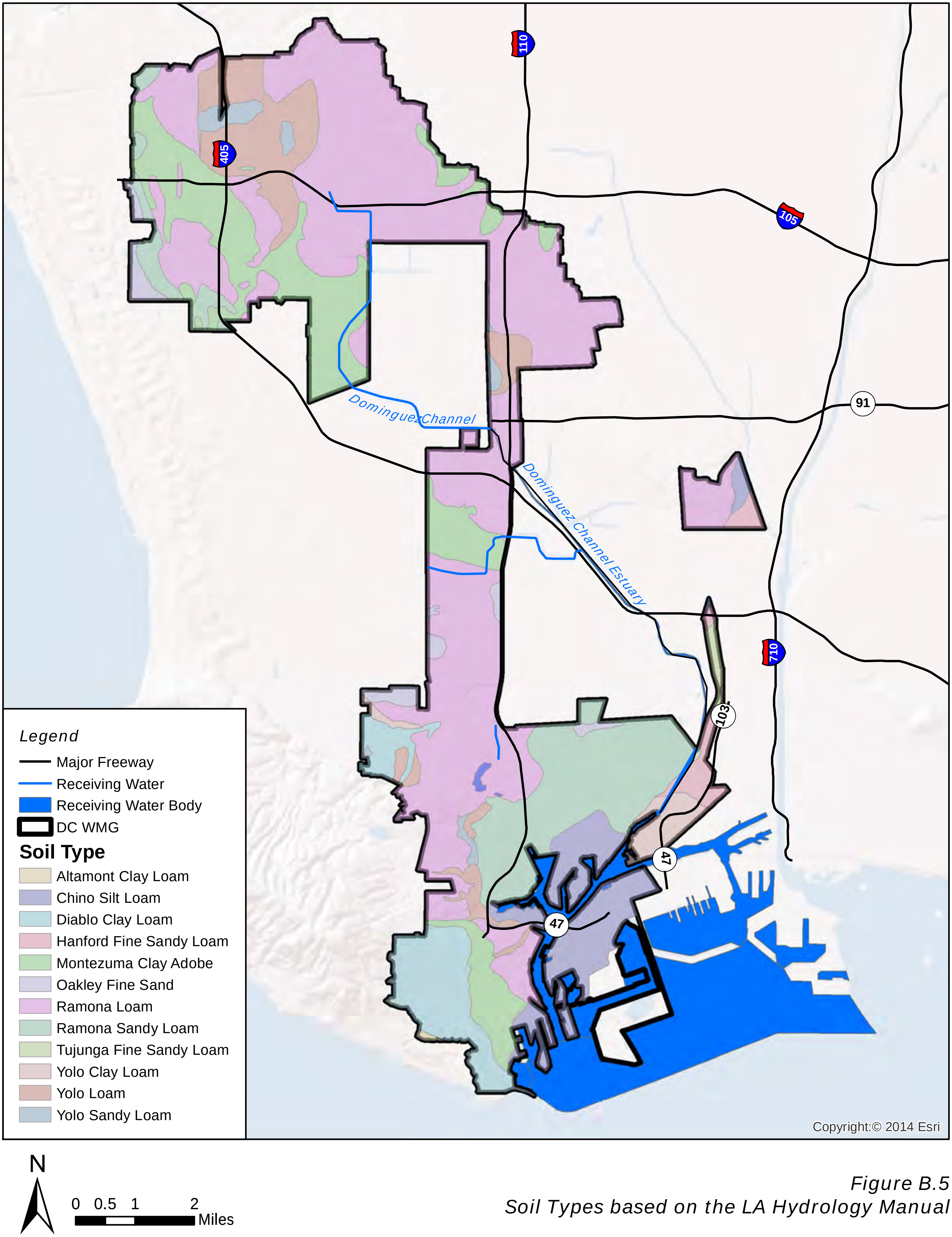

Figure B.5
Soil Types based on the LA Hydrology Manual

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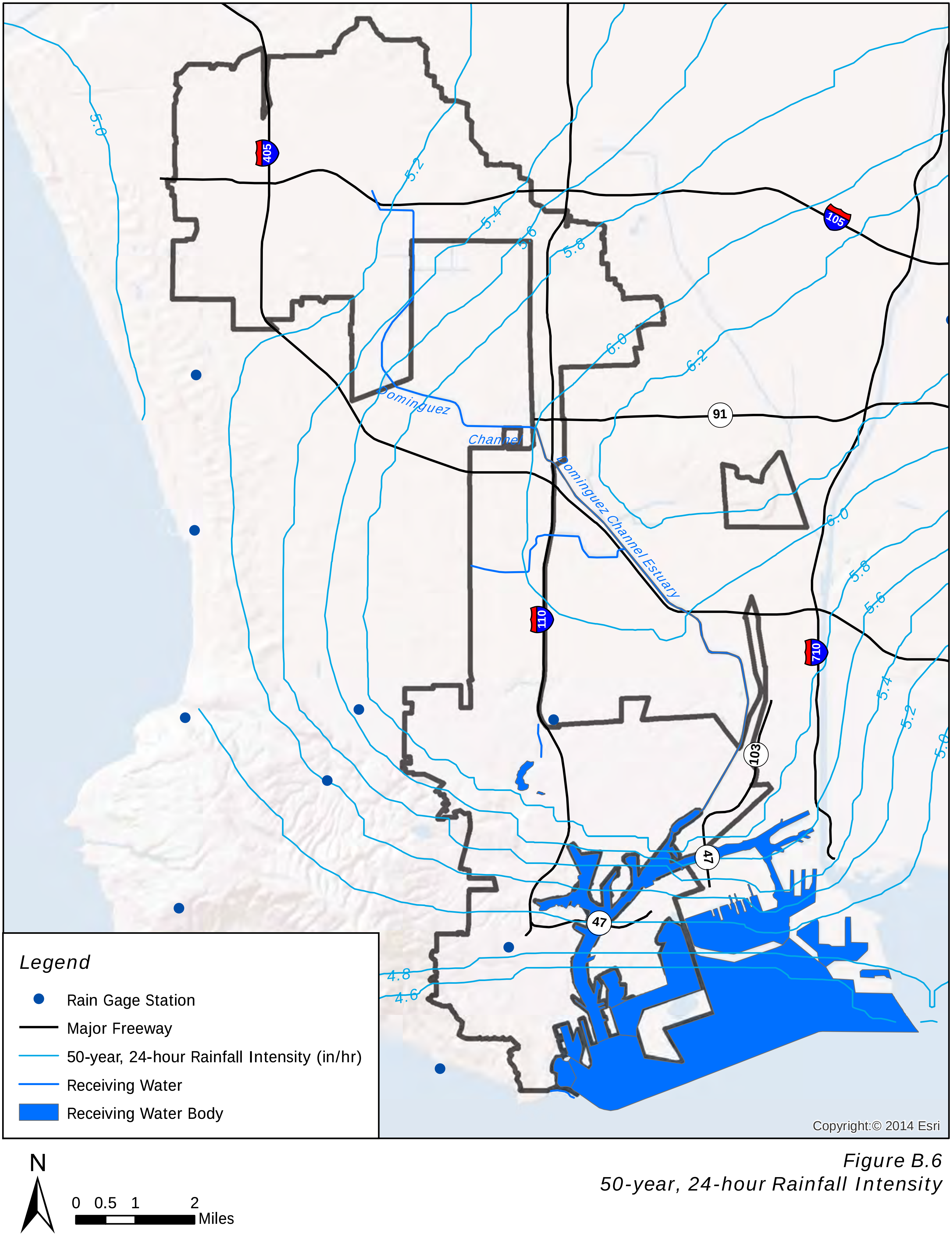

Figure B.6
50-year, 24-hour Rainfall Intensity

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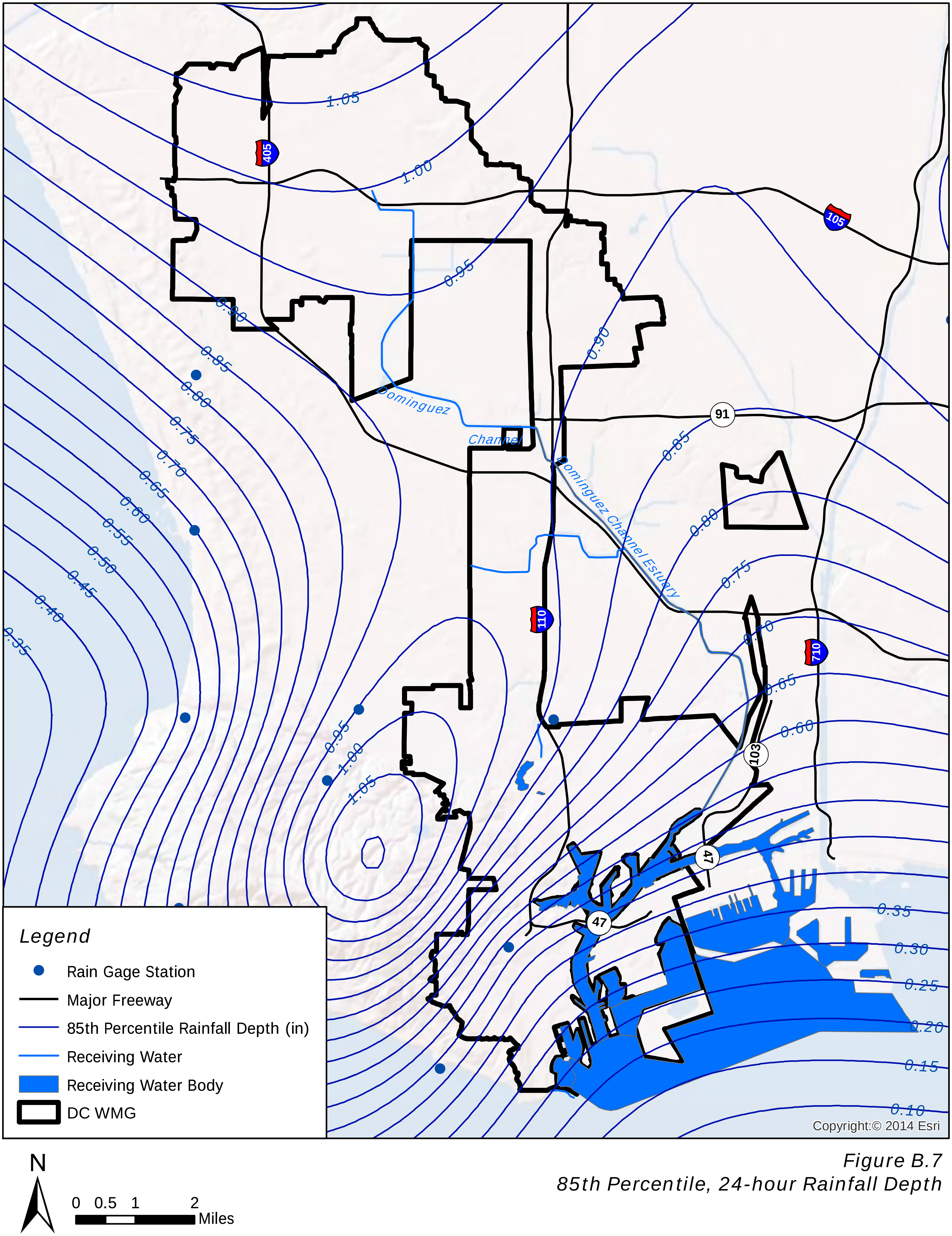

Figure B.7
85th Percentile, 24-hour Rainfall Depth

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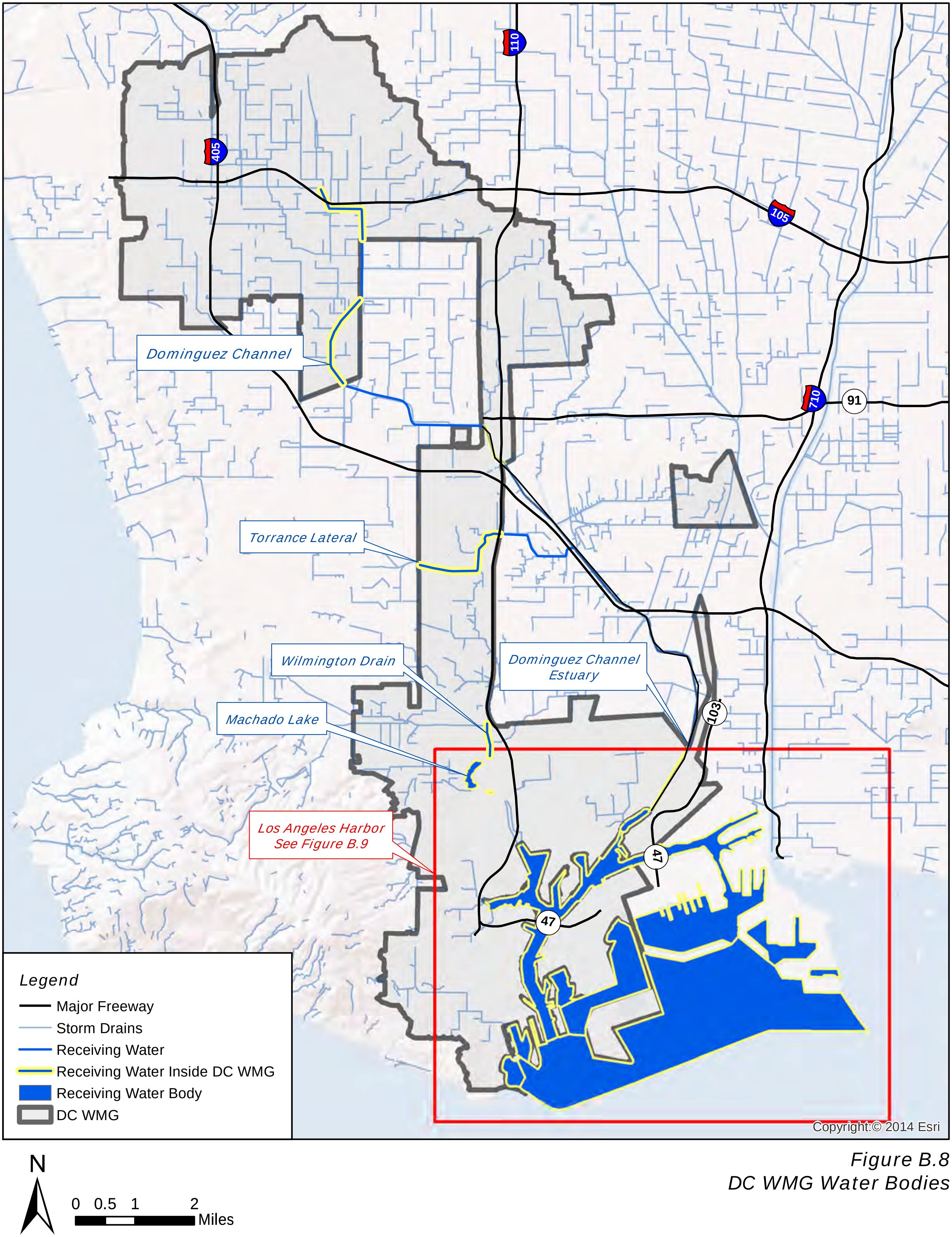

Figure B.8
DC WMG Water Bodies

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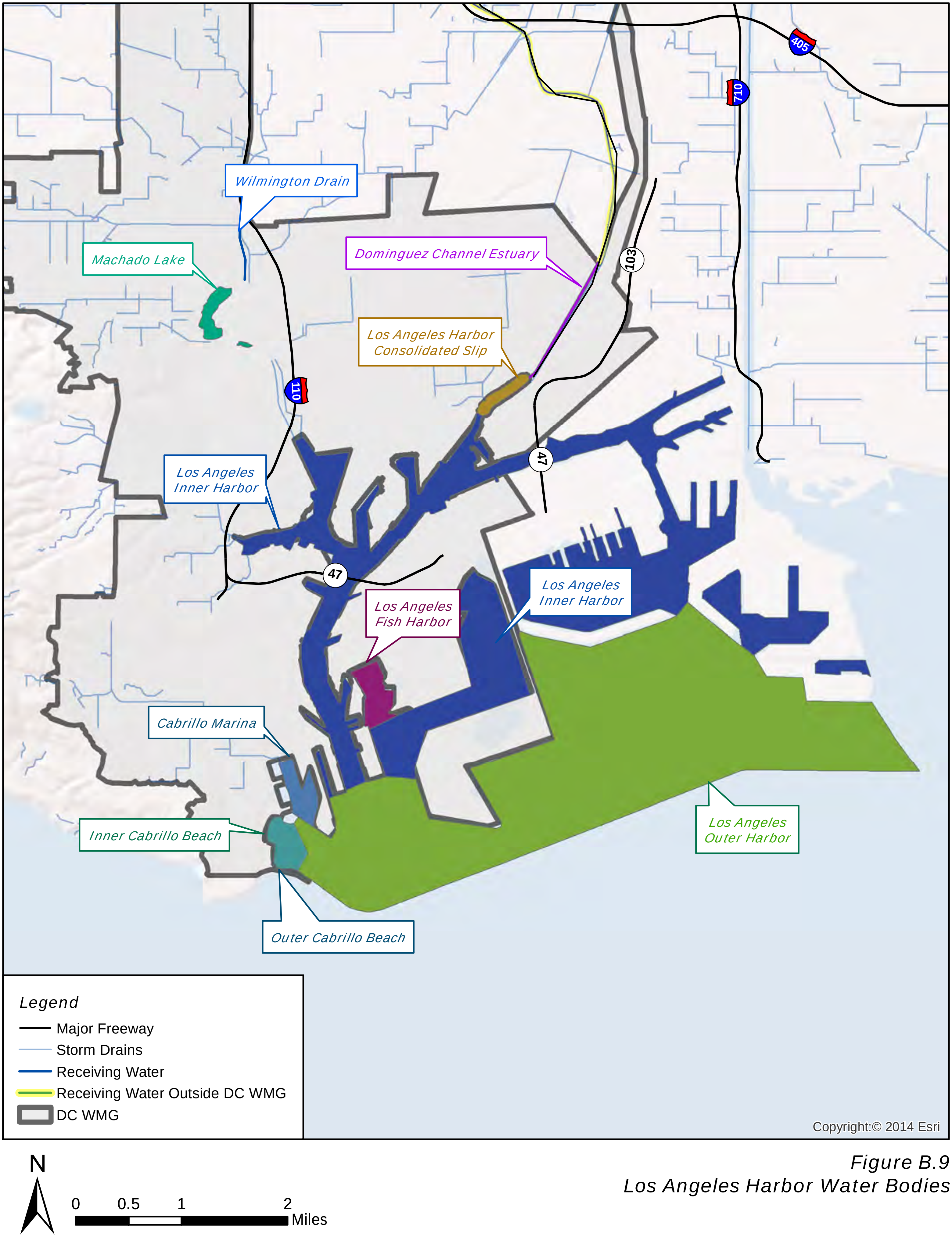

Figure B.9
Los Angeles Harbor Water Bodies

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Attachment C

DC WMG TMDL Requirements

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This attachment includes tables summarizing the existing Total Maximum Daily Load (TMDL) requirements relevant to the Dominguez Channel Watershed Management Group (DC WMG), corresponding with Section 1.3.1 of the DC WMG Enhanced Watershed Management Program (EWMP). The following TMDL water quality objectives are outlined in this attachment:

- Los Angeles Harbor Bacteria TMDL (Inner Cabrillo Beach and Main Ship Channel);
- Machado Lake Trash TMDL;
- Machado Lake Nutrient TMDL;
- Machado Lake Pesticides and PCBs TMDL; and
- Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL (DC and LA Harbor Toxic Pollutants TMDL).

Attachment C List of Tables

Table C.1 demonstrates which DC WMG members are affected by each of the TMDLs per Attachment K, Table K-4, of the Los Angeles County Municipal Separate Storm and Sewer System (MS4) Permit.

As recognized by the footnote in Attachment K-4 of the Permit, the County of Los Angeles, the Los Angeles County Flood Control District (LACFCD), and the Cities of El Segundo, Hawthorne, Inglewood, and Los Angeles have entered into an Amended Consent Decree with the United States and the State of California, including the Regional Board, pursuant to which the Regional Board has released the DC WMG members from responsibility for Toxic pollutants in the Dominguez Channel and the Greater Los Angeles and Long Beach Harbors. Accordingly, no inference should be drawn from the submission of this EWMP or from any action or implementation taken pursuant to it that the DC WMG members are obligated to implement the Toxics TMDL, including this EWMP or any of the Toxics TMDL's other obligations or plans, or that the DC WMG members have waived any rights under the Amended Consent Decree.

Table C.1: DC WMG TMDLs

DC WMG Member	Los Angeles Harbor Bacteria TMDL	Machado Lake Trash TMDL	Machado Lake Nutrient TMDL	Machado Lake Pesticides and PCBs TMDL	DC and LA Harbor Waters Toxic Pollutants TMDL
El Segundo					X
Hawthorne					X
Inglewood					X
Lomita		X	X	X	
Los Angeles	X	X	X	X	X
Los Angeles County	X	X	X	X	X
LACFCD		X	X	X	X

Los Angeles Harbor Bacteria TMDL (Inner Cabrillo Beach and Main Ship Channel)
The Los Angeles Harbor Bacteria TMDL became effective on March 10, 2004 as Resolution No. 2004-011. Reconsideration of certain technical matters pertaining to this TMDL were approved by the State Board on March 19, 2013 as Resolution No. R12-007. In response to the Time Schedule Order (TSO) discussed below, a Pollution Prevention Plan Work Plan was submitted to the Regional Board by the Port of Los Angeles and the City of Los Angeles Department of Public Works Bureau of Sanitation Watershed Protection Division. The Work Plan for the Pollution Prevention Plan is discussed in Section 3.1.3 of the EWMP.

Per Attachment N Part A.2 of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with the final Water Quality Based Effluent Limitations (WQBELs) listed in Table C.2 for discharges to the Los Angeles Harbor Main Ship Channel, Los Angeles and Long Beach Harbor, and Inner Cabrillo Beach as of December 28, 2012, the effective date of the MS4 Permit.

Table C.2: Los Angeles Harbor Bacteria TMDL WQBELs		
Constituent	Effluent Limitations (MPN or cfu)	
	Daily Maximum	Geometric Mean
Total coliform	10,000/100 mL	1,000/100 mL
Fecal coliform	400/100 mL	200/100 mL
Enterococcus	104/100 mL	35/100 mL

[1] Total coliform density shall not exceed a daily maximum of 1,000/100 mL if the ratio of fecal-to-total coliform exceeds 0.1.

Per Attachment N Part A.3.a of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with the single sample bacteria Receiving Water Limitations (RWLs) listed in Table C.3 for the Los Angeles Harbor Main Ship Channel and Inner Cabrillo Beach as of December 28, 2012, the effective date of the MS4 Permit. The RWLs in Table C.3 will only be applicable until the effective date of the revised Los Angeles Harbor Bacteria TMDL (Attachment C of Resolution No. R12-007). Upon the effective date of this revision, the Permittees must comply with the final single sample bacteria RWLs listed in Table C.4, per Attachment N Part A.3.b of the MS4 Permit. The revised Los Angeles Harbor Bacteria TMDL was approved by the State Board on March 19, 2013 and will become effective following USEPA approval.

Table C.3: Los Angeles Harbor Bacteria TMDL RWLs				
Time Period	Receiving Water	Compliance Monitoring Location	Annual Allowable Exceedance Days of the Single Sample Objective (days)	
			Daily Sampling	Weekly Sampling
Summer Dry-Weather (April 1 to October 31)	Inner Cabrillo Beach	CB1 & CB2	0	0
	Main Ship Channel	HW07	0	0
Winter Dry-Weather (November 1 to March 31)	Inner Cabrillo Beach	CB1 & CB2	0	0
	Main Ship Channel	HW07	3	1
Wet Weather[1] (Year-round)	Inner Cabrillo Beach	CB1 & CB2	0	0
	Main Ship Channel	HW07	15	3

[1] Wet weather is defined as days with 0.1-inch of rain or greater and the three days following the rain event.

Table C.4: Los Angeles Harbor Bacteria TMDL RWLs upon TMDL Revision				
Time Period	Receiving Water	Compliance Monitoring Location	Annual Allowable Exceedance Days of the Single Sample Objective (days)	
			Daily Sampling	Weekly Sampling
Summer Dry-Weather (April 1 to October 31)	Inner Cabrillo Beach	CB1 & CB2	0	0
	Main Ship Channel	HW07	0	0
Winter Dry-Weather (November 1 to March 31)	Inner Cabrillo Beach	CB1 & CB2	0	0
	Main Ship Channel	HW07	8	1
Wet Weather[1] (Year-round)	Inner Cabrillo Beach	CB1 & CB2	0	0
	Main Ship Channel	HW07	15	3

[1] Wet weather is defined as days with 0.1-inch of rain or greater and the three days following the rain event.

Per Attachment N Part A.3.c of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with the geometric mean RWLs identified in Table C.5 for the Los Angeles Harbor

Main Ship Channel, Los Angeles and Long Beach Inner Harbor, and Inner Cabrillo Beach as of December 28, 2013, the effective date of the MS4 Permit.

Table C.5: Los Angeles Harbor Bacteria TMDL Geometric Mean RWLs	
Constituent	**Geometric Mean**
Total coliform	1,000 MPN/100 mL
Fecal coliform	200 MPN/100 mL
Enterococcus	35 MPN/100 mL

On February 6, 2014, a TSO was approved for Inner Cabrillo Beach, at the boat launch ramp (Station CB1). In summary, the TSO (Order No. R4-2014-0023) states that the Permittees believe additional time is necessary to comply with the WQBELs and RWLs at Station CB1. The TSO presented monitoring data suggesting that the WQBELs and RWLs were not being met, as well as identifying the activities that have been completed with the intent of meeting the load allocations. The TSO identifies new WQBELs and RWLs, as well as an implementation schedule for additional watershed control measures such as monitoring, BMP implementation, BMP effectiveness assessments, and feasibility studies. From February 6, 2013 to December 28, 2017, the City of Los Angeles MS4 discharges to Inner Cabrillo Beach shall not exceed the WQBELs for total coliform, fecal coliform, and *enterococcus* per the allowable exceedance days presented in Table C.6 on an annual basis (November 1st - October 31st). From February 6, 2013 to December 28, 2017, the City of Los Angeles shall comply with the interim RWLs for total coliform, fecal coliform, and *enterococcus* per the allowable exceedance days presented in Table C.7 on an annual basis (November 1st - October 31st).

Table C.6: Los Angeles Harbor Bacteria TMDL WQBELs for Station CB1			
Compliance Monitoring Station	**Annual Allowable Exceedance Days (days)**		
	Single Sample Summer Dry-Weather	**Single Sample Winter Dry-Weather**	**Geometric Mean Year Round**
Station CB1	23	18	79

Table C.7: Los Angeles Harbor Bacteria TMDL RWLs for Station CB1			
Compliance Monitoring Station	**Annual Allowable Exceedance Days (days)**		
	Single Sample Summer Dry-Weather	**Single Sample Winter Dry-Weather**	**Geometric Mean Year Round**
Station CB1	23	18	79

Machado Lake Trash TMDL
The Machado Lake Trash TMDL became effective on March 6, 2008 as Resolution No. 2007-006.

Per Attachment N Part B of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with the final WQBEL of zero trash discharged to Machado Lake no later than March 6, 2016, and every year thereafter. In addition, Permittees must comply with interim and final WQBELs as illustrated in Table C.8. If Permittees opt to derive a site specific trash generation rate through its Trash Monitoring and Reporting Plan (TMRP), the baseline limitation will be calculated by multiplying the point source area(s) by the derived trash generation rate(s).

Table C.8: Machado Lake Trash TMDL WQBELs

DC WMG Member	Baseline[1]	3/6/12 (80%)	3/6/13 (60%)	3/6/14 (40%)	3/6/15 (20%)	3/6/16 (0%)
		Annual Trash Discharge (gallons/year)				
Lomita	9,393	7,514	5,636	3,757	1,879	0
Los Angeles	12,331	9,865	7,399	4,932	2,466	0
Los Angeles County	8,304	6,643	4,982	3,322	1,661	0
LACFCD	16	13	10	7	3	0

[1] The Regional Board calculated the baseline WQBELs for the Permittees based on the estimated trash generation rate of 5,334 gallons of uncompressed trash per square mile per year.

Machado Lake Nutrient TMDL

The Machado Lake Nutrient TMDL became effective on March 11, 2009 as Resolution No. 2008-006. Los Angeles County Unincorporated Areas has developed a Multipollutant TMDL implementation plan applicable to this TMDL. In addition, the LACFCD also completed a TMDL implementation plan addressing this TMDL.

Per Attachment N Part C.2 of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with the interim and final WQBELs listed in Table C.9 for discharges to Machado Lake.

Table C.9: Machado Lake Nutrient TMDL WQBELs

Deadline	Interim and Final Effluent Limitations	
	Monthly Average of Total Phosphorus (mg/L)	Monthly Average of Total Nitrogen[1] (mg/L)
As of December 12, 2013[2]	1.25	3.50
March 11, 2014	1.25	2.45
September 11, 2018	0.10	1.00

[1] $TKN+NO_3\text{-}N+NO_2\text{-}N$
[2] Effective date of the MS4 Permit

Per Attachment N Part C.3 of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, may be deemed in compliance with the WQBELs by actively participating in a Lake Water Quality Management Plan (LWQMP) and attaining RWLs. The City of Los Angeles has entered into a Memorandum of Agreement (MOA) with the Regional Board to implement the LWQMP and reduce external nutrient loading to attain the RWLs listed in Table C.10. Permittees also may be deemed in compliance with the WQBELs by demonstrating reduction of total nitrogen and total phosphorus on an annual mass basis measured at the storm drain outfall of the Permittee's drainage area where approved by the Regional Board Executive Officer based on the results of a special study. The annual mass based allocation demonstrated should be equivalent to a monthly average concentration of 0.1 mg/L total phosphorus and 1.0 mg/L total nitrogen based on approved flow conditions. The County of Los Angeles submitted a special study work plan, which was approved by the Regional Board Executive Officer, establishing the annual mass based WQBELs listed in Table C.11.

Table C.10: Machado Lake Nutrient TMDL RWLs (City of Los Angeles)		
Deadline	Interim and Final Effluent Limitations	
	Monthly Average of Total Phosphorus (mg/L)	Monthly Average of Total Nitrogen (mg/L)
As of December 12, 2013[1]	1.25	3.50
March 11, 2014	1.25	2.45
September 11, 2018	0.10	1.00

[1] Effective date of the MS4 Permit

Table C.11: Machado Lake Nutrient TMDL WQBELs (Los Angeles County)		
Deadline	Interim and Final Effluent Limitations	
	Annual Load Total Phosphorus (kg)	Annual Load Total Nitrogen KN+NO3-N+NO2-N (kg)
March 11, 2014	887	1,739
September 11, 2018	71	710

Machado Lake Pesticides and PCBs TMDL

The Machado Lake Pesticides and PCBs TMDL (also known as the Machado Lake Toxics TMDL) became effective on March 20, 2012 as Resolution No. R10-008. Los Angeles County Unincorporated Areas has developed a Multipollutant TMDL implementation plan applicable to this TMDL. In addition, the LACFCD also completed a TMDL implementation plan addressing this TMDL.

Per Attachment N Part D of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with the WQBELs listed in Table C.12 for discharges of suspended sediments to Machado Lake, applied as a three year average no later than September 19, 2019.

Table C.12: Machado Lake Pesticides and PCBs TMDL WQBELs	
Pollutant	Effluent Limitations for Suspended Sediment-Associated Contaminants (µg/kg dry weight)
Total PCBs	59.8
DDT (all congeners)	4.16
DDE (all congeners)	3.16
DDD (all congeners)	4.88
Total DDT	5.28
Chlordane	3.24
Dieldrin	1.90

DC and LA Harbor Waters Toxic Pollutants TMDL

The DC and LA Harbor Waters Toxic Pollutants TMDL (also known as the Los Angeles and Long Beach Harbor Toxic and Metals TMDL) became effective on March 23, 2012 as Resolution No. R11-008. According to the Regional Board implementation schedule, implementation plans must be developed by the responsible parties and submitted to the Regional Board by March 23, 2014. The development of an EWMP will satisfy the implementation plan requirements.

Per Attachment N Part E.2 of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with interim WQBELs for discharges to Dominguez Channel freshwater during wet-weather and concentration-based WQBELs for pollutant concentrations in the sediment discharged to the Dominguez Channel Estuary and Greater Los Angeles and Long Beach Harbor Waters by December 28, 2012, the effective date of the MS4 Permit. For discharges to Dominguez Channel freshwater during wet-weather, the freshwater toxicity interim WQBEL is 2 TUc. This interim limitation should be implemented as a trigger requiring initiation of the TRE/TIE process outlined in USEPAs "Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program" (2000). The interim metals WQBELs for the Dominguez Channel freshwater and Torrance Lateral during wet-weather are presented in Table C.13. For sediment discharges to the Dominguez Channel Estuary and Greater Los Angeles and Long Beach Harbor Waters, Permittees should comply with interim concentration-based WQBELs presented in Table C.14.

Table C.13: DC and LA Harbor Waters Toxic Pollutants TMDL Interim Freshwater Metals WQBELs for Wet-Weather

Pollutant	Interim Effluent Limitation Daily Maximum (µg/L)
Total Copper	207.51
Total Lead	122.88
Total Zinc	898.87

Table C.14: DC and LA Harbor Waters Toxic Pollutants TMDL Sediment Interim WQBELs

Water Body	Interim Effluent Limitations Daily Maximum (mg/kg sediment)					
	Copper	Lead	Zinc	DDT	PAHs	PCBs
Dominguez Channel Estuary (below Vermont Avenue)	220.0	510.0	789.0	1.727	31.60	1.490
Los Angeles Inner Harbor	154.1	145.5	362.0	0.341	90.30	2.107
Los Angeles Outer Harbor (inside breakwater)	104.1	46.7	150	0.097	4.022	0.310
Los Angeles Harbor - Cabrillo Marina	367.6	72.6	281.8	0.186	36.12	0.199
Los Angeles Harbor - Consolidated Slip	1,470.0	1,100.0	1,705.0	1.724	386.00	1.920
Los Angeles Harbor - Inner Cabrillo Beach Area	129.7	46.7	163.1	0.145	4.022	0.033
Fish Harbor	558.6	116.5	430.5	40.5	2,102.7	36.6

Per Attachment N Part E.3 of the MS4 Permit, the Permittees subject to this TMDL, as identified in Table C.1, must comply with final WQBELs for discharges to Dominguez Channel freshwater during wet-weather and concentration-based WQBELs for pollutant concentrations in the sediment discharged to the Dominguez Channel Estuary and Greater Los Angeles and Long Beach Harbor Waters by March 23, 2032 and every year thereafter. Per Attachment N Part E.3.a of the MS4 Permit, for discharges to Dominguez Channel freshwater during wet-weather, the freshwater toxicity effluent limitation should not exceed the monthly median of 1 TUc. The Permittees should also comply with the final metals WQBELs presented in Table C.15 for discharges to Dominguez Channel and all upstream reaches and tributaries of the Dominguez Channel above Vermont Avenue.

Table C.15: DC and LA Harbor Waters Toxic Pollutants TMDL Final Freshwater Metals WQBELs for Wet-Weather	
Metals	**Water Column Mass-Based Final Effluent Limitation Daily Maximum (g/day)**
Total Copper	1,300.3
Total Lead	5,733.7
Total Zinc	9,355.5

Per Attachment N Part E.3.b of the MS4 Permit, the Torrance Lateral must comply with freshwater final metals WQBELs and final concentration-based WQBELs for sediments, as shown in Table C.16 and Table C.17 respectively.

Table C.16: DC and LA Harbor Waters Toxic Pollutants TMDL Final Freshwater Metals WQBELs for Wet-Weather in Torrance Lateral	
Metals	**Water Column Effluent Limitation Daily Maximum (unfiltered, µg/L)**
Total Copper	9.7
Total Lead	42.7
Total Zinc	69.7

Table C.17: DC and LA Harbor Waters Toxic Pollutants TMDL Final Sediment Metals WQBELs for Wet-Weather in Torrance Lateral	
Metals	**Concentration-Based Effluent Limitation Daily Maximum (mg/kg dry)**
Total Copper	31.6
Total Lead	35.8
Total Zinc	121

Per Attachment N Part E.3.c of the MS4 Permit, the Dominguez Channel Estuary and Greater Los Angeles (and Long Beach) Harbor Waters must comply with final mass-based WQBELs, expressed as an annual loading of pollutants in the sediment deposited to the Dominguez Channel Estuary and the Greater Los Angeles and Long Beach Harbor Waters and final concentration-based WQBELs for sediments as shown in Table C.18. Permittees should also comply with final concentration-based WQBELs for pollutant concentrations in the sediments discharged to the Dominguez Channel Estuary, Consolidated Slip, and Fish Harbor as shown in Table C.19. Compliance with these limitations should be met by March 23, 2032 and every year thereafter.

Table C.18: DC and LA Harbor Waters Toxic Pollutants TMDL Final Sediment Metals WQBELs for DC Estuary and Los Angeles Harbor				
Water Body	**Final Effluent Limitations Annual (kg/yr)**			
	Total Cu	**Total Pb**	**Total Zn**	**Total PAHs**
Dominguez Channel Estuary	22.4	54.2	271.8	0.134
Consolidated Slip	2.73	3.63	28.7	0.0058
Inner Harbor	1.7	34.0	115.9	0.088
Outer Harbor	0.91	26.1	81.5	0.105
Fish Harbor (POLA)	0.00017	0.54	1.62	0.007
Cabrillo Marina	0.0196	0.289	0.74	0.00016

Table C.19: DC and LA Harbor Waters Toxic Pollutants TMDL Final Sediment Metals WQBELs for DC Estuary and Los Angeles Harbor			
Waterbody	**Effluent Limitations Daily Maximum (mg/kg dry sediment)**		
	Cadmium	**Chromium**	**Mercury**
Dominguez Channel Estuary	1.2	--	--
Consolidated Slip	1.2	81	0.15
Fish Harbor	--	--	0.15

Per Attachment N Part E.3.d of the MS4 Permit, Permittees must comply with final mass-based WQBELs, listed in Table C.20, expressed as an annual loading of total DDT and total PCBs in the sediment deposited to the Dominguez Channel Estuary and Greater Los Angeles (and Long Beach) Harbor Waters by March 23, 2032 and every year thereafter.

Table C.20: DC and LA Harbor Waters Toxic Pollutants TMDL Final Sediment Metals WQBELs for DC Estuary and Los Angeles Harbor		
Waterbody	**Final Effluent Limitations Annual (g/yr)**	
	Total DDTs	**Total PCBs**
Dominguez Channel Estuary	0.250	0.207
Consolidated Slip	0.009	0.004
Inner Harbor	0.051	0.059
Outer Harbor	0.005	0.020
Fish Harbor (POLA)	0.0003	0.0019
Cabrillo Marina	0.000028	0.000025
Inner Cabrillo Beach	0.0001	0.0003

Per Attachment N Part E.4, compliance with the limitations specified in Attachment N Part E.3.a-d, listed in Table C.15 to Table C.20, can be determined according to Table C.21. The table includes the MS4 Permit Section, which specifies the WQBELs associated with the DC and LA Harbor Waters Toxic Pollutants TMDL, the Table Reference for which the limitations are specified within this document and the various compliance determination methods.

Table C.21: DC and LA Harbor Waters Toxic Pollutants TMDL Compliance Determination

MS4 Permit Section[1]	Table Reference	Compliance Determination
Part E.2.b	Table C.14	i. Demonstrate that the sediment quality condition of *Unimpacted* or *Likely Unimpacted* via the interpretation and integration of multiple lines of evidence as defined in the Sediment Quality Objectives (SQO) Part 1 is met. ii. Meet the interim WQBELs in bed sediment over a three-year averaging period. iii. Meet the interim WQBELs in the discharge over a three-year averaging period.
Parts E.3.a.ii and E.3.b.i	Table C.15 and Table C.16	i. Final metals WQBELs are met. ii. California Toxics Rule (CTR) total metals criteria are met instream. iii. CTR total metals criteria are met in the discharge.
Parts E.3.c.i and E.3.c.ii	Table C.18 and Table C.19	i. Final WQBELs for pollutants in the sediment are met ii. The qualitative sediment conditions of *Unimpacted* or *Likely Unimpacted* via the interpretation and integration of multiples lines of evidence as defined in the SQO Part 1, is met, with the exception of chromium, which is not included in the SQO Part 1. iii. Sediment numeric targets are met in the bed sediments over a three-year averaging period.
Part E.3.d	Table C.20	i. Fish tissue targets are met in species resident to the specified waterbodies[2]. ii. Final WQBELs for pollutants in the sediment are met.

1 Attachment N of the MS4 Permit
2 A site-specific study to determine resident species should be submitted to the Regional Board Executive Officer for approval

Attachment D

Stakeholder Process

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On April 10, 2014, a stakeholder workshop was held at the Los Angeles Zoo from 10:00 a.m. through approximately 2:00 p.m. The Dominguez Channel Watershed Management Group participated in the workshop and had a table set up with information on the watershed. Attached is a list of the persons and their organizations that attended the event, a card the Dominguez Channel Watershed Management Group handed out inviting persons to join a webinar, and a handout provided by the RWQCB describing the watershed.

The webinar provided guidance on how to use the Dominguez Channel Watershed Management Group's OPTI system to input project ideas.

On November 20, 2014, a second workshop was held at the Los Angeles Zoo. This workshop discussed the planning progress, discussed the regional projects identified to date, and continued to solicit input from the stakeholders on regional project opportunities, planning criteria to incorporate, the additional benefits sought from the EWMP projects, and other desired outcomes from the program. The list of attendees from this event is also attached.

The third workshop was also at the Los Angeles Zoo on March 19, 2015. This workshop discussed the draft EWMP, the projects identified, the load reductions that would occur from project implementation, any additional benefits communities would see from implementation of the projects, and the schedules and costs for implementation of the EWMP. The list of attendees from this workshop is also attached.

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Attachment E

Data Sources and Data for Water Quality Analysis

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This attachment includes a table summarizing sources of water quality data and a table that includes the data collected and the results of the data analysis. The data analysis was used to identify water quality priorities within the Dominguez Channel Watershed Management Group (DC WMG) and is provided in support of Section 2.1 of the DC WMG Enhanced Watershed Management Program (EWMP). Additionally, compliance schedules for the milestones of each of the water bodies within the DC WMA are included in this attachment.

Attachment E Table of Contents

Table E.1: Data Sources for Water Quality Analysis

Source	Monitoring Program	Monitoring Frequency	Sampling Location	Constituents	Date Range
LACDPW	Dominguez Channel MS4 NPDES Mass Emission Monitoring Program	Multiple samples taken before and after storm events annually.	Dominguez Channel S28 Sampling Station at Artesia Blvd.	Conventional, bacteria, general, nutrients, metals, semi-volatile organics, chlorinated pesticides, organophosphate pesticides, herbicides, polychlorinated biphenyls	2002-2013
LACDPW	Storm Master	Samples taken during storm events 10/2004 - 3/9/2005	Dominguez Channel S28 Sampling Station at Artesia Blvd.	Bacteria, nutrients, metals, semi-volatile organics, chlorinated pesticides, organophosphate pesticides, herbicides, polychlorinated biphenyls	2004-2005
POLA Study by AMEC	Artesia Pollutograph Study	Multiple samples before and after storm events at the following dates: 5/16/2005, 5/17/2005, 8/17/2005, 8/18/2005, 2/27/2006, 2/28/2006 and 3/17/2006.	Dominguez Channel S28 Sampling Station at Artesia Blvd.	Conventional, bacteria, general, nutrients, metals, chlorinated pesticides, polychlorinated biphenyls, polycyclic aromatic hydrocarbons	2005-2006

Table E.1: Data Sources for Water Quality Analysis					
Source	**Monitoring Program**	**Monitoring Frequency**	**Sampling Location**	**Constituents**	**Date Range**
LABOS	Special Ammonia Sampling in Dominguez Channel	Samples taken weekly: 7/1/2009 - 8/13/2009	Dominguez Channel at: • El Segundo Blvd • Yukon Ave (tributary) • Western Ave • Vermont Ave • Carson Plaza Dr. (tributary) • Main St. (Torrance Lateral) Dominguez Channel Estuary at: • Wilmington Ave • Henry Ford Ave	Ammonia	2009
LABOS	Status and Trends Monitoring in Dominguez Channel	Monthly (Metals), Weekly (Bacteria)	Dominguez Channel at: • El Segundo Blvd • Yukon Ave. (tributary) • Western Ave. • Vermont Ave. • Carson Plaza Dr. (tributary) • Main St. (Torrance Lateral) Dominguez Channel Estuary at: • Wilmington Ave. • Henry Ford Ave.	Bacteria and Metals	2001-2009
LABOS	Machado Lake Nutrient TMDL Monitoring Program	Bi-monthly	Machado Lake at four locations (ML-1, ML-2, ML-3, ML-4)	General chemistry, ammonia and nutrients	2011-2012
LABOS	Machado Lake Water Quality Monitoring Program	Weekly	Machado Lake at four locations (ML-1, ML-2, ML-3, ML-4) and adjacent storm drains (Project 510, Project 77 and Wilmington Drain)	General chemistry, bacteria and nutrients	2006-2011

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Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Carson Plaza Dr.	Wet	Channel	Ag (sol)	µg/L	4/28/05	2/22/07	4	3	0.36	0.36	0.17	0.10	0.36	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Ag (tot)	µg/L	4/28/05	2/22/07	4	3	0.5	0.5	0.20	0.10	0.50						
Carson Plaza Dr.	Wet	Channel	As (sol)	µg/L	4/28/05	2/22/07	4	0	0.8	4.8	3.08	3.35	3.35	0	CTR	340	0.00	0 exceedances in 2 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	As (tot)	µg/L	4/28/05	2/22/07	4	0	0.9	31.6	10.08	3.90	3.90						
Carson Plaza Dr.	Wet	Channel	Ba (sol)	µg/L	4/28/05	2/22/07	4	0	18	69	47.98	52.45	52.45						
Carson Plaza Dr.	Wet	Channel	Ba (tot)	µg/L	4/28/05	2/22/07	4	0	49.4	325	128.85	70.50	70.50						
Carson Plaza Dr.	Wet	Channel	Be (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Carson Plaza Dr.	Wet	Channel	Be (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Carson Plaza Dr.	Wet	Channel	Cd (sol)	µg/L	4/28/05	2/22/07	4	3	0.165	0.165	0.15	0.15	0.17	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Cd (tot)	µg/L	4/28/05	2/22/07	4	2	0.165	0.3	0.19	0.16	0.23						
Carson Plaza Dr.	Wet	Channel	Co (sol)	µg/L	4/28/05	8/25/05	3	1	0.4	0.4	0.30	0.40	0.40						
Carson Plaza Dr.	Wet	Channel	Co (tot)	µg/L	4/28/05	8/25/05	3	0	0.4	24	8.40	0.80	0.80						
Carson Plaza Dr.	Wet	Channel	Cr (sol)	µg/L	4/28/05	2/22/07	4	0	0.34	3	1.09	0.50	0.50	0	CTR	16	0.00	0 exceedances in 2 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Cr (tot)	µg/L	4/28/05	2/22/07	4	0	0.6	70.2	18.18	0.95	0.95						
Carson Plaza Dr.	Wet	Channel	Cu (sol)	µg/L	4/28/05	2/22/07	4	0	9	11	10.25	10.50	10.50	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Carson Plaza Dr.	Wet	Channel	Cu (tot)	mg/L	4/28/05	2/22/07	4	0	12	74	32.50	22.00	22.00						
Carson Plaza Dr.	Wet	Channel	Hardness	µg/L	4/28/05	2/22/07	4	0	39.7	228	163.18	192.50	192.50						
Carson Plaza Dr.	Wet	Channel	Hg (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.01	0.01	0.00	0	TMDL	0.051	0.00	0 exceedances in 1 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Hg (tot)	µg/L	4/28/05	8/25/05	3	2	0.031	0.031	0.02	0.01	0.03						
Carson Plaza Dr.	Wet	Channel	Ni (sol)	µg/L	4/28/05	2/22/07	4	0	3.97	4	3.99	4.00	4.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Ni (tot)	µg/L	4/28/05	2/22/07	4	0	4.46	48	16.62	7.00	7.00						
Carson Plaza Dr.	Wet	Channel	Pb (sol)	µg/L	4/28/05	2/22/07	4	0	0.55	2	1.39	1.50	1.50	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Carson Plaza Dr.	Wet	Channel	Pb (tot)	µg/L	4/28/05	2/22/07	4	0	0.55	28	8.39	2.50	2.50						
Carson Plaza Dr.	Wet	Channel	Sb (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	1.00	1.00	0.00	0	CTR	4300	0.00	0 exceedances in 1 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Sb (tot)	µg/L	4/28/05	8/25/05	3	1	2	2	1.67	2.00	2.00						
Carson Plaza Dr.	Wet	Channel	Se (sol)	µg/L	4/28/05	2/22/07	4	0	0.4	0.6	0.50	0.50	0.50						
Carson Plaza Dr.	Wet	Channel	Se (tot)	µg/L	4/28/05	2/22/07	4	0	0.4	0.6	0.53	0.55	0.55						
Carson Plaza Dr.	Wet	Channel	Th (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00	0	CTR	6.3	0.00	0 exceedances in 1 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Th (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00						
Carson Plaza Dr.	Wet	Channel	Zn (sol)	µg/L	4/28/05	2/22/07	4	0	8	16	11.50	11.00	11.00	0	TMDL	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Carson Plaza Dr.	Wet	Channel	Zn (tot)	µg/L	4/28/05	2/22/07	4	0	23	174	63.25	28.00	28.00						
Carson Plaza Dr.	Dry	Channel	Ag (sol)	µg/L	3/31/05	5/26/09	35	14	0.03	0.66	0.12	0.04	0.04						
Carson Plaza Dr.	Dry	Channel	Ag (tot)	µg/L	3/31/05	5/26/09	35	14	0.03	0.49	0.13	0.10	0.08						
Carson Plaza Dr.	Dry	Channel	As (sol)	µg/L	3/31/05	5/26/09	37	0	0.8	4.4	2.01	2.06	2.06	0	CTR	150	0.00	0 exceedances in 5 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	As (tot)	µg/L	3/31/05	5/26/09	37	0	0.8	6.8	2.68	2.10	2.10						
Carson Plaza Dr.	Dry	Channel	Ba (sol)	µg/L	3/31/05	5/26/09	36	0	32.9	102	52.98	49.90	49.90						
Carson Plaza Dr.	Dry	Channel	Ba (tot)	µg/L	3/31/05	5/26/09	36	0	39	144	69.81	58.80	58.80						
Carson Plaza Dr.	Dry	Channel	Be (sol)	µg/L	3/31/05	2/24/06	9	9	0	0	0.20	0.20	0.00						
Carson Plaza Dr.	Dry	Channel	Be (tot)	µg/L	3/31/05	2/24/06	9	9	0	0	0.20	0.20	0.00						
Carson Plaza Dr.	Dry	Channel	Cd (sol)	µg/L	3/31/05	5/26/09	36	9	0.01	0.72	0.18	0.17	0.17	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Cd (tot)	µg/L	3/31/05	5/26/09	36	6	0.01	5.53	0.45	0.17	0.37						
Carson Plaza Dr.	Dry	Channel	Co (sol)	µg/L	3/31/05	2/24/06	9	2	0.2	1	0.40	0.40	0.40						
Carson Plaza Dr.	Dry	Channel	Co (tot)	µg/L	3/31/05	2/24/06	9	0	0.4	2.7	0.98	0.60	0.60						
Carson Plaza Dr.	Dry	Channel	Cr (sol)	µg/L	3/31/05	5/26/09	36	2	0.1	4.15	1.19	0.75	0.89	0	CTR	11	0.00	0 exceedances in 5 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Cr (tot)	µg/L	3/31/05	5/26/09	36	1	0.105	14.1	2.93	1.70	1.79						
Carson Plaza Dr.	Dry	Channel	Cu (sol)	µg/L	3/31/05	5/26/09	36	0	6	120	17.55	12.70	12.70	9	CTR	Hardness Dependent	0.06	9 exceedances in 5 Year(s)	25%
Carson Plaza Dr.	Dry	Channel	Cu (tot)	µg/L	3/31/05	5/26/09	36	0	7.7	178	30.11	18.50	18.50						
Carson Plaza Dr.	Dry	Channel	Hardness	mg/L	3/31/05	5/26/09	37	0	113	2230	532.35	199.00	199.00						
Carson Plaza Dr.	Dry	Channel	Hg (sol)	µg/L	3/31/05	2/24/06	9	9	0	0	0.01	0.01	0.00	0	TMDL	0.051	0.00	0 exceedances in 1 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Hg (tot)	µg/L	3/31/05	2/24/06	9	8	0.023	0.023	0.01	0.01	0.02						
Carson Plaza Dr.	Dry	Channel	Ni (sol)	µg/L	3/31/05	5/26/09	35	0	2	12.2	4.86	3.85	3.85	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Ni (tot)	µg/L	3/31/05	5/26/09	36	0	1.97	14.8	6.58	4.93	4.93						
Carson Plaza Dr.	Dry	Channel	Pb (sol)	µg/L	3/31/05	5/26/09	36	11	0.055	6	1.05	0.55	0.72	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Pb (tot)	µg/L	3/31/05	5/26/09	36	3	0.53	81.4	7.36	1.92	2.00						
Carson Plaza Dr.	Dry	Channel	Sb (sol)	µg/L	3/31/05	2/24/06	9	5	2	3	1.78	1.00	3.00	0	CTR	4300	0.00	0 exceedances in 1 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Sb (tot)	µg/L	3/31/05	2/24/06	9	5	2	4	1.78	1.00	2.50						
Carson Plaza Dr.	Dry	Channel	Se (sol)	µg/L	3/31/05	5/26/09	37	0	0.2	8.8	1.79	0.60	0.60						

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Carson Plaza Dr.	Dry	Channel	Se (tot)	µg/L	3/31/05	5/26/09	37	0	0.2	8.7	1.86	0.60	0.60	7	CTR	5	0.05	7 exceedances in 5 Year(s)	19%
Carson Plaza Dr.	Dry	Channel	Th (sol)	µg/L	3/31/05	2/24/06	9	5	1	2	0.83	0.50	1.00	0	CTR	6.3	0.00	0 exceedances in 1 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Th (tot)	µg/L	3/31/05	2/24/06	9	7	1	2	0.72	0.50	1.50						
Carson Plaza Dr.	Dry	Channel	Zn (sol)	µg/L	3/31/05	5/26/09	36	0	7	109	24.48	18.90	18.90	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Carson Plaza Dr.	Dry	Channel	Zn (tot)	µg/L	3/31/05	5/26/09	36	0	13	326	70.63	42.55	42.55						
El Segundo Blvd.	Wet	Channel	Ag (sol)	mg/L	7/25/02	2/22/07	11	10	0.68	0.68	0.34	0.13	0.68	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
El Segundo Blvd.	Wet	Channel	Ag (tot)	µg/L	7/25/02	2/22/07	11	9	0.2	0.61	0.34	0.13	0.41						
El Segundo Blvd.	Wet	Channel	As (sol)	µg/L	7/25/02	2/22/07	11	0	1	5.6	3.05	3.20	3.20	0	CTR	340	0.00	0 exceedances in 5 Year(s)	0%
El Segundo Blvd.	Wet	Channel	As (tot)	µg/L	7/25/02	2/22/07	11	0	1.1	15.8	4.50	3.60	3.60						
El Segundo Blvd.	Wet	Channel	Ba (sol)	µg/L	7/25/02	2/22/07	11	0	15	59	38.22	41.90	41.90						
El Segundo Blvd.	Wet	Channel	Ba (tot)	µg/L	7/25/02	2/22/07	11	0	29	171	63.71	58.00	58.00						
El Segundo Blvd.	Wet	Channel	Be (sol)	µg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
El Segundo Blvd.	Wet	Channel	Be (tot)	µg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
El Segundo Blvd.	Wet	Channel	Cd (sol)	µg/L	7/25/02	2/22/07	11	8	0.165	0.9	0.28	0.17	0.30	1	CTR	Hardness Dependent	0.02	1 exceedances in 5 Year(s)	9%
El Segundo Blvd.	Wet	Channel	Cd (tot)	µg/L	7/25/02	2/22/07	11	7	0.3	0.5	0.30	0.30	0.42						
El Segundo Blvd.	Wet	Channel	Co (sol)	µg/L	7/25/02	8/25/05	10	6	0.2	1	2.24	0.25	0.35						
El Segundo Blvd.	Wet	Channel	Co (tot)	µg/L	7/25/02	8/25/05	10	3	0.3	9.37	3.39	0.75	0.70						
El Segundo Blvd.	Wet	Channel	Cr (sol)	µg/L	7/25/02	2/22/07	11	2	0.59	3.1	1.32	1.00	1.00	0	CTR	16	0.00	0 exceedances in 5 Year(s)	0%
El Segundo Blvd.	Wet	Channel	Cr (tot)	µg/L	7/25/02	2/22/07	11	0	0.7	29.8	9.20	3.90	3.90						
El Segundo Blvd.	Wet	Channel	Cu (sol)	µg/L	7/25/02	2/22/07	11	1	7.9	39	17.59	12.00	16.50	5	TMDL	Hardness Dependent	0.10	5 exceedances in 5 Year(s)	45%
El Segundo Blvd.	Wet	Channel	Cu (tot)	µg/L	7/25/02	2/22/07	11	1	6.4	65.3	27.83	24.00	28.50						
El Segundo Blvd.	Wet	Channel	Hardness	µg/L	2/26/04	2/22/07	8	0	17	188	112.56	135.00	135.00						
El Segundo Blvd.	Wet	Channel	Hg (sol)	µg/L	7/25/02	8/25/05	10	6	0.02	0.1	0.03	0.01	0.05	2	TMDL	0.051	0.06	2 exceedances in 4 Year(s)	20%
El Segundo Blvd.	Wet	Channel	Hg (tot)	µg/L	7/25/02	8/25/05	10	6	0.04	0.1	0.03	0.01	0.07						
El Segundo Blvd.	Wet	Channel	Ni (sol)	µg/L	7/25/02	2/22/07	11	2	1.39	6	3.91	4.40	5.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
El Segundo Blvd.	Wet	Channel	Ni (tot)	µg/L	7/25/02	2/22/07	11	2	2.51	19.7	6.36	6.00	6.00						
El Segundo Blvd.	Wet	Channel	Pb (sol)	µg/L	7/25/02	2/22/07	11	6	0.55	19	5.09	2.00	2.00	2	TMDL	Hardness Dependent	0.04	2 exceedances in 5 Year(s)	18%
El Segundo Blvd.	Wet	Channel	Pb (tot)	µg/L	7/25/02	2/22/07	11	3	0.55	46	9.62	5.00	5.50						
El Segundo Blvd.	Wet	Channel	Sb (sol)	µg/L	7/25/02	8/25/05	10	3	2	5	3.29	3.50	3.00	0	CTR	4300	0.00	0 exceedances in 4 Year(s)	0%
El Segundo Blvd.	Wet	Channel	Sb (tot)	µg/L	7/25/02	8/25/05	10	3	2	5	3.10	3.00	3.00						
El Segundo Blvd.	Wet	Channel	Se (sol)	µg/L	7/25/02	2/22/07	11	3	0.2	0.9	0.33	0.30	0.40						
El Segundo Blvd.	Wet	Channel	Se (tot)	µg/L	7/25/02	2/22/07	11	0	0.2	0.9	0.43	0.40	0.40						
El Segundo Blvd.	Wet	Channel	Th (sol)	µg/L	7/25/02	8/25/05	9	6	1	4	1.54	1.00	2.00	0	CTR	6.3	0.00	0 exceedances in 4 Year(s)	0%
El Segundo Blvd.	Wet	Channel	Th (tot)	µg/L	7/25/02	8/25/05	10	8	1	1	0.99	0.55	1.00						
El Segundo Blvd.	Wet	Channel	Zn (sol)	µg/L	7/25/02	2/22/07	11	2	18.5	178	44.19	32.00	32.00	3	TMDL	Hardness Dependent	0.06	3 exceedances in 5 Year(s)	27%
El Segundo Blvd.	Wet	Channel	Zn (tot)	µg/L	7/25/02	2/22/07	11	2	20.3	310	97.68	90.00	90.00						
El Segundo Blvd.	Dry	Channel	Ag (sol)	µg/L	4/26/01	5/26/09	82	50	0.03	0.8	0.44	0.13	0.09						
El Segundo Blvd.	Dry	Channel	Ag (tot)	µg/L	4/26/01	5/26/09	82	49	0.03	2.07	0.47	0.13	0.04						
El Segundo Blvd.	Dry	Channel	As (sol)	µg/L	4/26/01	5/26/09	84	6	0.4	8.38	2.60	2.15	2.10	0	CTR	150	0.00	0 exceedances in 9 Year(s)	0%
El Segundo Blvd.	Dry	Channel	As (tot)	µg/L	4/26/01	5/26/09	84	4	0.4	35.6	3.46	2.60	2.52						
El Segundo Blvd.	Dry	Channel	Ba (sol)	µg/L	4/26/01	5/26/09	83	1	18.5	97.4	47.45	41.20	41.60						
El Segundo Blvd.	Dry	Channel	Ba (tot)	µg/L	4/26/01	5/26/09	83	1	20.8	248	59.23	51.00	51.35						
El Segundo Blvd.	Dry	Channel	Be (sol)	µg/L	4/26/01	2/24/06	46	43	0.025	0.08	0.20	0.20	0.06						
El Segundo Blvd.	Dry	Channel	Be (tot)	µg/L	4/26/01	2/24/06	47	42	0.008	6.3	0.33	0.20	0.04						
El Segundo Blvd.	Dry	Channel	Cd (sol)	µg/L	4/26/01	5/26/09	82	42	0.01	1.1	0.26	0.17	0.17	0	CTR	Hardness Dependent	0.00	0 exceedances in 9 Year(s)	0%
El Segundo Blvd.	Dry	Channel	Cd (tot)	mg/L	4/26/01	5/26/09	83	35	0.01	6.2	0.38	0.30	0.30						
El Segundo Blvd.	Dry	Channel	Co (sol)	µg/L	4/26/01	2/24/06	45	35	0.2	0.6	2.88	0.25	0.30						
El Segundo Blvd.	Dry	Channel	Co (tot)	µg/L	4/26/01	2/24/06	45	30	0.2	5.2	3.12	0.60	0.60						
El Segundo Blvd.	Dry	Channel	Cr (sol)	µg/L	4/26/01	5/26/09	83	24	0.045	18	1.73	1.00	1.10	1	CTR	11	0.00	1 exceedances in 9 Year(s)	1%
El Segundo Blvd.	Dry	Channel	Cr (tot)	µg/L	4/26/01	5/26/09	83	14	0.045	33	4.86	2.07	2.51						
El Segundo Blvd.	Dry	Channel	Cu (sol)	µg/L	4/26/01	5/26/09	83	6	4	442	19.10	13.00	13.00	35	CTR	Hardness Dependent	0.05	35 exceedances in 9 Year(s)	42%
El Segundo Blvd.	Dry	Channel	Cu (tot)	µg/L	4/26/01	5/26/09	83	6	4	795	30.05	18.00	20.00						
El Segundo Blvd.	Dry	Channel	Hardness	µg/L	1/29/04	5/26/09	56	0	84.7	302	183.04	173.00	173.00						
El Segundo Blvd.	Dry	Channel	Hg (sol)	µg/L	4/26/01	2/24/06	46	35	0.03	0.17	0.05	0.01	0.07	8	TMDL	0.051	0.04	8 exceedances in 5 Year(s)	17%
El Segundo Blvd.	Dry	Channel	Hg (tot)	µg/L	4/26/01	2/24/06	46	34	0.027	0.17	0.05	0.01	0.08						
El Segundo Blvd.	Dry	Channel	Ni (sol)	µg/L	4/26/01	5/26/09	81	18	0.9	34	4.21	4.00	4.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 9 Year(s)	0%
El Segundo Blvd.	Dry	Channel	Ni (tot)	µg/L	4/26/01	5/26/09	83	15	0.9	41.1	5.74	4.68	4.59						

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
El Segundo Blvd.	Dry	Channel	Pb (sol)	µg/L	4/26/01	5/26/09	81	34	0.055	28	2.83	1.40	1.04	8	CTR	Hardness Dependent	0.01	8 exceedances in 9 Year(s)	10%
El Segundo Blvd.	Dry	Channel	Pb (tot)	µg/L	4/26/01	5/26/09	83	24	0.055	96	6.95	4.00	4.00						
El Segundo Blvd.	Dry	Channel	Sb (sol)	µg/L	4/26/01	2/24/06	47	33	1.3	12.3	3.01	2.50	3.00	0	CTR	4300	0.00	0 exceedances in 5 Year(s)	0%
El Segundo Blvd.	Dry	Channel	Sb (tot)	µg/L	4/26/01	2/24/06	47	34	1.8	24.6	3.45	2.50	3.00						
El Segundo Blvd.	Dry	Channel	Se (sol)	µg/L	5/31/01	5/26/09	82	11	0.1	2.2	0.83	0.40	0.40						
El Segundo Blvd.	Dry	Channel	Se (tot)	µg/L	5/31/01	5/26/09	82	10	0.1	2.28	0.87	0.50	0.50	0	CTR	5	0.00	0 exceedances in 8 Year(s)	0%
El Segundo Blvd.	Dry	Channel	Th (sol)	µg/L	4/26/01	2/24/06	47	36	1	9.5	2.70	2.00	3.00	2	CTR	6.3	0.01	2 exceedances in 5 Year(s)	4%
El Segundo Blvd.	Dry	Channel	Th (tot)	µg/L	4/26/01	2/24/06	47	38	1.2	6	2.61	2.50	4.00						
El Segundo Blvd.	Dry	Channel	Va(sol)	µg/L	4/26/01	5/31/01	2	1	6.1	6.1	4.30	4.30	6.10						
El Segundo Blvd.	Dry	Channel	Va(tot)	µg/L	4/26/01	5/31/01	2	1	6.1	6.1	4.30	4.30	6.10						
El Segundo Blvd.	Dry	Channel	Zn (sol)	µg/L	4/26/01	5/26/09	82	7	2.4	120	27.71	20.00	22.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 9 Year(s)	0%
El Segundo Blvd.	Dry	Channel	Zn (tot)	µg/L	4/26/01	5/26/09	83	6	8	445	67.93	50.00	53.40						
Main St.	Wet	Channel	Ag (sol)	µg/L	4/28/05	2/22/07	4	3	0.36	0.36	0.17	0.10	0.36	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Wet	Channel	Ag (tot)	µg/L	4/28/05	2/22/07	4	3	0.48	0.48	0.20	0.10	0.48						
Main St.	Wet	Channel	As (sol)	µg/L	4/28/05	2/22/07	4	0	0.4	3.5	2.48	3.00	3.00	0	CTR	340	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Wet	Channel	As (tot)	µg/L	4/28/05	2/22/07	4	0	0.5	3.7	2.58	3.05	3.05						
Main St.	Wet	Channel	Ba (sol)	µg/L	4/28/05	2/22/07	4	0	20	82	52.70	54.40	54.40						
Main St.	Wet	Channel	Ba (tot)	µg/L	4/28/05	2/22/07	4	0	27	82	56.80	59.10	59.10						
Main St.	Wet	Channel	Be (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Main St.	Wet	Channel	Be (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Main St.	Wet	Channel	Cd (sol)	µg/L	4/28/05	2/22/07	4	1	0.165	2.1	0.68	0.23	0.30	1	CTR	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Main St.	Wet	Channel	Cd (tot)	µg/L	4/28/05	2/22/07	4	1	0.165	0.5	0.30	0.28	0.40						
Main St.	Wet	Channel	Co (sol)	µg/L	4/28/05	8/25/05	3	0	0.2	0.6	0.40	0.40	0.40						
Main St.	Wet	Channel	Co (tot)	µg/L	4/28/05	8/25/05	3	0	0.3	0.5	0.40	0.40	0.40						
Main St.	Wet	Channel	Cr (sol)	µg/L	4/28/05	2/22/07	4	0	0.4	2.6	1.01	0.52	0.52	0	CTR	16	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Wet	Channel	Cr (tot)	µg/L	4/28/05	2/22/07	4	0	0.08	3.9	1.33	0.66	0.66						
Main St.	Wet	Channel	Cu (sol)	µg/L	4/28/05	2/22/07	4	0	8	15	12.75	14.00	14.00	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Main St.	Wet	Channel	Cu (tot)	µg/L	4/28/05	2/22/07	4	0	12	36	23.75	23.50	23.50						
Main St.	Wet	Channel	Hardness	µg/L	4/28/05	2/22/07	4	0	41.7	291	181.68	197.00	197.00						
Main St.	Wet	Channel	Hg (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.01	0.01	0.00	0	TMDL	0.051	0.00	0 exceedances in 1 Year(s)	0%
Main St.	Wet	Channel	Hg (tot)	µg/L	4/28/05	8/25/05	3	2	0.022	0.022	0.01	0.01	0.02						
Main St.	Wet	Channel	Ni (sol)	µg/L	4/28/05	2/22/07	4	0	3.87	6	4.72	4.50	4.50	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Wet	Channel	Ni (tot)	mg/L	4/28/05	2/22/07	4	0	3.65	6	5.16	5.50	5.50						
Main St.	Wet	Channel	Pb (sol)	µg/L	4/28/05	2/22/07	4	0	0.55	4	2.39	2.50	2.50	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Main St.	Wet	Channel	Pb (tot)	µg/L	4/28/05	2/22/07	4	0	0.55	6	2.89	2.50	2.50						
Main St.	Wet	Channel	Sb (sol)	µg/L	4/28/05	8/25/05	3	1	2	3	2.00	2.00	2.50	0	CTR	4300	0.00	0 exceedances in 1 Year(s)	0%
Main St.	Wet	Channel	Sb (tot)	µg/L	4/28/05	8/25/05	3	2	3	3	1.67	1.00	3.00						
Main St.	Wet	Channel	Se (sol)	µg/L	4/28/05	2/22/07	4	0	0.4	0.5	0.43	0.40	0.40						
Main St.	Wet	Channel	Se (tot)	µg/L	4/28/05	2/22/07	4	0	0.4	0.6	0.45	0.40	0.40						
Main St.	Wet	Channel	Th (sol)	µg/L	4/28/05	8/25/05	3	1	1	1	0.83	1.00	1.00	0	CTR	6.3	0.00	0 exceedances in 1 Year(s)	0%
Main St.	Wet	Channel	Th (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00						
Main St.	Wet	Channel	Zn (sol)	µg/L	4/28/05	2/22/07	4	0	15	72	32.50	21.50	21.50	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Main St.	Wet	Channel	Zn (tot)	µg/L	4/28/05	2/22/07	4	0	29	101	50.25	35.50	35.50						
Main St.	Dry	Channel	Ag (sol)	µg/L	1/27/05	5/26/09	46	17	0.03	0.87	0.12	0.04	0.04						
Main St.	Dry	Channel	Ag (tot)	µg/L	1/27/05	5/26/09	46	16	0.03	4.18	0.18	0.06	0.04						
Main St.	Dry	Channel	As (sol)	µg/L	1/27/05	5/26/09	48	0	1	7.7	2.91	2.75	2.75	0	CTR	150	0.00	0 exceedances in 5 Year(s)	0%
Main St.	Dry	Channel	As (tot)	µg/L	1/27/05	5/26/09	48	0	1.1	106	5.45	3.10	3.10						
Main St.	Dry	Channel	Ba (sol)	µg/L	1/27/05	5/26/09	47	0	23	143	68.14	65.00	65.00						
Main St.	Dry	Channel	Ba (tot)	µg/L	1/27/05	5/26/09	47	0	29	4510	180.95	74.70	74.70						
Main St.	Dry	Channel	Be (sol)	µg/L	1/27/05	2/24/06	11	11	0	0	0.20	0.20	0.00						
Main St.	Dry	Channel	Be (tot)	µg/L	1/27/05	2/24/06	11	9	0.4	0.7	0.26	0.20	0.55						
Main St.	Dry	Channel	Cd (sol)	µg/L	1/27/05	5/26/09	47	9	0.01	0.8	0.22	0.17	0.17	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Main St.	Dry	Channel	Cd (tot)	µg/L	1/27/05	5/26/09	47	4	0.01	22.5	0.79	0.17	0.29						
Main St.	Dry	Channel	Co (sol)	µg/L	1/27/05	2/24/06	11	0	0.4	1.9	0.76	0.70	0.70						
Main St.	Dry	Channel	Co (tot)	µg/L	1/27/05	2/24/06	11	0	0.2	19.9	3.23	0.80	0.80						
Main St.	Dry	Channel	Cr (sol)	µg/L	1/27/05	5/26/09	47	2	0.045	5.17	1.36	1.00	1.09	0	CTR	11	0.00	0 exceedances in 5 Year(s)	0%
Main St.	Dry	Channel	Cr (tot)	µg/L	1/27/05	5/26/09	47	2	0.045	456	13.27	1.39	1.49						

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Main St.	Dry	Channel	Cu (sol)	µg/L	1/27/05	5/26/09	47	0	4.25	36	14.58	12.30	12.30	16	CTR	Hardness Dependent	0.08	16 exceedances in 5 Year(s)	34%
Main St.	Dry	Channel	Cu (tot)	µg/L	1/27/05	5/26/09	47	0	8.47	1010	43.56	16.90	16.90						
Main St.	Dry	Channel	Hardness	µg/L	1/27/05	5/26/09	48	0	65.8	446	235.20	225.00	225.00						
Main St.	Dry	Channel	Hg (sol)	µg/L	1/27/05	2/24/06	11	11	0	0	0.01	0.01	0.00	0	TMDL	0.051	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Dry	Channel	Hg (tot)	µg/L	1/27/05	2/24/06	11	10	0.106	0.106	0.02	0.01	0.11						
Main St.	Dry	Channel	Ni (sol)	µg/L	1/27/05	5/26/09	47	0	0.1	9.75	5.00	5.00	5.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Main St.	Dry	Channel	Ni (tot)	µg/L	1/27/05	5/26/09	47	0	3	367	14.54	5.23	5.23						
Main St.	Dry	Channel	Pb (sol)	µg/L	1/27/05	5/26/09	47	6	0.055	27	1.83	0.93	1.00	2	CTR	Hardness Dependent	0.01	2 exceedances in 5 Year(s)	4%
Main St.	Dry	Channel	Pb (tot)	µg/L	1/27/05	5/26/09	47	2	0.055	955	25.80	2.00	2.00						
Main St.	Dry	Channel	Sb (sol)	µg/L	1/27/05	2/24/06	11	6	2	5	2.00	1.00	3.00	0	CTR	4300	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Dry	Channel	Sb (tot)	µg/L	1/27/05	2/24/06	11	6	2	5	2.09	1.00	4.00						
Main St.	Dry	Channel	Se (sol)	µg/L	1/27/05	5/26/09	48	0	0.1	1.3	0.53	0.40	0.40						
Main St.	Dry	Channel	Se (tot)	µg/L	1/27/05	5/26/09	48	0	0.1	3.5	0.64	0.45	0.45	0	CTR	5	0.00	0 exceedances in 5 Year(s)	0%
Main St.	Dry	Channel	Th (sol)	mg/L	1/27/05	2/24/06	11	8	2	2	0.91	0.50	2.00	0	CTR	6.3	0.00	0 exceedances in 2 Year(s)	0%
Main St.	Dry	Channel	Th (tot)	µg/L	1/27/05	2/24/06	11	7	1	2	0.77	0.50	1.00						
Main St.	Dry	Channel	Zn (sol)	µg/L	1/27/05	5/26/09	47	0	4	95.8	27.99	24.00	24.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Main St.	Dry	Channel	Zn (tot)	µg/L	1/27/05	5/26/09	47	0	18.5	3500	138.40	40.00	40.00						
Vermont Ave.	Wet	Channel	Ag (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.10	0.10	0.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 1 Year(s)	0%
Vermont Ave.	Wet	Channel	Ag (tot)	µg/L	4/28/05	2/22/07	4	3	0.54	0.54	0.21	0.10	0.54						
Vermont Ave.	Wet	Channel	As (sol)	µg/L	4/28/05	2/22/07	4	0	0.4	1.7	1.23	1.40	1.40	0	CTR	340	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Wet	Channel	As (tot)	µg/L	4/28/05	2/22/07	4	0	0.5	3.5	1.85	1.70	1.70						
Vermont Ave.	Wet	Channel	Ba (sol)	µg/L	4/28/05	2/22/07	4	0	15	91.5	62.13	71.00	71.00						
Vermont Ave.	Wet	Channel	Ba (tot)	µg/L	4/28/05	2/22/07	4	0	52	95.2	75.30	77.00	77.00						
Vermont Ave.	Wet	Channel	Be (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Vermont Ave.	Wet	Channel	Be (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Vermont Ave.	Wet	Channel	Cd (sol)	µg/L	4/28/05	2/22/07	4	1	0.165	0.5	0.30	0.28	0.40	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Wet	Channel	Cd (tot)	µg/L	4/28/05	2/22/07	4	1	0.165	0.3	0.23	0.23	0.30						
Vermont Ave.	Wet	Channel	Co (sol)	µg/L	4/28/05	8/25/05	3	2	0.2	0.2	0.13	0.10	0.20						
Vermont Ave.	Wet	Channel	Co (tot)	µg/L	4/28/05	8/25/05	3	0	0.2	2.2	0.90	0.30	0.30						
Vermont Ave.	Wet	Channel	Cr (sol)	µg/L	4/28/05	2/22/07	4	0	0.6	1.4	1.05	1.09	1.09	0	CTR	16	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Wet	Channel	Cr (tot)	mg/L	4/28/05	2/22/07	4	0	0.54	6.3	2.36	1.30	1.30						
Vermont Ave.	Wet	Channel	Cu (sol)	µg/L	4/28/05	2/22/07	4	0	8	14	10.75	10.50	10.50	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Vermont Ave.	Wet	Channel	Cu (tot)	µg/L	4/28/05	2/22/07	4	0	9	30	17.50	15.50	15.50						
Vermont Ave.	Wet	Channel	Hardness	µg/L	4/28/05	2/22/07	4	0	32.7	351	235.93	280.00	280.00						
Vermont Ave.	Wet	Channel	Hg (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.01	0.01	0.00	0	TMDL	0.051	0.00	0 exceedances in 1 Year(s)	0%
Vermont Ave.	Wet	Channel	Hg (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.01	0.01	0.00						
Vermont Ave.	Wet	Channel	Ni (sol)	µg/L	4/28/05	2/22/07	4	0	2	5	3.25	3.00	3.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Wet	Channel	Ni (tot)	µg/L	4/28/05	2/22/07	4	0	3	6	4.90	5.30	5.30						
Vermont Ave.	Wet	Channel	Pb (sol)	µg/L	4/28/05	2/22/07	3	1	0.55	1	0.68	0.55	0.78	1	TMDL	Hardness Dependent	0.18	1 exceedances in 2 Year(s)	33%
Vermont Ave.	Wet	Channel	Pb (tot)	µg/L	4/28/05	2/22/07	4	0	0.55	8	2.89	1.50	1.50						
Vermont Ave.	Wet	Channel	Sb (sol)	µg/L	4/28/05	8/25/05	3	2	2	2	1.33	1.00	2.00	0	CTR	4300	0.00	0 exceedances in 1 Year(s)	0%
Vermont Ave.	Wet	Channel	Sb (tot)	µg/L	4/28/05	8/25/05	3	2	3	3	1.67	1.00	3.00						
Vermont Ave.	Wet	Channel	Se (sol)	µg/L	4/28/05	2/22/07	4	0	0.2	0.8	0.43	0.35	0.35						
Vermont Ave.	Wet	Channel	Se (tot)	µg/L	4/28/05	2/22/07	4	0	0.2	0.9	0.45	0.35	0.35						
Vermont Ave.	Wet	Channel	Th (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00	0	CTR	6.3	0.00	0 exceedances in 1 Year(s)	0%
Vermont Ave.	Wet	Channel	Th (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00						
Vermont Ave.	Wet	Channel	Zn (sol)	µg/L	4/28/05	2/22/07	4	0	15	42	26.50	24.50	24.50	0	TMDL	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Wet	Channel	Zn (tot)	µg/L	4/28/05	2/22/07	4	0	28	111	57.25	45.00	45.00						
Vermont Ave.	Dry	Channel	Ag (sol)	µg/L	1/27/05	5/26/09	46	17	0.03	0.72	0.11	0.04	0.04						
Vermont Ave.	Dry	Channel	Ag (tot)	µg/L	1/27/05	5/26/09	46	17	0.03	0.65	0.13	0.04	0.04						
Vermont Ave.	Dry	Channel	As (sol)	µg/L	1/27/05	5/26/09	48	0	0.2	8.07	1.57	1.31	1.31	0	CTR	150	0.00	0 exceedances in 5 Year(s)	0%
Vermont Ave.	Dry	Channel	As (tot)	µg/L	1/27/05	5/26/09	48	0	0.5	8.01	1.92	1.53	1.53						
Vermont Ave.	Dry	Channel	Ba (sol)	µg/L	1/27/05	5/26/09	47	0	19.8	95.5	63.88	60.50	60.50						
Vermont Ave.	Dry	Channel	Ba (tot)	µg/L	1/27/05	5/26/09	47	0	36	248	78.51	76.00	76.00						
Vermont Ave.	Dry	Channel	Be (sol)	µg/L	1/27/05	2/24/06	11	11	0	0	0.20	0.20	0.00						
Vermont Ave.	Dry	Channel	Be (tot)	µg/L	1/27/05	2/24/06	11	11	0	0	0.20	0.20	0.00						
Vermont Ave.	Dry	Channel	Cd (sol)	µg/L	1/27/05	5/26/09	47	14	0.01	1.23	0.18	0.15	0.07	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Vermont Ave.	Dry	Channel	Cd (tot)	µg/L	1/27/05	5/26/09	47	9	0.01	1.71	0.33	0.17	0.23						
Vermont Ave.	Dry	Channel	Co (sol)	µg/L	1/27/05	2/24/06	11	3	0.2	0.5	0.29	0.30	0.40						
Vermont Ave.	Dry	Channel	Co (tot)	µg/L	1/27/05	2/24/06	11	2	0.2	1.7	0.52	0.40	0.60						
Vermont Ave.	Dry	Channel	Cr (sol)	µg/L	1/27/05	5/26/09	47	3	0.045	12.1	1.50	1.01	1.09	1	CTR	11	0.00	1 exceedances in 5 Year(s)	2%
Vermont Ave.	Dry	Channel	Cr (tot)	µg/L	1/27/05	5/26/09	47	2	0.045	22.1	2.90	1.80	1.90						
Vermont Ave.	Dry	Channel	Cu (sol)	µg/L	1/27/05	5/26/09	47	0	2.98	29	13.20	13.00	13.00	7	CTR	Hardness Dependent	0.03	7 exceedances in 5 Year(s)	15%
Vermont Ave.	Dry	Channel	Cu (tot)	µg/L	1/27/05	5/26/09	47	0	4.07	90	20.38	16.10	16.10						
Vermont Ave.	Dry	Channel	Hardness	µg/L	1/27/05	5/26/09	48	0	87.1	2770	555.88	298.00	298.00						
Vermont Ave.	Dry	Channel	Hg (sol)	µg/L	1/27/05	2/24/06	11	10	0.03	0.03	0.01	0.01	0.03	0	TMDL	0.051	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Dry	Channel	Hg (tot)	mg/L	1/27/05	2/24/06	11	9	0.022	0.035	0.01	0.01	0.03						
Vermont Ave.	Dry	Channel	Ni (sol)	µg/L	1/27/05	5/26/09	47	0	0.1	8.9	4.22	4.04	4.04	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Vermont Ave.	Dry	Channel	Ni (tot)	µg/L	1/27/05	5/26/09	47	0	2	18.5	5.58	5.05	5.05						
Vermont Ave.	Dry	Channel	Pb (sol)	µg/L	1/27/05	5/26/09	47	13	0.055	11.5	0.96	0.55	0.55	1	CTR	Hardness Dependent	0.00	1 exceedances in 5 Year(s)	2%
Vermont Ave.	Dry	Channel	Pb (tot)	µg/L	1/27/05	5/26/09	47	5	0.055	25.7	3.22	1.44	1.85						
Vermont Ave.	Dry	Channel	Sb (sol)	µg/L	1/27/05	2/24/06	11	6	2	5	1.91	1.00	2.00	0	CTR	4300	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Dry	Channel	Sb (tot)	µg/L	1/27/05	2/24/06	11	8	2	4	1.64	1.00	4.00						
Vermont Ave.	Dry	Channel	Se (sol)	µg/L	1/27/05	5/26/09	48	1	0.1	1.05	0.41	0.40	0.40						
Vermont Ave.	Dry	Channel	Se (tot)	µg/L	1/27/05	5/26/09	48	0	0.1	1.1	0.44	0.40	0.40	0	CTR	5	0.00	0 exceedances in 5 Year(s)	0%
Vermont Ave.	Dry	Channel	Th (sol)	µg/L	1/27/05	2/24/06	11	6	1	5	1.36	0.50	2.00	0	CTR	6.3	0.00	0 exceedances in 2 Year(s)	0%
Vermont Ave.	Dry	Channel	Th (tot)	µg/L	1/27/05	2/24/06	11	6	1	5	1.55	0.50	2.00						
Vermont Ave.	Dry	Channel	Zn (sol)	µg/L	1/27/05	5/26/09	47	0	3.27	57	28.26	27.00	27.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Vermont Ave.	Dry	Channel	Zn (tot)	µg/L	1/27/05	5/26/09	47	0	23.5	296	67.22	48.00	48.00						
Western Ave.	Wet	Channel	Ag (sol)	µg/L	7/25/02	2/22/07	11	10	0.55	0.55	0.33	0.13	0.55	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Western Ave.	Wet	Channel	Ag (tot)	µg/L	7/25/02	2/22/07	11	10	0.93	0.93	0.36	0.13	0.93						
Western Ave.	Wet	Channel	As (sol)	mg/L	7/25/02	2/22/07	11	0	0.3	4.9	2.23	1.70	1.70	0	CTR	340	0.00	0 exceedances in 5 Year(s)	0%
Western Ave.	Wet	Channel	As (tot)	µg/L	7/25/02	2/22/07	11	0	0.3	5.3	2.57	2.20	2.20						
Western Ave.	Wet	Channel	Ba (sol)	µg/L	7/25/02	2/22/07	11	0	16	96.9	44.84	40.00	40.00						
Western Ave.	Wet	Channel	Ba (tot)	µg/L	7/25/02	2/22/07	11	0	34	104	57.67	44.90	44.90						
Western Ave.	Wet	Channel	Be (sol)	µg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
Western Ave.	Wet	Channel	Be (tot)	µg/L	7/25/02	8/25/05	10	9	1.1	1.1	0.25	0.20	1.10						
Western Ave.	Wet	Channel	Cd (sol)	µg/L	7/25/02	2/22/07	11	10	0.165	0.165	0.18	0.15	0.17	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Western Ave.	Wet	Channel	Cd (tot)	µg/L	7/25/02	2/22/07	11	5	0.165	1.8	0.40	0.30	0.35						
Western Ave.	Wet	Channel	Co (sol)	µg/L	7/25/02	8/25/05	10	7	0.2	1.1	2.24	0.16	0.50						
Western Ave.	Wet	Channel	Co (tot)	µg/L	7/25/02	8/25/05	10	3	0.3	2.2	2.68	0.82	0.73						
Western Ave.	Wet	Channel	Cr (sol)	µg/L	7/25/02	2/22/07	11	2	0.42	2	1.07	0.70	1.40	0	CTR	16	0.00	0 exceedances in 5 Year(s)	0%
Western Ave.	Wet	Channel	Cr (tot)	µg/L	7/25/02	2/22/07	11	0	0.5	28	7.33	3.60	3.60						
Western Ave.	Wet	Channel	Cu (sol)	µg/L	7/25/02	2/22/07	11	0	5.3	30	12.49	9.00	9.00	4	TMDL	Hardness Dependent	0.08	4 exceedances in 5 Year(s)	36%
Western Ave.	Wet	Channel	Cu (tot)	µg/L	7/25/02	2/22/07	11	0	6.5	39	17.82	15.00	15.00						
Western Ave.	Wet	Channel	Hardness	µg/L	2/26/04	2/22/07	8	0	36.6	369	172.09	170.50	170.50						
Western Ave.	Wet	Channel	Hg (sol)	µg/L	7/25/02	8/25/05	10	6	0.02	0.1	0.03	0.01	0.05	2	TMDL	0.051	0.06	2 exceedances in 4 Year(s)	20%
Western Ave.	Wet	Channel	Hg (tot)	µg/L	7/25/02	8/25/05	10	3	0.028	0.12	0.04	0.03	0.04						
Western Ave.	Wet	Channel	Ni (sol)	µg/L	7/25/02	2/22/07	11	2	1.7	5	2.82	2.68	3.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Western Ave.	Wet	Channel	Ni (tot)	µg/L	7/25/02	2/22/07	11	2	2.12	6	4.04	3.65	4.00						
Western Ave.	Wet	Channel	Pb (sol)	µg/L	7/25/02	2/22/07	11	6	0.55	16.5	3.85	1.50	2.00	3	TMDL	Hardness Dependent	0.06	3 exceedances in 5 Year(s)	27%
Western Ave.	Wet	Channel	Pb (tot)	µg/L	7/25/02	2/22/07	11	3	0.55	18.7	7.00	5.00	8.50						
Western Ave.	Wet	Channel	Sb (sol)	µg/L	7/25/02	8/25/05	10	5	2	3.3	2.39	2.00	2.00	0	CTR	4300	0.00	0 exceedances in 4 Year(s)	0%
Western Ave.	Wet	Channel	Sb (tot)	µg/L	7/25/02	8/25/05	10	6	2	4	2.39	2.00	2.90						
Western Ave.	Wet	Channel	Se (sol)	µg/L	7/25/02	2/22/07	11	2	0.2	0.9	0.39	0.30	0.40						
Western Ave.	Wet	Channel	Se (tot)	µg/L	7/25/02	2/22/07	11	0	0.2	0.9	0.46	0.40	0.40						
Western Ave.	Wet	Channel	Th (sol)	µg/L	7/25/02	8/25/05	10	10	0	0	0.90	0.55	0.00	0	CTR	6.3	0.00	0 exceedances in 4 Year(s)	0%
Western Ave.	Wet	Channel	Th (tot)	µg/L	7/25/02	8/25/05	10	10	0	0	0.90	0.55	0.00						
Western Ave.	Wet	Channel	Zn (sol)	mg/L	7/25/02	2/22/07	11	1	10.8	143	37.16	26.80	28.40	2	TMDL	Hardness Dependent	0.04	2 exceedances in 5 Year(s)	18%
Western Ave.	Wet	Channel	Zn (tot)	µg/L	7/25/02	2/22/07	11	1	19.4	155	67.84	59.00	66.20						
Western Ave.	Dry	Channel	Ag (sol)	µg/L	4/26/01	5/26/09	82	54	0.03	0.81	0.42	0.13	0.04						
Western Ave.	Dry	Channel	Ag (tot)	µg/L	4/26/01	5/26/09	82	52	0.03	1.78	0.48	0.13	0.04						
Western Ave.	Dry	Channel	As (sol)	µg/L	4/26/01	5/26/09	84	4	0.1	7.41	2.33	2.00	1.90	0	CTR	150	0.00	0 exceedances in 9 Year(s)	0%
Western Ave.	Dry	Channel	As (tot)	µg/L	4/26/01	5/26/09	84	5	0.4	6.6	2.68	2.30	2.20						

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Western Ave.	Dry	Channel	Ba (sol)	µg/L	4/26/01	5/26/09	83	1	17.4	101	56.78	54.90	54.95						
Western Ave.	Dry	Channel	Ba (tot)	mg/L	4/26/01	5/26/09	83	1	23.2	270	71.40	59.70	60.35						
Western Ave.	Dry	Channel	Be (sol)	µg/L	4/26/01	2/24/06	47	43	0.03	0.3	0.20	0.20	0.07						
Western Ave.	Dry	Channel	Be (tot)	µg/L	4/26/01	2/24/06	46	41	0.048	0.6	0.22	0.20	0.08						
Western Ave.	Dry	Channel	Cd (sol)	µg/L	4/26/01	5/26/09	82	46	0.01	6.54	0.31	0.17	0.17	1	CTR	Hardness Dependent	0.00	1 exceedances in 9 Year(s)	1%
Western Ave.	Dry	Channel	Cd (tot)	µg/L	4/26/01	5/26/09	83	44	0.01	7.71	0.42	0.25	0.30						
Western Ave.	Dry	Channel	Co (sol)	µg/L	4/26/01	2/24/06	45	37	0.2	0.7	2.87	0.25	0.35						
Western Ave.	Dry	Channel	Co (tot)	µg/L	4/26/01	2/24/06	45	34	0.3	5.6	3.03	0.40	0.40						
Western Ave.	Dry	Channel	Cr (sol)	µg/L	4/26/01	5/26/09	83	25	0.045	5.44	1.58	1.06	1.14	0	CTR	11	0.00	0 exceedances in 9 Year(s)	0%
Western Ave.	Dry	Channel	Cr (tot)	µg/L	4/26/01	5/26/09	83	11	0.045	36	4.87	1.60	1.90						
Western Ave.	Dry	Channel	Cu (sol)	µg/L	4/26/01	5/26/09	82	6	4.2	32	12.88	11.25	11.95	16	CTR	Hardness Dependent	0.02	16 exceedances in 9 Year(s)	20%
Western Ave.	Dry	Channel	Cu (tot)	µg/L	4/26/01	5/26/09	83	4	4.47	204	22.14	16.30	18.00						
Western Ave.	Dry	Channel	Hardness	µg/L	1/29/04	5/26/09	56	0	87.5	393	257.83	269.50	269.50						
Western Ave.	Dry	Channel	Hg (sol)	µg/L	4/26/01	2/24/06	46	35	0.026	0.23	0.05	0.01	0.09	7	TMDL	0.051	0.03	7 exceedances in 5 Year(s)	15%
Western Ave.	Dry	Channel	Hg (tot)	µg/L	4/26/01	2/24/06	46	33	0.022	0.23	0.06	0.01	0.08						
Western Ave.	Dry	Channel	Ni (sol)	µg/L	4/26/01	5/26/09	80	16	0.88	27	4.12	3.30	3.30	0	CTR	Hardness Dependent	0.00	0 exceedances in 9 Year(s)	0%
Western Ave.	Dry	Channel	Ni (tot)	µg/L	4/26/01	5/26/09	83	16	1.08	23.1	5.61	4.62	4.62						
Western Ave.	Dry	Channel	Pb (sol)	µg/L	4/26/01	5/26/09	81	36	0.055	21.6	2.32	1.09	1.00	2	CTR	Hardness Dependent	0.00	2 exceedances in 9 Year(s)	2%
Western Ave.	Dry	Channel	Pb (tot)	µg/L	4/26/01	5/26/09	83	28	0.055	70.4	5.54	2.80	2.90						
Western Ave.	Dry	Channel	Sb (sol)	µg/L	4/26/01	2/24/06	47	37	1.4	3	2.48	2.00	2.00	0	CTR	4300	0.00	0 exceedances in 5 Year(s)	0%
Western Ave.	Dry	Channel	Sb (tot)	µg/L	4/26/01	2/24/06	47	32	1.3	13.7	2.81	2.00	2.00						
Western Ave.	Dry	Channel	Se (sol)	µg/L	5/31/01	5/26/09	82	6	0.2	2.12	0.87	0.50	0.50						
Western Ave.	Dry	Channel	Se (tot)	µg/L	5/31/01	5/26/09	82	5	0.1	2.16	0.94	0.50	0.50	0	CTR	5	0.00	0 exceedances in 8 Year(s)	0%
Western Ave.	Dry	Channel	Th (sol)	µg/L	4/26/01	2/24/06	47	42	1	6.4	2.11	0.55	1.20	1	CTR	6.3	0.00	1 exceedances in 5 Year(s)	2%
Western Ave.	Dry	Channel	Th (tot)	µg/L	4/26/01	2/24/06	47	40	1	6.4	2.16	0.55	1.20						
Western Ave.	Dry	Channel	Va(sol)	µg/L	4/26/01	5/31/01	2	2	0	0	2.50	2.50	0.00						
Western Ave.	Dry	Channel	Va(tot)	µg/L	4/26/01	5/31/01	2	2	0	0	2.50	2.50	0.00						
Western Ave.	Dry	Channel	Zn (sol)	µg/L	4/26/01	5/26/09	82	4	4.2	88.4	23.74	21.80	22.45	0	CTR	Hardness Dependent	0.00	0 exceedances in 9 Year(s)	0%
Western Ave.	Dry	Channel	Zn (tot)	µg/L	4/26/01	5/26/09	83	3	11	876	67.81	37.00	38.10						
Yukon Ave.	Wet	Channel	Ag (sol)	µg/L	4/28/05	2/22/07	4	3	0.58	0.58	0.22	0.10	0.58	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Wet	Channel	Ag (tot)	µg/L	4/28/05	2/22/07	4	3	0.73	0.73	0.26	0.10	0.73						
Yukon Ave.	Wet	Channel	As (sol)	µg/L	4/28/05	2/22/07	4	0	0.05	2.8	1.41	1.40	1.40	0	CTR	340	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Wet	Channel	As (tot)	µg/L	4/28/05	2/22/07	4	0	0.1	3.6	2.10	2.35	2.35						
Yukon Ave.	Wet	Channel	Ba (sol)	µg/L	4/28/05	2/22/07	4	0	57.8	102	73.70	67.50	67.50						
Yukon Ave.	Wet	Channel	Ba (tot)	µg/L	4/28/05	2/22/07	4	0	70.6	270	139.65	109.00	109.00						
Yukon Ave.	Wet	Channel	Be (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Yukon Ave.	Wet	Channel	Be (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.20	0.20	0.00						
Yukon Ave.	Wet	Channel	Cd (sol)	µg/L	4/28/05	2/22/07	4	0	0.165	0.8	0.54	0.60	0.60	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Wet	Channel	Cd (tot)	µg/L	4/28/05	2/22/07	4	0	0.165	1.8	1.09	1.20	1.20						
Yukon Ave.	Wet	Channel	Co (sol)	µg/L	4/28/05	8/25/05	3	2	0.8	0.8	0.33	0.10	0.80						
Yukon Ave.	Wet	Channel	Co (tot)	µg/L	4/28/05	8/25/05	3	0	0.5	3.4	2.07	2.30	2.30						
Yukon Ave.	Wet	Channel	Cr (sol)	µg/L	4/28/05	2/22/07	4	0	0.105	15.6	4.60	1.35	1.35	0	CTR	16	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Wet	Channel	Cr (tot)	µg/L	4/28/05	2/22/07	4	0	0.47	33.2	10.89	4.95	4.95						
Yukon Ave.	Wet	Channel	Cu (sol)	µg/L	4/28/05	2/22/07	4	0	4	69	41.50	46.50	46.50	3	TMDL	Hardness Dependent	0.41	3 exceedances in 2 Year(s)	75%
Yukon Ave.	Wet	Channel	Cu (tot)	µg/L	4/28/05	2/22/07	4	0	6	171	106.00	123.50	123.50						
Yukon Ave.	Wet	Channel	Hardness	µg/L	4/28/05	2/22/07	4	0	52.4	298	209.85	244.50	244.50						
Yukon Ave.	Wet	Channel	Hg (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.01	0.01	0.00	0	TMDL	0.051	0.00	0 exceedances in 1 Year(s)	0%
Yukon Ave.	Wet	Channel	Hg (tot)	µg/L	4/28/05	8/25/05	3	1	0.024	0.034	0.02	0.02	0.03						
Yukon Ave.	Wet	Channel	Ni (sol)	µg/L	4/28/05	2/22/07	4	0	1.98	12	7.00	7.00	7.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Wet	Channel	Ni (tot)	mg/L	4/28/05	2/22/07	4	0	2.89	17	11.72	13.50	13.50						
Yukon Ave.	Wet	Channel	Pb (sol)	µg/L	4/28/05	2/22/07	4	2	0.55	2	0.89	0.53	1.28	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Yukon Ave.	Wet	Channel	Pb (tot)	µg/L	4/28/05	2/22/07	4	0	0.55	49	25.14	25.50	25.50						
Yukon Ave.	Wet	Channel	Sb (sol)	µg/L	4/28/05	8/25/05	3	2	9	9	3.67	1.00	9.00	0	CTR	4300	0.00	0 exceedances in 1 Year(s)	0%
Yukon Ave.	Wet	Channel	Sb (tot)	µg/L	4/28/05	8/25/05	3	2	35	35	12.33	1.00	35.00						
Yukon Ave.	Wet	Channel	Se (sol)	µg/L	4/28/05	2/22/07	4	0	0.1	0.5	0.33	0.35	0.35						
Yukon Ave.	Wet	Channel	Se (tot)	µg/L	4/28/05	2/22/07	4	0	0.1	0.6	0.38	0.40	0.40						
Yukon Ave.	Wet	Channel	Th (sol)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00	0	CTR	6.3	0.00	0 exceedances in 1 Year(s)	0%

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Yukon Ave.	Wet	Channel	Th (tot)	µg/L	4/28/05	8/25/05	3	3	0	0	0.50	0.50	0.00						
Yukon Ave.	Wet	Channel	Zn (sol)	µg/L	4/28/05	2/22/07	4	0	8	94	61.50	72.00	72.00	1	TMDL	Hardness Dependent	0.14	1 exceedances in 2 Year(s)	25%
Yukon Ave.	Wet	Channel	Zn (tot)	µg/L	4/28/05	2/22/07	4	0	15	376	221.50	247.50	247.50						
Yukon Ave.	Dry	Channel	Ag (sol)	µg/L	1/27/05	5/26/09	45	18	0.03	0.5	0.09	0.04	0.04						
Yukon Ave.	Dry	Channel	Ag (tot)	µg/L	1/27/05	5/26/09	45	18	0.03	0.66	0.11	0.04	0.04						
Yukon Ave.	Dry	Channel	As (sol)	µg/L	1/27/05	5/26/09	47	4	0.05	8.4	1.24	1.00	1.10	0	CTR	150	0.00	0 exceedances in 5 Year(s)	0%
Yukon Ave.	Dry	Channel	As (tot)	µg/L	1/27/05	5/26/09	47	3	0.05	22.2	1.90	1.20	1.30						
Yukon Ave.	Dry	Channel	Ba (sol)	µg/L	1/27/05	5/26/09	46	0	32.2	134	60.12	53.70	53.70						
Yukon Ave.	Dry	Channel	Ba (tot)	µg/L	1/27/05	5/26/09	46	0	40	719	88.52	62.35	62.35						
Yukon Ave.	Dry	Channel	Be (sol)	µg/L	1/27/05	2/24/06	11	11	0	0	0.20	0.20	0.00						
Yukon Ave.	Dry	Channel	Be (tot)	µg/L	1/27/05	2/24/06	11	11	0	0	0.20	0.20	0.00						
Yukon Ave.	Dry	Channel	Cd (sol)	µg/L	1/27/05	5/26/09	46	9	0.01	1.6	0.29	0.17	0.17	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Yukon Ave.	Dry	Channel	Cd (tot)	µg/L	1/27/05	5/26/09	46	5	0.01	16.6	0.85	0.35	0.41						
Yukon Ave.	Dry	Channel	Co (sol)	µg/L	1/27/05	2/24/06	11	5	0.2	0.4	0.18	0.20	0.20						
Yukon Ave.	Dry	Channel	Co (tot)	µg/L	1/27/05	2/24/06	11	3	0.2	11.5	1.75	0.30	0.75						
Yukon Ave.	Dry	Channel	Cr (sol)	µg/L	1/27/05	5/26/09	46	2	0.045	23.8	2.28	1.06	1.14	2	CTR	11	0.01	2 exceedances in 5 Year(s)	4%
Yukon Ave.	Dry	Channel	Cr (tot)	µg/L	1/27/05	5/26/09	46	1	0.045	118	6.61	1.83	1.86						
Yukon Ave.	Dry	Channel	Cu (sol)	µg/L	1/27/05	5/26/09	45	1	2.91	141	16.70	11.00	11.00	14	CTR	Hardness Dependent	0.07	14 exceedances in 5 Year(s)	31%
Yukon Ave.	Dry	Channel	Cu (tot)	µg/L	1/27/05	5/26/09	46	1	4.27	166	33.62	16.50	17.00						
Yukon Ave.	Dry	Channel	Hardness	µg/L	1/27/05	5/26/09	47	0	79.5	332	197.07	192.00	192.00						
Yukon Ave.	Dry	Channel	Hg (sol)	µg/L	1/27/05	2/24/06	11	9	0.026	0.026	0.01	0.01	0.03	0	TMDL	0.051	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Dry	Channel	Hg (tot)	µg/L	1/27/05	2/24/06	11	5	0.024	0.133	0.03	0.02	0.03						
Yukon Ave.	Dry	Channel	Ni (sol)	µg/L	1/27/05	5/26/09	46	1	0.17	12.1	3.61	2.92	3.00	0	CTR	Hardness Dependent	0.00	0 exceedances in 5 Year(s)	0%
Yukon Ave.	Dry	Channel	Ni (tot)	µg/L	1/27/05	5/26/09	46	1	1.01	80	7.03	4.19	4.30						
Yukon Ave.	Dry	Channel	Pb (sol)	mg/L	1/27/05	5/26/09	46	7	0.055	15.9	1.62	0.88	1.00	2	CTR	Hardness Dependent	0.01	2 exceedances in 5 Year(s)	4%
Yukon Ave.	Dry	Channel	Pb (tot)	µg/L	1/27/05	5/26/09	46	3	0.055	113	11.40	4.25	4.73						
Yukon Ave.	Dry	Channel	Sb (sol)	µg/L	1/27/05	2/24/06	11	9	3	3	1.36	1.00	3.00	0	CTR	4300	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Dry	Channel	Sb (tot)	µg/L	1/27/05	2/24/06	11	5	2	6	2.18	2.00	2.50						
Yukon Ave.	Dry	Channel	Se (sol)	µg/L	1/27/05	5/26/09	47	3	0.05	1.03	0.31	0.20	0.20						
Yukon Ave.	Dry	Channel	Se (tot)	µg/L	1/27/05	5/26/09	47	2	0.05	2.2	0.38	0.20	0.29	0	CTR	5	0.00	0 exceedances in 5 Year(s)	0%
Yukon Ave.	Dry	Channel	Th (sol)	µg/L	1/27/05	2/24/06	11	7	1	4	1.05	0.50	1.50	0	CTR	6.3	0.00	0 exceedances in 2 Year(s)	0%
Yukon Ave.	Dry	Channel	Th (tot)	µg/L	1/27/05	2/24/06	11	8	1	4	0.91	0.50	1.00						
Yukon Ave.	Dry	Channel	Zn (sol)	µg/L	1/27/05	5/26/09	46	0	5	171	48.91	31.50	31.50	1	CTR	Hardness Dependent	0.01	1 exceedances in 5 Year(s)	2%
Yukon Ave.	Dry	Channel	Zn (tot)	µg/L	1/27/05	5/26/09	46	0	12	669	121.62	72.85	72.85						
Henry Ford Ave.	Wet	Estuary	Ag (sol)	µg/L	7/25/02	2/22/07	11	10	0.03	0.03	0.28	0.13	0.03	0	CTR	1.9	0.00	0 exceedances in 5 Year(s)	0%
Henry Ford Ave.	Wet	Estuary	Ag (tot)	µg/L	7/25/02	2/22/07	11	9	0.09	2.48	0.50	0.13	1.29						
Henry Ford Ave.	Wet	Estuary	As (sol)	µg/L	7/25/02	2/22/07	11	0	1	2.9	1.79	1.80	1.80	0	CTR	150	0.00	0 exceedances in 5 Year(s)	0%
Henry Ford Ave.	Wet	Estuary	As (tot)	µg/L	7/25/02	2/22/07	11	0	1	4	2.14	2.00	2.00						
Henry Ford Ave.	Wet	Estuary	Ba (sol)	µg/L	7/25/02	2/22/07	11	0	6	22	10.12	10.00	10.00						
Henry Ford Ave.	Wet	Estuary	Ba (tot)	µg/L	7/25/02	2/22/07	11	0	6	56	15.88	11.00	11.00						
Henry Ford Ave.	Wet	Estuary	Be (sol)	mg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
Henry Ford Ave.	Wet	Estuary	Be (tot)	µg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
Henry Ford Ave.	Wet	Estuary	Cd (sol)	µg/L	7/25/02	2/22/07	11	6	0.2	1	0.41	0.40	0.69	0	CTR	Hardness Dependent*	0.00	0 exceedances in 5 Year(s)	0%
Henry Ford Ave.	Wet	Estuary	Cd (tot)	µg/L	7/25/02	2/22/07	11	4	0.165	0.8	0.41	0.31	0.31						
Henry Ford Ave.	Wet	Estuary	Co (sol)	µg/L	7/25/02	8/25/05	10	5	0.3	1.5	2.37	0.40	0.40						
Henry Ford Ave.	Wet	Estuary	Co (tot)	µg/L	7/25/02	8/25/05	10	3	0.4	2.4	2.84	1.30	1.10						
Henry Ford Ave.	Wet	Estuary	Cr (sol)	µg/L	7/25/02	2/22/07	10	5	0.1	3	0.75	0.50	0.60						
Henry Ford Ave.	Wet	Estuary	Cr (tot)	µg/L	7/25/02	2/22/07	11	2	0.39	27.6	7.31	1.50	2.60						
Henry Ford Ave.	Wet	Estuary	Cu (sol)	µg/L	7/25/02	2/22/07	10	4	2.3	17	5.52	3.15	7.50	5	TMDL	Hardness Dependent*	0.11	5 exceedances in 5 Year(s)	50%
Henry Ford Ave.	Wet	Estuary	Cu (tot)	µg/L	7/25/02	2/22/07	11	5	1	55	10.35	2.00	10.00						
Henry Ford Ave.	Wet	Estuary	Hardness	µg/L	2/26/04	2/22/07	8	0	25.9	5390	3,499.86	4,490.00	4,490.00						
Henry Ford Ave.	Wet	Estuary	Hg (sol)	µg/L	7/25/02	8/25/05	10	3	0.03	0.136	0.05	0.04	0.04						
Henry Ford Ave.	Wet	Estuary	Hg (tot)	µg/L	7/25/02	8/25/05	10	2	0.022	0.165	0.05	0.04	0.04						
Henry Ford Ave.	Wet	Estuary	Ni (sol)	µg/L	7/25/02	2/22/07	11	2	1.94	12.8	5.03	3.00	3.32	1	CTR	Hardness Dependent*	0.02	1 exceedances in 5 Year(s)	9%
Henry Ford Ave.	Wet	Estuary	Ni (tot)	µg/L	7/25/02	2/22/07	11	2	3	12.1	5.24	3.10	5.45						
Henry Ford Ave.	Wet	Estuary	Pb (sol)	µg/L	7/25/02	2/22/07	11	5	0.55	12.6	4.45	5.00	6.00	2	TMDL	Hardness Dependent*	0.04	2 exceedances in 5 Year(s)	18%
Henry Ford Ave.	Wet	Estuary	Pb (tot)	µg/L	7/25/02	2/22/07	11	3	0.55	36.4	10.81	6.00	9.50						

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Henry Ford Ave.	Wet	Estuary	Sb (sol)	µg/L	7/25/02	8/25/05	10	5	2	13	3.70	2.90	4.00						
Henry Ford Ave.	Wet	Estuary	Sb (tot)	µg/L	7/25/02	8/25/05	10	5	3	13	3.86	3.00	4.40						
Henry Ford Ave.	Wet	Estuary	Se (sol)	µg/L	7/25/02	2/22/07	11	5	0.2	2.1	0.36	0.20	0.20						
Henry Ford Ave.	Wet	Estuary	Se (tot)	µg/L	7/25/02	2/22/07	11	4	0.2	2.5	0.43	0.20	0.20	0	CTR	290	0.00	0 exceedances in 5 Year(s)	0%
Henry Ford Ave.	Wet	Estuary	Th (sol)	µg/L	7/25/02	8/25/05	9	4	0.7	16	3.24	1.40	1.40	1	CTR	6.3	0.04	1 exceedances in 4 Year(s)	11%
Henry Ford Ave.	Wet	Estuary	Th (tot)	µg/L	7/25/02	8/25/05	10	5	0.7	12	3.03	1.00	1.00						
Henry Ford Ave.	Wet	Estuary	Zn (sol)	µg/L	7/25/02	2/22/07	11	2	12	61	25.15	18.00	20.00	1	TMDL	90	0.02	1 exceedances in 5 Year(s)	9%
Henry Ford Ave.	Wet	Estuary	Zn (tot)	µg/L	7/25/02	2/22/07	11	2	24	243	54.13	28.20	31.00						
Henry Ford Ave.	Dry	Estuary	Ag (sol)	µg/L	4/26/01	5/26/09	75	52	0.03	4	0.58	0.13	0.04	3	CTR	Hardness Dependent*	0.00	3 exceedances in 9 Year(s)	4%
Henry Ford Ave.	Dry	Estuary	Ag (tot)	µg/L	4/26/01	5/26/09	75	52	0.03	10.5	0.84	0.13	0.30						
Henry Ford Ave.	Dry	Estuary	As (sol)	µg/L	4/26/01	5/26/09	78	4	0.3	3.2	1.62	1.50	1.40	0	CTR	36	0.00	0 exceedances in 9 Year(s)	0%
Henry Ford Ave.	Dry	Estuary	As (tot)	µg/L	4/26/01	5/26/09	79	4	0.3	3.4	1.75	1.60	1.60						
Henry Ford Ave.	Dry	Estuary	Ba (sol)	µg/L	4/26/01	5/26/09	76	3	2.46	41.1	13.22	10.50	12.00						
Henry Ford Ave.	Dry	Estuary	Ba (tot)	µg/L	4/26/01	5/26/09	76	2	2.69	45.6	14.26	12.60	13.00						
Henry Ford Ave.	Dry	Estuary	Be (sol)	µg/L	4/26/01	2/24/06	47	37	0.043	2.4	0.32	0.20	0.50						
Henry Ford Ave.	Dry	Estuary	Be (tot)	µg/L	4/26/01	2/24/06	47	34	0.022	2.3	0.33	0.25	0.40						
Henry Ford Ave.	Dry	Estuary	Cd (sol)	µg/L	4/26/01	5/26/09	76	34	0.01	5.6	0.47	0.33	0.33	0	CTR	Hardness Dependent*	0.00	0 exceedances in 9 Year(s)	0%
Henry Ford Ave.	Dry	Estuary	Cd (tot)	µg/L	4/26/01	5/26/09	76	34	0.01	5.8	0.56	0.29	0.29						
Henry Ford Ave.	Dry	Estuary	Co (sol)	µg/L	4/26/01	2/24/06	44	19	0.2	2.5	3.25	0.85	0.60						
Henry Ford Ave.	Dry	Estuary	Co (tot)	µg/L	4/26/01	2/24/06	45	20	0.38	12	3.52	0.90	0.70						
Henry Ford Ave.	Dry	Estuary	Cr (sol)	µg/L	4/26/01	5/26/09	76	46	0.045	42.5	2.83	0.50	1.61						
Henry Ford Ave.	Dry	Estuary	Cr (tot)	µg/L	4/26/01	5/26/09	76	27	0.045	31.3	4.47	1.16	2.40						
Henry Ford Ave.	Dry	Estuary	Cu (sol)	µg/L	4/26/01	5/26/09	73	21	1.3	75	10.74	6.00	11.50	43	TMDL	Hardness Dependent*	0.07	43 exceedances in 9 Year(s)	59%
Henry Ford Ave.	Dry	Estuary	Cu (tot)	mg/L	4/26/01	5/26/09	76	16	1.3	83	13.32	7.40	11.50						
Henry Ford Ave.	Dry	Estuary	Hardness	µg/L	4/29/04	5/26/09	49	0	986	6260	4,689.92	5,120.00	5,120.00						
Henry Ford Ave.	Dry	Estuary	Hg (sol)	µg/L	4/26/01	2/24/06	45	23	0.025	0.17	0.06	0.04	0.04	8	TMDL	0.051	0.04	8 exceedances in 5 Year(s)	18%
Henry Ford Ave.	Dry	Estuary	Hg (tot)	µg/L	4/26/01	2/24/06	46	22	0.023	0.17	0.06	0.04	0.05						
Henry Ford Ave.	Dry	Estuary	Ni (sol)	µg/L	4/26/01	5/26/09	74	15	0.1	23.3	7.20	5.45	6.43	19	CTR	Hardness Dependent*	0.03	19 exceedances in 9 Year(s)	26%
Henry Ford Ave.	Dry	Estuary	Ni (tot)	µg/L	4/26/01	5/26/09	76	14	0.1	37.3	7.77	5.75	6.90						
Henry Ford Ave.	Dry	Estuary	Pb (sol)	µg/L	4/26/01	5/26/09	75	31	0.055	42	5.82	5.00	5.75	14	TMDL	Hardness Dependent*	0.02	14 exceedances in 9 Year(s)	19%
Henry Ford Ave.	Dry	Estuary	Pb (tot)	µg/L	4/26/01	5/26/09	76	27	0.055	60.2	7.40	5.00	7.00						
Henry Ford Ave.	Dry	Estuary	Sb (sol)	µg/L	4/26/01	2/24/06	46	41	2.3	12.8	2.71	1.00	4.90	0	CTR	4300	0.00	0 exceedances in 5 Year(s)	0%
Henry Ford Ave.	Dry	Estuary	Sb (tot)	µg/L	4/26/01	2/24/06	47	37	1.1	23.2	3.40	2.00	3.65						
Henry Ford Ave.	Dry	Estuary	Se (sol)	µg/L	5/31/01	5/26/09	75	18	0.05	2.4	0.67	0.20	0.20						
Henry Ford Ave.	Dry	Estuary	Se (tot)	µg/L	5/31/01	5/26/09	77	15	0.05	2.4	0.72	0.20	0.20	0	CTR	5	0.00	0 exceedances in 8 Year(s)	0%
Henry Ford Ave.	Dry	Estuary	Th (sol)	µg/L	4/26/01	1/26/06	46	34	2	12	3.41	2.50	5.15	5	CTR	6.3	0.02	5 exceedances in 5 Year(s)	11%
Henry Ford Ave.	Dry	Estuary	Th (tot)	µg/L	4/26/01	1/26/06	46	33	0.669	12	3.39	2.50	4.00						
Henry Ford Ave.	Dry	Estuary	Va(sol)	µg/L	4/26/01	5/31/01	2	2	0	0	2.50	2.50	0.00						
Henry Ford Ave.	Dry	Estuary	Va(tot)	µg/L	4/26/01	5/31/01	2	2	0	0	2.50	2.50	0.00						
Henry Ford Ave.	Dry	Estuary	Zn (sol)	µg/L	4/26/01	5/26/09	74	13	2	78	21.19	16.05	19.00	0	TMDL	Hardness Dependent*	0.00	0 exceedances in 9 Year(s)	0%
Henry Ford Ave.	Dry	Estuary	Zn (tot)	µg/L	4/26/01	5/26/09	76	10	2	145	29.86	26.00	28.85						
Wilmington Ave.	Wet	Estuary	Ag (sol)	µg/L	7/25/02	2/22/07	11	10	0.03	0.03	0.28	0.13	0.03	0	CTR	1.9	0.00	0 exceedances in 5 Year(s)	0%
Wilmington Ave.	Wet	Estuary	Ag (tot)	µg/L	7/25/02	2/22/07	11	10	0.03	0.03	0.28	0.13	0.03						
Wilmington Ave.	Wet	Estuary	As (sol)	µg/L	7/25/02	2/22/07	11	0	1	2.7	1.76	1.80	1.80	0	CTR	150	0.00	0 exceedances in 5 Year(s)	0%
Wilmington Ave.	Wet	Estuary	As (tot)	µg/L	7/25/02	2/22/07	11	0	1	2.8	2.04	2.10	2.10						
Wilmington Ave.	Wet	Estuary	Ba (sol)	µg/L	7/25/02	8/25/05	10	0	9.1	32	20.47	20.80	20.80						
Wilmington Ave.	Wet	Estuary	Ba (tot)	µg/L	7/25/02	2/22/07	11	0	14	39	26.32	26.60	26.60						
Wilmington Ave.	Wet	Estuary	Be (sol)	µg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
Wilmington Ave.	Wet	Estuary	Be (tot)	µg/L	7/25/02	8/25/05	10	10	0	0	0.19	0.20	0.00						
Wilmington Ave.	Wet	Estuary	Cd (sol)	µg/L	7/25/02	2/22/07	11	7	0.16	1.2	0.32	0.17	0.33	0	CTR	Hardness Dependent*	0.00	0 exceedances in 5 Year(s)	0%
Wilmington Ave.	Wet	Estuary	Cd (tot)	µg/L	7/25/02	2/22/07	11	5	0.165	1	0.39	0.29	0.40						
Wilmington Ave.	Wet	Estuary	Co (sol)	µg/L	7/25/02	8/25/05	10	5	0.3	0.6	2.23	0.30	0.30						
Wilmington Ave.	Wet	Estuary	Co (tot)	µg/L	7/25/02	8/25/05	10	3	0.28	1.5	2.59	0.85	0.80						
Wilmington Ave.	Wet	Estuary	Cr (sol)	µg/L	7/25/02	2/22/07	11	5	0.3	2.4	0.78	0.50	0.80						
Wilmington Ave.	Wet	Estuary	Cr (tot)	µg/L	7/25/02	2/22/07	11	2	0.5	24.7	5.92	1.70	2.30						
Wilmington Ave.	Wet	Estuary	Cu (sol)	µg/L	7/25/02	2/22/07	11	1	3.9	78	13.86	8.70	9.35	10	TMDL	Hardness Dependent*	0.20	10 exceedances in 5 Year(s)	91%
Wilmington Ave.	Wet	Estuary	Cu (tot)	µg/L	7/25/02	2/22/07	11	1	4.1	78	16.61	11.00	11.00						

Table E.2: Dominguez Channel - Metals Data Summary

Location	Weather	Type	Constituent	Unit	Dates Sampled		Total No. of Values	No. Values with/ ND	Min.	Max.	Avg.	Median		No. of exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency (# of exceed. per year)	Exceedance/Time	%Exceed
					From	To						With ND	Without ND						
Wilmington Ave.	Wet	Estuary	Hardness	µg/L	2/26/04	2/22/07	8	0	19	4590	2,394.03	2,645.00	2,645.00						
Wilmington Ave.	Wet	Estuary	Hg (sol)	µg/L	7/25/02	8/25/05	10	3	0.03	0.07	0.03	0.03	0.04						
Wilmington Ave.	Wet	Estuary	Hg (tot)	µg/L	7/25/02	8/25/05	10	2	0.026	0.1	0.04	0.04	0.04						
Wilmington Ave.	Wet	Estuary	Ni (sol)	µg/L	7/25/02	2/22/07	11	2	1.54	9.1	4.32	3.00	3.00	1	CTR	Hardness Dependent*	0.02	1 exceedances in 5 Year(s)	9%
Wilmington Ave.	Wet	Estuary	Ni (tot)	µg/L	7/25/02	2/22/07	11	2	3	10.1	4.99	3.42	4.00						
Wilmington Ave.	Wet	Estuary	Pb (sol)	µg/L	7/25/02	2/22/07	11	6	0.55	8	3.38	4.00	5.60	0	TMDL	Hardness Dependent*	0.00	0 exceedances in 5 Year(s)	0%
Wilmington Ave.	Wet	Estuary	Pb (tot)	mg/L	7/25/02	2/22/07	11	3	0.55	11.4	5.90	6.00	7.50						
Wilmington Ave.	Wet	Estuary	Sb (sol)	µg/L	7/25/02	8/25/05	10	8	3.1	4	2.08	1.00	3.55						
Wilmington Ave.	Wet	Estuary	Sb (tot)	µg/L	7/25/02	8/25/05	10	6	1.1	5	2.48	2.05	3.50						
Wilmington Ave.	Wet	Estuary	Se (sol)	µg/L	7/25/02	2/22/07	11	5	0.2	2.3	0.45	0.20	0.45						
Wilmington Ave.	Wet	Estuary	Se (tot)	µg/L	7/25/02	2/22/07	11	2	0.2	2.5	0.53	0.30	0.40	0	CTR	290	0.00	0 exceedances in 5 Year(s)	0%
Wilmington Ave.	Wet	Estuary	Th (sol)	µg/L	7/25/02	8/25/05	10	8	2	14	2.40	0.55	8.00	1	CTR	6.3	0.03	1 exceedances in 4 Year(s)	10%
Wilmington Ave.	Wet	Estuary	Th (tot)	µg/L	7/25/02	8/25/05	10	7	1	10	2.62	0.55	9.80						
Wilmington Ave.	Wet	Estuary	Zn (sol)	µg/L	7/25/02	8/25/05	10	2	13.2	97	33.83	37.00	38.00	2	TMDL	90	0.06	2 exceedances in 4 Year(s)	20%
Wilmington Ave.	Wet	Estuary	Zn (tot)	µg/L	7/25/02	2/22/07	11	2	22.2	124	51.62	47.00	48.00						
Wilmington Ave.	Dry	Estuary	Ag (sol)	µg/L	4/26/01	5/26/09	75	55	0.03	2.94	0.49	0.13	0.04	1	CTR	Hardness Dependent*	0.00	1 exceedances in 9 Year(s)	1%
Wilmington Ave.	Dry	Estuary	Ag (tot)	µg/L	4/26/01	5/26/09	75	54	0.03	19.5	0.76	0.13	0.04						
Wilmington Ave.	Dry	Estuary	As (sol)	µg/L	4/26/01	5/26/09	79	4	0.2	3.9	1.77	1.50	1.49	0	CTR	36	0.00	0 exceedances in 9 Year(s)	0%
Wilmington Ave.	Dry	Estuary	As (tot)	µg/L	4/26/01	5/26/09	79	4	0.3	5.9	1.99	1.80	1.70						
Wilmington Ave.	Dry	Estuary	Ba (sol)	mg/L	4/26/01	5/26/09	76	1	4.8	69.7	25.52	23.00	23.00						
Wilmington Ave.	Dry	Estuary	Ba (tot)	µg/L	4/26/01	5/26/09	76	1	4.36	75.5	27.08	23.75	24.00						
Wilmington Ave.	Dry	Estuary	Be (sol)	µg/L	4/26/01	2/24/06	47	38	0.07	2.2	0.30	0.25	0.40						
Wilmington Ave.	Dry	Estuary	Be (tot)	µg/L	4/26/01	2/24/06	47	38	0.044	2.4	0.31	0.20	0.40						
Wilmington Ave.	Dry	Estuary	Cd (sol)	µg/L	4/26/01	5/26/09	76	39	0.01	3.52	0.45	0.25	0.35	0	CTR	Hardness Dependent*	0.00	0 exceedances in 9 Year(s)	0%
Wilmington Ave.	Dry	Estuary	Cd (tot)	µg/L	4/26/01	5/26/09	76	35	0.01	5.2	0.49	0.27	0.28						
Wilmington Ave.	Dry	Estuary	Co (sol)	µg/L	4/26/01	2/24/06	45	26	0.28	7.2	3.32	0.80	0.60						
Wilmington Ave.	Dry	Estuary	Co (tot)	µg/L	4/26/01	2/24/06	45	24	0.3	10.5	3.48	1.00	0.71						
Wilmington Ave.	Dry	Estuary	Cr (sol)	µg/L	4/26/01	5/26/09	76	37	0.045	43.1	2.67	0.50	0.99						
Wilmington Ave.	Dry	Estuary	Cr (tot)	µg/L	4/26/01	5/26/09	76	23	0.045	33.2	4.80	1.40	2.85						
Wilmington Ave.	Dry	Estuary	Cu (sol)	µg/L	4/26/01	5/26/09	72	22	0.5	56	10.70	6.00	11.10	44	TMDL	Hardness Dependent*	0.08	44 exceedances in 9 Year(s)	61%
Wilmington Ave.	Dry	Estuary	Cu (tot)	µg/L	4/26/01	5/26/09	75	17	0.5	69	13.99	9.89	13.00						
Wilmington Ave.	Dry	Estuary	Hardness	µg/L	4/29/04	5/26/09	49	0	65.2	5390	3,614.37	4,020.00	4,020.00						
Wilmington Ave.	Dry	Estuary	Hg (sol)	µg/L	4/26/01	2/24/06	46	26	0.0008	0.2	0.06	0.04	0.05	10	TMDL	0.051	0.04	10 exceedances in 5 Year(s)	22%
Wilmington Ave.	Dry	Estuary	Hg (tot)	µg/L	4/26/01	2/24/06	46	23	0.026	0.2	0.06	0.04	0.06						
Wilmington Ave.	Dry	Estuary	Ni (sol)	µg/L	4/26/01	5/26/09	75	16	0.1	36.7	7.20	5.00	5.87	16	CTR	Hardness Dependent*	0.03	16 exceedances in 9 Year(s)	21%
Wilmington Ave.	Dry	Estuary	Ni (tot)	µg/L	4/26/01	5/26/09	76	15	0.1	37.5	7.65	6.00	6.42						
Wilmington Ave.	Dry	Estuary	Pb (sol)	µg/L	4/26/01	5/26/09	72	28	0.055	32.2	5.70	5.00	5.50	12	TMDL	Hardness Dependent*	0.02	12 exceedances in 9 Year(s)	17%
Wilmington Ave.	Dry	Estuary	Pb (tot)	µg/L	4/26/01	5/26/09	76	27	0.055	46.5	6.38	5.00	6.00						
Wilmington Ave.	Dry	Estuary	Sb (sol)	µg/L	4/26/01	2/24/06	46	38	1.3	18	2.93	1.55	4.00	0	CTR	4300	0.00	0 exceedances in 5 Year(s)	0%
Wilmington Ave.	Dry	Estuary	Sb (tot)	µg/L	4/26/01	2/24/06	47	39	1.1	18	2.90	1.00	4.00						
Wilmington Ave.	Dry	Estuary	Se (sol)	µg/L	5/31/01	5/26/09	77	10	0.05	3.9	0.76	0.30	0.24						
Wilmington Ave.	Dry	Estuary	Se (tot)	µg/L	5/31/01	5/26/09	77	7	0.05	3.9	0.78	0.30	0.25	0	CTR	5	0.00	0 exceedances in 8 Year(s)	0%
Wilmington Ave.	Dry	Estuary	Th (sol)	µg/L	4/26/01	2/24/06	47	36	1.3	14	3.04	2.40	3.00	4	CTR	6.3	0.02	4 exceedances in 5 Year(s)	9%
Wilmington Ave.	Dry	Estuary	Th (tot)	µg/L	4/26/01	2/24/06	47	34	0.519	13	3.05	2.50	3.00						
Wilmington Ave.	Dry	Estuary	Va(sol)	µg/L	4/26/01	5/31/01	2	2	0	0	2.50	2.50	0.00						
Wilmington Ave.	Dry	Estuary	Va(tot)	µg/L	4/26/01	5/31/01	2	2	0	0	2.50	2.50	0.00						
Wilmington Ave.	Dry	Estuary	Zn (sol)	mg/L	4/26/01	5/26/09	75	10	2	143	29.74	25.40	27.00	4	TMDL	Hardness Dependent*	0.01	4 exceedances in 9 Year(s)	5%
Wilmington Ave.	Dry	Estuary	Zn (tot)	µg/L	4/26/01	5/26/09	76	9	2	179	38.80	32.00	33.00						

Notes:
Water quality data available but no screening criteria was determined.
Source:
Dominguez Channel Status and Trends (Metals, 2001-2009)

Table E.3: Dominguez Channel - At Station S-28 Data Summary

Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Dry	1,2 Benzanthracene	µg/L	10/31/06	11/25/07	6	6	0.05	-	-	0.05	-						
Dry	1,2,4-Trichlorobenzene	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-						
Dry	1,2-Dichlorobenzene	µg/L	10/31/06	06/12/13	28	28	0.39	-	-	0.50	-	0	CTR	17,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	1,3-Dichlorobenzene	µg/L	10/31/06	06/12/13	28	28	0.39	-	-	0.50	-	0	CTR	2,600.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	1,4-Dichlorobenzene	µg/L	10/31/06	06/12/13	28	28	0.39	-	-	0.50	-	0	CTR	2,600.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	2- Chlorophenol	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	400.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	2,4,5-TP-SILVEX	µg/L	10/31/06	06/12/13	28	28	1.49	-	-	0.10	-						
Dry	2,4-D	µg/L	10/31/06	06/12/13	28	27	0.74	-	0.553	0.01	0.553						
Dry	2,4-dichlorophenol	µg/L	10/31/06	06/12/13	30	30	0.68	-	-	0.50	-	0	CTR	790.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	2,6-Dinitrotoluene	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-						
Dry	2-Chloroethyl vinyl ether	µg/L	04/02/07	04/09/13	27	27	0.89	-	-	1.25	-						
Dry	2-Chloronaphthalene	µg/L	10/31/06	06/12/13	28	28	4.64	-	-	5.00	-	0	CTR	4,300.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	2-nitrophenol	µg/L	10/31/06	06/12/13	30	30	2.92	-	-	1.50	-						
Dry	3,3-Dichlorobenzidine	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-	0	CTR	0.08	0.00	0 exceedances in 7 Year(s)	0%
Dry	4,4'-DDD	µg/L	07/13/09	06/12/13	17	17	0.03	-	-	0.03	-	0	CTR	0.00084	0.00	0 exceedances in 4 Year(s)	0%
Dry	4,4'-DDE	µg/L	07/13/09	06/12/13	17	17	0.03	-	-	0.03	-	0	CTR	0.00059	0.00	0 exceedances in 4 Year(s)	0%
Dry	4,4'-DDT	µg/L	07/13/09	06/12/13	17	17	0.01	-	-	0.01	-	0	TMDL	0.00100	0.00	0 exceedances in 4 Year(s)	0%
Dry	4-Bromophenyl phenyl ether	µg/L	10/31/06	06/12/13	28	28	1.54	-	-	2.50	-						
Dry	4-Chlorophenyl phenyl ether	µg/L	10/31/06	06/12/13	28	28	1.36	-	-	2.50	-						
Dry	4-nitrophenol	µg/L	10/31/06	06/12/13	30	30	1.90	-	-	2.00	-						
Dry	Acenaphthene	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	2,700.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Acenaphthylene	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-						
Dry	Aldrin	µg/L	10/31/06	06/12/13	28	28	0.01	-	-	0.00	-	0	CTR	0.00014	0.00	0 exceedances in 7 Year(s)	0%
Dry	Alkalinity	mg/L	10/10/02	04/25/06	5		127.58	55	178	118.00	118						
Dry	alpha-BHC	µg/L	10/31/06	06/12/13	28	28	0.01	-	-	0.01	-	0	CTR	0.01	0.00	0 exceedances in 7 Year(s)	0%
Dry	alpha-chlordane	µg/L	10/31/06	06/12/13	27	27	0.04	-	-	0.05	-						
Dry	Anthracene	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	110,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Atrazine	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-						
Dry	Benzidine	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-	0	CTR	0.00054	0.00	0 exceedances in 7 Year(s)	0%
Dry	Benzo(a)pyrene	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	Benzo(k)flouranthene	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	beta-BHC	µg/L	10/31/06	06/12/13	28	28	0.01	-	-	0.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	BOD	mg/L	10/10/02	06/12/13	33	4	10.14	-	45.9	7.77	8.78						
Dry	Butyl benzyl phthalate	µg/L	10/31/06	06/12/13	28	28	2.74	-	-	5.00	-	0	CTR	5,200.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Chlordane	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.03	-	0	CTR	0.00059	0.00	0 exceedances in 7 Year(s)	0%
Dry	Chloride	mg/L	10/10/02	06/12/13	33	3	119.69	-	314	151.00	156						
Dry	Chlorpyrifos	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.03	-						
Dry	Chrysene	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	Cyanazine	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-						
Dry	Cyanide	mg/L	04/02/07	04/09/13	20	10	0.01	-	0.049	0.00	0.0095	0	Basin Plan	5.20	0.00	0 exceedances in 7 Year(s)	0%
Dry	delta-BHC	µg/L	10/31/06	06/12/13	28	28	0.01	-	-	0.00	-						
Dry	Diazinon	µg/L	10/31/06	06/12/13	28	28	0.00	-	-	0.01	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	Dieldrin	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.01	-	0	CTR	0.00014	0.00	0 exceedances in 7 Year(s)	0%
Dry	Diethyl phthalate	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	120,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Dimethyl phthalate	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	2,900,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	di-n-Butyl phthalate	µg/L	10/28/03	06/12/13	26	25	4.59	-	4.3	5.00	4.3	0	CTR	12,000.00	0.00	0 exceedances in 10 Year(s)	0%
Dry	di-n-Octyl phthalate	µg/L	10/31/06	06/12/13	25	25	4.60	-	-	5.00	-						
Dry	Dissolved Aluminum	µg/L	10/31/06	06/12/13	28	20	119.78	-	780	50.00	258						
Dry	Dissolved Antimony	µg/L	10/10/02	06/12/13	31	7	1.93	-	5.94	1.84	1.815	0	CTR	4,300.00	0.00	0 exceedances in 11 Year(s)	0%
Dry	Dissolved Arsenic	µg/L	10/10/02	06/12/13	31	11	1.67	-	3.55	1.63	1.775	0	CTR	150.00	0.00	0 exceedances in 11 Year(s)	0%
Dry	Dissolved Barium	µg/L	01/24/06	06/12/13	30	7	53.84	-	91.2	57.15	60.1						
Dry	Dissolved Cadmium	µg/L	10/31/06	06/12/13	28	21	0.21	-	0.494	0.13	0.339	0	CTR	Hardness Dependent	0.00	0 exceedances in 7 Year(s)	0%
Dry	Dissolved Chromium	µg/L	10/10/02	06/12/13	33	7	2.51	-	6.65	1.90	1.855						
Dry	Dissolved Chromium +6	µg/L	10/31/06	06/12/13	28	21	1.16	-	1.27	0.63	0.46	0	CTR	11.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Dissolved Copper	µg/L	10/10/02	06/12/13	33	7	16.45	-	64.4	12.00	11.9	7	CTR	Hardness Dependent	0.02	7 exceedances in 11 Year(s)	21%
Dry	Dissolved Iron	µg/L	10/31/06	06/12/13	28	16	211.32	-	1260	66.35	281.5						
Dry	Dissolved Lead	µg/L	04/30/03	06/12/13	30	11	2.40	-	21.8	0.65	1.18	1	TMDL	Hardness Dependent	0.00	1 exceedances in 11 Year(s)	3%
Dry	Dissolved Mercury	µg/L	10/31/06	06/12/13	28	28	0.19	-	-	0.25	-	0	Basin Plan	0.05	0.00	0 exceedances in 7 Year(s)	0%

Table E.3: Dominguez Channel - At Station S-28 Data Summary

Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Dry	Dissolved Nickel	µg/L	10/10/02	06/12/13	33	7	3.90	-	6.64	4.03	3.7	0	CTR	Hardness Dependent	0.00	0 exceedances in 11 Year(s)	0%
Dry	Dissolved Oxygen	mg/L	10/10/02	04/09/13	25		14.82	7.8	24.9	14.18	14.18	0	Basin Plan	5.00	0.00	0 exceedances in 11 Year(s)	0%
Dry	Dissolved Phosphorus	mg/L	10/10/02	06/12/13	33	5	0.21	-	0.89	0.16	0.19						
Dry	Dissolved Selenium	µg/L	10/10/02	06/12/13	32	12	1.93	-	5.98	2.00	2.155						
Dry	Dissolved Silver	µg/L	10/31/06	06/12/13	28	28	0.64	-	-	0.13	-						
Dry	Dissolved Thallium	µg/L	10/31/06	06/12/13	28	28	0.39	-	-	0.50	-						
Dry	Dissolved Zinc	µg/L	10/10/02	06/12/13	33	3	63.59	-	368	35.80	37.4	2	CTR	Hardness Dependent	0.01	2 exceedances in 11 Year(s)	6%
Dry	Endosulfan sulfate	µg/L	10/31/06	06/12/13	28	28	0.03	-	-	0.03	-	0	CTR	240.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Endrin	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.01	-	0	CTR	0.81	0.00	0 exceedances in 7 Year(s)	0%
Dry	Endrin aldehyde	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.01	-	0	CTR	0.81	0.00	0 exceedances in 7 Year(s)	0%
Dry	Fecal Coliform	MPN/100mL	10/10/02	04/09/13	27		24,415.56	20	240000	1,300.00	1300	19	Basin Plan	400.00	0.07	19 exceedances in 11 Year(s)	70%
Dry	Fecal Enterococcus	MPN/100ml	10/10/02	04/09/13	27	2	21,893.33	-	240000	500.00	500						
Dry	Fecal Streptococcus	MPN/100ml	10/10/02	04/09/13	27	1	24,537.04	-	240000	500.00	500						
Dry	Fluoranthene	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.03	-	0	CTR	370.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Fluorene	µg/L	10/31/06	06/12/13	28	28	0.05	-	-	0.05	-	0	CTR	14,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	gamma-BHC (lindane)	µg/L	10/31/06	06/12/13	28	28	0.01	-	0.0109	0.01	-	0	CTR	0.06	0.00	0 exceedances in 7 Year(s)	0%
Dry	gamma-chlordane	µg/L	10/31/06	06/12/13	27	27	0.04	-	-	0.05	-						
Dry	Glyphosate	µg/L	10/31/06	06/12/13	28	25	7.44	-	53.5	2.50	9.07						
Dry	Hardness	mg/L	10/10/02	04/25/06	26		285.38	170	430	270.00	270						
Dry	Heptachlor	µg/L	10/31/06	06/12/13	28	28	0.01	-	-	0.01	-	0	CTR	0.00021	0.00	0 exceedances in 7 Year(s)	0%
Dry	Heptachlor Epoxide	µg/L	10/31/06	06/12/13	28	28	0.01	-	-	0.01	-	0	CTR	0.00011	0.00	0 exceedances in 7 Year(s)	0%
Dry	Hexachlorobenzene	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	0.00077	0.00	0 exceedances in 7 Year(s)	0%
Dry	Hexachlorobutadiene	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	50.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Hexachloro-cyclopentadiene	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-	0	CTR	17,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Hexachloroethane	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	8.90	0.00	0 exceedances in 7 Year(s)	0%
Dry	Isophorone	µg/L	04/25/06	06/12/13	29	28	0.46	-	0.24	0.50	0.24	0	CTR	600.00	0.00	0 exceedances in 8 Year(s)	0%
Dry	Kjeldahl-N	mg/L	10/10/02	06/12/13	33		1.68	0.1	8.4	1.24	1.24						
Dry	Malathion	µg/L	10/31/06	06/12/13	28	28	0.66	-	-	0.50	-						
Dry	MBAS	mg/L	01/24/06	04/25/06	2		0.10	0.076	0.131	0.10	0.1035						
Dry	Methyl Tertiary Butyl Ether	µg/L	04/02/07	04/09/13	20	20	0.50	-	-	0.50	-						
Dry	Naphthalene	µg/L	10/31/06	06/12/13	28	28	0.09	-	-	0.10	-						
Dry	NH3-N	mg/L	10/10/02	06/12/13	31	8	0.29	-	1.48	0.21	0.27						
Dry	Nitrate	mg/L	10/10/02	04/25/06	5		5.82	2.47	13.9	3.70	3.7	0	Basin Plan	45.00	0.00	0 exceedances in 4 Year(s)	0%
Dry	Nitrate-N	mg/L	10/10/02	06/12/13	28	3	1.66	-	3.19	1.77	1.975	0	Basin Plan	10.00	0.00	0 exceedances in 11 Year(s)	0%
Dry	Nitrite-N	mg/L	10/10/02	06/12/13	31	21	0.05	-	0.457	0.02	0.064	0	Basin Plan	1.00	0.00	0 exceedances in 11 Year(s)	0%
Dry	Nitrobenzene	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	1,900.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	N-Nitroso-dimethyl amine	µg/L	10/31/06	07/20/09	13	13	2.12	-	-	2.50	-						
Dry	N-Nitroso-di-n-propyl amine	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-	0	CTR	1.40	0.00	0 exceedances in 7 Year(s)	0%
Dry	N-Nitroso-diphenyl amine	µg/L	10/31/06	07/20/09	13	13	0.42	-	-	0.50	-						
Dry	Oil and Grease	mg/L	04/02/07	04/09/13	20	18	3.28	-	28.2	2.50	14.75						
Dry	Pentachlorophenol	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	8.20	0.00	0 exceedances in 7 Year(s)	0%
Dry	pH	0.00	10/10/02	06/12/13	33		8.05	6.19	9.62	8.22	8.22	9	Basin Plan	8.50	0.03	9 exceedances in 11 Year(s)	27%
Dry	Phenanthrene	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.03	-						
Dry	Phenol	µg/L	10/31/06	06/12/13	27	27	0.49	-	-	0.50	-	0	CTR	4,600,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Prometryn	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-						
Dry	Pyrene	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.03	-	0	CTR	11,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Ratio Fecal Coliform/Total Coliform	0.00	10/10/02	04/25/06	5		0.15	0.02	0.43	0.10	0.10						
Dry	Simazine	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-						
Dry	Specific Conductance	umhos/cm	10/10/02	06/12/13	33		809.23	1.2	1670	1,025.00	1025						
Dry	Sulfate	mg/L	10/10/02	06/12/13	33	3	76.04	-	186	84.00	89.2						
Dry	Total Aluminum	µg/L	04/30/03	04/25/06	3		140.67	100	218	104.00	104						
Dry	Total Antimony	µg/L	10/10/02	04/25/06	4		0.90	0.54	1.23	0.91	0.91						
Dry	Total Arsenic	µg/L	10/10/02	04/25/06	4		2.16	1.17	3.55	1.97	1.965						
Dry	Total Barium	µg/L	10/19/05	04/25/06	4		72.10	14.2	161	56.60	56.6						
Dry	Total Chromium	µg/L	10/10/02	04/25/06	5		7.82	2.08	12.4	7.29	7.29						
Dry	Total Coliform	MPN/100ml	10/10/02	04/09/13	27		100,848.15	300	900000	16,000.00	16000						
Dry	Total Copper	µg/L	10/10/02	04/25/06	5		15.41	6.36	26.2	13.80	13.8						

Table E.3: Dominguez Channel - At Station S-28 Data Summary

Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Dry	Total Dissolved Solids	mg/L	10/10/02	06/12/13	33	3	500.35	-	1080	622.00	674						
Dry	Total Iron	µg/L	10/10/02	04/25/06	4		225.00	133	398	184.50	184.5						
Dry	Total Lead	µg/L	10/10/02	04/25/06	5		1.26	0.59	2.54	0.85	0.85						
Dry	Total Nickel	µg/L	10/10/02	04/25/06	5		10.40	2.32	26	2.87	2.87						
Dry	Total Organic Carbon	mg/L	10/10/02	06/12/13	54	3	11.25	-	47.5	10.25	11						
Dry	Total Phosphorus	mg/L	10/10/02	04/25/06	5		0.16	0.094	0.258	0.15	0.148						
Dry	Total Selenium	µg/L	10/10/02	04/25/06	4		2.00	1.29	3.09	1.80	1.8	0	CTR	5.00	0.00	0 exceedances in 4 Year(s)	0%
Dry	Total Suspended Solids	mg/L	10/10/02	06/12/13	64	9	52.19	-	252	24.00	27						
Dry	Total Zinc	µg/L	10/10/02	04/25/06	5		33.07	9.15	83	27.70	27.7						
Dry	Toxaphene	µg/L	10/31/06	06/12/13	28	28	0.33	-	-	0.25	-	0	CTR	0.00075	0.00	0 exceedances in 7 Year(s)	0%
Dry	Turbidity	NTU	10/10/02	06/12/13	33	1	4.22	-	28.3	2.41	2.505						
Dry	Volatile Suspended Solids	mg/L	10/10/02	06/12/13	33	2	24.58	-	91	14.00	17						
Dry	Bis(2-Chloroethoxy) methane	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-						
Dry	Bis(2-Chloroisopropyl) ether	µg/L	10/31/06	06/12/13	28	28	0.93	-	-	1.00	-	0	CTR	170,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	4-chloro-3-methylphenol	µg/L	10/31/06	06/12/13	30	30	0.90	-	-	0.50	-						
Dry	Bis(2-Chloroethyl) ether	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	1.40	0.00	0 exceedances in 7 Year(s)	0%
Dry	Bis(2-Ethylhexl) phthalate	µg/L	10/28/03	06/12/13	30	29	7.12	-	146	2.50	146	1	CTR	5.90	0.00	1 exceedances in 10 Year(s)	3%
Dry	4-6-Dinitro-2-methylphenol	µg/L	10/31/06	06/12/13	28	28	2.04	-	-	2.50	-						
Dry	Indeno (1,2,3-cd) pyrene	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.03	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	Chemical Oxygen Demand	mg/L	10/10/02	06/12/13	33	4	63.64	-	328	58.30	62.2						
Dry	Fluoride	mg/L	10/10/02	06/12/13	33	3	0.44	-	0.863	0.43	0.513						
Dry	Dissolved Beryllium	µg/L	10/31/06	06/12/13	28	28	0.26	-	-	0.25	-						
Dry	2-4-dinitrophenol	µg/L	10/31/06	06/12/13	30	30	1.83	-	-	1.50	-	0	CTR	14,000.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Endosulfan I (alpha)	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.01	-						
Dry	Endosulfan II (beta)	µg/L	10/31/06	06/12/13	28	28	0.02	-	-	0.01	-						
Dry	Cadmium	µg/L	05/16/05	06/12/13	65	30	0.52	-	2.16	0.16	0.255						
Dry	Chromium	µg/L	05/16/05	06/12/13	65	6	2.72	-	16.8	1.56	1.55						
Dry	Nickel	µg/L	05/16/05	06/12/13	65	13	3.87	-	23.2	3.61	3.43						
Dry	1-2-Diphenylhydrazine	µg/L	10/31/06	06/12/13	28	28	0.46	-	-	0.50	-	0	CTR	0.54	0.00	0 exceedances in 7 Year(s)	0%
Dry	2-4'-DDD	µg/L	10/31/06	07/20/09	13	13	0.02	-	-	0.03	-						
Dry	2-4'-DDE	µg/L	10/31/06	07/20/09	13	13	0.02	-	-	0.03	-						
Dry	2-4'-DDT	µg/L	10/31/06	07/20/09	13	13	0.00	-	-	0.00	-						
Dry	2-4-6-trichlophenol	µg/L	10/31/06	07/13/09	12	12	0.42	-	-	0.50	-						
Dry	2-4-Dinitrotoluene	µg/L	10/31/06	06/12/13	28	28	2.32	-	-	2.50	-						
Dry	2-4-dimethylphenol	µg/L	10/31/06	06/12/13	30	30	0.93	-	-	1.00	-						
Dry	Benzo[b]fluoranthene	µg/L	10/31/06	06/12/13	28	28	2.70	-	-	5.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	Benzo[g-h-i]perylene	µg/L	10/31/06	06/12/13	28	28	1.44	-	-	2.50	-						
Dry	Beryllium	µg/L	05/16/05	06/12/13	65	65	0.43	-	-	0.25	-						
Dry	Dibenzo(a-h)anthracene	µg/L	10/31/06	06/12/13	28	28	0.05	-	-	0.05	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Dry	Endrin ketone	µg/L	10/31/06	07/20/09	13	13	0.42	-	-	0.50	-						
Dry	Mercury	µg/L	05/16/05	06/12/13	65	51	0.12	-	0.235	0.05	0.013	1	Basin Plan	0.05	0.00	1 exceedances in 9 Year(s)	2%
Dry	Methoxychlor	µg/L	10/31/06	06/12/13	28	28	0.23	-	-	0.25	-						
Dry	Methylene Blue Active Substances (MBAS)	mg/L	10/31/06	06/12/13	28	15	0.30	-	1.4	0.18	0.23						
Dry	PCB-1016 (Aroclor 1016)	µg/L	10/31/06	06/12/13	28	28	0.17	-	-	0.25	-						
Dry	PCB-1221 (Aroclor 1221)	µg/L	10/31/06	06/12/13	31	31	0.18	-	-	0.25	-						
Dry	PCB-1232 (Aroclor 1232)	µg/L	10/31/06	06/12/13	28	28	0.17	-	-	0.25	-						
Dry	PCB-1242 (Aroclor 1242)	µg/L	10/31/06	06/12/13	28	28	0.17	-	-	0.25	-						
Dry	PCB-1248 (Aroclor 1248)	µg/L	10/31/06	06/12/13	28	28	0.17	-	-	0.25	-						
Dry	PCB-1254 (Aroclor 1254)	µg/L	10/31/06	06/12/13	28	28	0.17	-	-	0.25	-						
Dry	PCB-1260 (Aroclor 1260)	µg/L	10/31/06	06/12/13	28	28	0.17	-	-	0.25	-						
Dry	Thallium	µg/L	05/16/05	06/12/13	65	65	0.39	-	-	0.50	-						
Dry	Phenolics- Total recoverable	mg/L	04/02/07	04/09/13	20	18	0.06	-	0.17	0.05	0.15						
Dry	Total Petroleum Hydrocarbons	mg/L	04/02/07	04/09/13	20	19	2.03	-	6.02	2.50	6.02						
Dry	Phosphorus- Total (as P)	mg/L	10/31/06	06/12/13	28	3	0.35	-	1.26	0.28	0.32						
Dry	Nitrate (NO3)	mg/L	10/31/06	06/12/13	23	3	7.57	-	14.1	8.75	9.69	0	Basin Plan	45.00	0.00	0 exceedances in 7 Year(s)	0%
Dry	Ammonia	mg/l	03/17/06	06/12/13	33	9	0.37	-	1.79	0.11	0.285	5	Basin Plan	0.66	0.02	5 exceedances in 8 Year(s)	15%

Table E.3: Dominguez Channel - At Station S-28 Data Summary

Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Dry	Selenium	µg/L	05/16/05	06/12/13	65	29	1.62	-	6.62	1.62	1.735	0			0.00		
Dry	Carbofuran	µg/L	10/12/07	04/09/08	3	3	2.50	-	-	2.50	-						
Dry	1-2-Benzanthracene	µg/L	04/09/08	06/12/13	22	22	1.72	-	-	2.50	-						
Dry	2-4-6-Trichlorophenol	µg/L	07/13/09	06/12/13	19	19	4.05	-	-	5.00	-						
Dry	N-Nitrosodimethylamine	µg/L	07/13/09	06/12/13	17	17	2.50	-	-	2.50	-	0	CTR	8.10	0.00	0 exceedances in 4 Year(s)	0%
Dry	N-Nitrosodiphenylamine	µg/L	07/13/09	06/12/13	17	17	0.50	-	-	0.50	-	0	CTR	16.00	0.00	0 exceedances in 4 Year(s)	0%
Dry	Aluminum	µg/L	05/16/05	06/12/13	65	19	491.28	-	6780	19.70	15.25						
Dry	Arsenic	µg/L	05/16/05	06/12/13	65	14	1.46	-	4.31	1.54	1.56	0	CTR	150.00	0.00	0 exceedances in 9 Year(s)	0%
Dry	Barium	µg/L	10/31/06	06/12/13	28	7	77.77	-	181	78.65	82.4	0			0.00		
Dry	Silver	µg/L	05/16/05	06/12/13	65	64	0.69	-	1.3	0.13	1.3						
Dry	Copper	µg/L	05/16/05	06/12/13	65	5	21.47	-	245	12.90	9.045						
Dry	Iron	µg/L	05/16/05	06/12/13	65	5	730.17	-	9710	92.70	94.5						
Dry	Lead	µg/L	05/16/05	06/12/13	65	6	4.49	-	79.6	0.83	0.71						
Dry	Zinc	µg/L	05/16/05	06/12/13	65	3	82.24	-	1300	21.50	20.65						
Dry	Alkalinity as CaCO3	mg/L	10/31/06	06/12/13	28	2	129.81	-	264	176.45	178.5						
Dry	Hardness as CaCO3	mg/L	10/31/06	06/12/13	28		207.93	2	390	270.00	270						
Dry	Chromium +6	µg/L	10/31/06	06/12/13	28	20	1.26	-	1.27	0.71	0.465						
Dry	Alkalinity as Bicarbonate	mg/L	09/21/10	09/22/11	5	1	117.54	-	193	152.00	165.5						
Dry	E. Coli	MPN/100mL	10/10/12	04/09/13	4		8,239.85	393	21870	5,348.20	5348.2	4	Basin Plan	235.00	2.02	4 exceedances in 1 Year(s)	100%
Dry	Antimony	µg/L	05/16/05	06/12/13	65	16	1.90	-	9.53	1.36	1.36	0	CTR	4,300.00	0.00	0 exceedances in 9 Year(s)	0%
Dry	Benzioic Acid	µG/L	11/16/04	03/09/05	2	2		-	-	0.00	-						
Dry	Benzyl alcohol	µG/L	11/16/04	03/09/05	2	2		-	-	0.00	-						
Dry	Alkalinity (mg/L as CaCO3)	mg/L as CaCO3	05/16/05	03/17/06	21		194.76	110	270	180.00	180						
Dry	Baryium	µg/L	08/17/05	03/17/06	21		42.73	0.09	97.4	0.10	53.09999847						
Dry	Cobalt	µg/L	05/16/05	03/17/06	37	11	0.16	0.011	0.32	0.22	0.216						
Dry	Detectable DDTs (µg/L)	µg/L	05/16/05	03/17/06	21	20	-	-	-	-	-						
Dry	Dissolved Organic Carbon	mg/L	05/16/05	03/17/06	21		10.90	5.3	15	12.00	12						
Dry	Manganese	µg/L	05/16/05	03/17/06	37		6.25	0.356	31.3	4.00	4						
Dry	Molybdenum	µg/L	05/16/05	03/17/06	37	14	12.37	0.03	49.9	8.20	8.2						
Dry	Other Pesticides (µg/L)	µg/L	05/16/05	03/17/06	21	21	#DIV/0!	0	0	#NUM!	-						
Dry	Strontium	µg/L	08/17/05	03/17/06	21		447.23	0.06	988	0.07	551.00						
Dry	Tin	µg/L	05/16/05	03/17/06	37	25	0.07	0.016	0.230000004	0.02	0.0205						
Dry	Titanium	µg/L	05/16/05	03/17/06	37		0.54	0.05	3.150000095	0.37	0.373						
Dry	Total Aroclors	µg/L	05/16/05	03/17/06	21	21	-	-	-	-	-						
Dry	Total PAHs (ng/L)	ng/L	05/16/05	03/17/06	21		45.36	14.1	117.1999969	43.00	43						
Dry	Vanadium	µg/L	05/16/05	03/17/06	37	7	3.15	0.02	6.86	3.89	3.885						
Wet	1,2 Benzanthracene	µg/L	12/9/2006	12/18/2007	7	7	0.05	-	-	0.05	-						
Wet	1,2,4-Trichlorobenzene	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-						
Wet	1,2-Dichlorobenzene	µg/L	12/9/2006	1/24/2013	27	27	0.39	-	-	0.50	-	0	CTR	17,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	1,3-Dichlorobenzene	µg/L	12/9/2006	1/24/2013	27	27	0.39	-	-	0.50	-	0	CTR	2,600.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	1,4-Dichlorobenzene	µg/L	12/9/2006	1/24/2013	27	27	0.39	-	-	0.50	-	0	CTR	2,600.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	2- Chlorophenol	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	400.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	2,4,5-TP-SILVEX	µg/L	12/9/2006	1/24/2013	27	27	1.54	-	-	0.10	-						
Wet	2,4-D	µg/L	12/9/2006	1/24/2013	27	27	0.75	-	-	0.01	-						
Wet	2,4-dichlorophenol	µg/L	12/9/2006	1/24/2013	28	28	0.61	-	-	0.50	-	0	CTR	790.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	2,6-Dinitrotoluene	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-						
Wet	2-Chloroethyl vinyl ether	µg/L	12/9/2006	1/24/2013	36	36	1.00	-	-	1.25	-						
Wet	2-Chloronaphthalene	µg/L	12/9/2006	1/24/2013	27	27	4.44	-	-	5.00	-	0	CTR	4,300.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	2-nitrophenol	µg/L	12/9/2006	1/24/2013	28	28	3.34	-	-	5.00	-						
Wet	3,3-Dichlorobenzidine	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-						
Wet	4,4'-DDD	µg/L	11/4/2008	1/24/2013	17	17	0.03	-	-	0.03	-	0	CTR	0.00084	0.00	0 exceedances in 5 Year(s)	0%
Wet	4,4'-DDE	µg/L	11/4/2008	1/24/2013	17	17	0.03	-	-	0.03	-	0	CTR	0.00059	0.00	0 exceedances in 5 Year(s)	0%

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Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Wet	4,4'-DDT	µg/L	11/4/2008	1/24/2013	17	17	0.00	-	-	0.01	-	0	TMDL	1.10	0.00	0 exceedances in 5 Year(s)	0%
Wet	4-Bromophenyl phenyl ether	µg/L	12/9/2006	1/24/2013	27	27	1.63	-	-	2.50	-						
Wet	4-Chlorophenyl phenyl ether	µg/L	12/9/2006	1/24/2013	27	27	1.50	-	-	2.50	-						
Wet	4-nitrophenol	µg/L	12/9/2006	1/24/2013	28	28	1.91	-	-	2.50	-						
Wet	Acenaphthene	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	2,700.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Acenaphthylene	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-						
Wet	Aldrin	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.00	-	0	CTR	0.00014	0.00	0 exceedances in 7 Year(s)	0%
Wet	Alkalinity	mg/L	11/8/2002	2/27/2006	12		49.77	11	113.3	32.45	32.45						
Wet	alpha-BHC	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.01	-	0	CTR	0.01	0.00	0 exceedances in 7 Year(s)	0%
Wet	alpha-chlordane	µg/L	12/9/2006	1/24/2013	27	27	0.04	-	-	0.05	-						
Wet	Anthracene	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	110,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Atrazine	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-						
Wet	Benzidine	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-	0	CTR	0.00054	0.00	0 exceedances in 7 Year(s)	0%
Wet	Benzo(a)pyrene	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Benzo(k)flouranthene	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	beta-BHC	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	BOD	mg/L	11/8/2002	1/24/2013	40		19.20	3.39	146	12.65	12.65						
Wet	Butyl benzyl phthalate	µg/L	12/9/2006	1/24/2013	27	27	2.96	-	3.66	5.00	-	0	CTR	5,200.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Chlordane	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.03	-	0	CTR	0.00059	0.00	0 exceedances in 7 Year(s)	0%
Wet	Chloride	mg/L	11/8/2002	1/24/2013	39		27.45	2.58	96.7	15.80	15.8						
Wet	Chlorpyrifos	µg/L	10/17/2005	1/24/2013	28	27	0.05	-	0.91	0.03	0.91						
Wet	Chrysene	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Cyanazine	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-						
Wet	Cyanide	mg/L	12/25/2003	1/24/2013	34	15	0.02	-	0.338	0.01	0.009	0	Basin Plan	22.00	0.00	0 exceedances in 10 Year(s)	0%
Wet	delta-BHC	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.00	-						
Wet	Diazinon	µg/L	2/11/2003	1/24/2013	31	27	0.05	-	0.96	0.01	0.271	3	CTR	0.08	0.01	3 exceedances in 10 Year(s)	10%
Wet	Dieldrin	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.01	-	0	CTR	0.00014	0.00	0 exceedances in 7 Year(s)	0%
Wet	Diethyl phthalate	µg/L	1/1/2004	1/24/2013	28	27	0.90	-	1.2	1.00	1.2	0	CTR	120,000.00	0.00	0 exceedances in 10 Year(s)	0%
Wet	Dimethyl phthalate	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	2,900,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	di-n-Butyl phthalate	µg/L	12/9/2006	1/24/2013	23	23	4.35	-	-	5.00	-	0	CTR	12,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	di-n-Octyl phthalate	µg/L	12/9/2006	1/24/2013	23	23	4.35	-	-	5.00	-						
Wet	Dissolved Aluminum	µg/L	10/17/2005	1/24/2013	28	13	387.71	-	1790	133.00	516.5						
Wet	Dissolved Antimony	µg/L	11/8/2002	1/24/2013	38	3	2.81	-	7.33	2.55	2.33	0	CTR	4,300.00	0.00	0 exceedances in 11 Year(s)	0%
Wet	Dissolved Arsenic	µg/L	11/8/2002	1/24/2013	36	2	1.81	-	3.03	1.64	1.67	0	CTR	340.00	0.00	0 exceedances in 11 Year(s)	0%
Wet	Dissolved Barium	µg/L	10/18/2005	1/24/2013	31	3	42.72	-	177	27.70	26.15						
Wet	Dissolved Cadmium	µg/L	12/16/2002	1/24/2013	28	19	0.37	-	2.59	0.13	0.522	0	CTR	Hardness Dependent	0.00	0 exceedances in 11 Year(s)	0%
Wet	Dissolved Chromium	µg/L	11/8/2002	1/24/2013	39	3	2.66	-	8.16	2.11	2.04						
Wet	Dissolved Chromium +6	µg/L	12/9/2006	1/24/2013	27	20	1.20	-	0.88	0.71	0.46	0	CTR	11.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Dissolved Copper	µg/L	11/8/2002	1/24/2013	39	1	32.60	-	163	18.80	18.75	21	TMDL	Hardness Dependent	0.05	21 exceedances in 11 Year(s)	54%
Wet	Dissolved Iron	µg/L	11/8/2002	1/24/2013	34	5	590.94	-	3220	206.00	435						
Wet	Dissolved Lead	µg/L	11/8/2002	1/24/2013	34	1	8.69	-	59	2.40	2.4	5	TMDL	Hardness Dependent	0.01	5 exceedances in 11 Year(s)	15%
Wet	Dissolved Mercury	µg/L	12/9/2006	1/24/2013	27	27	0.18	-	-	0.25	-	0	Basin Plan	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Dissolved Nickel	µg/L	11/8/2002	1/24/2013	39	3	5.82	-	27	4.49	3.9	0	CTR	Hardness Dependent	0.00	0 exceedances in 11 Year(s)	0%
Wet	Dissolved Oxygen	mg/L	11/8/2002	1/24/2013	42	1	9.73	-	13.47	9.86	9.92	1	Basin Plan	5.00	0.00	1 exceedances in 11 Year(s)	2%
Wet	Dissolved Phosphorus	mg/L	11/8/2002	1/24/2013	38	1	0.27	-	0.742	0.21	0.21						
Wet	Dissolved Selenium	µg/L	11/8/2002	1/24/2013	30	24	0.82	-	1.66	0.50	1.33						
Wet	Dissolved Silver	µg/L	12/9/2006	1/24/2013	27	27	0.65	-	-	0.13	-	0	CTR	Hardness Dependent	0.00	0 exceedances in 7 Year(s)	0%
Wet	Dissolved Thallium	µg/L	12/9/2006	1/24/2013	27	27	0.37	-	-	0.50	-						
Wet	Dissolved Zinc	µg/L	11/8/2002	1/24/2013	39		213.56	19	1510	107.00	107	18	TMDL	Hardness Dependent	0.05	18 exceedances in 11 Year(s)	46%
Wet	Endosulfan sulfate	µg/L	12/9/2006	1/24/2013	27	27	0.03	-	-	0.03	-	0	CTR	240.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Endrin	µg/L	12/9/2006	1/24/2013	27	27	0	-	-	0.01	-	0	CTR	0.81	0.00	0 exceedances in 7 Year(s)	0%
Wet	Endrin aldehyde	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.01	-	0	CTR	0.81	0.00	0 exceedances in 7 Year(s)	0%
Wet	Fecal Coliform	MPN/100mL	11/8/2002	1/24/2013	46		194,961.09	110	1700000	32,500.00	32500	44	Basin Plan	400.00	0.09	44 exceedances in 11 Year(s)	96%
Wet	Fecal Enterococcus	MPN/100ml	11/8/2002	1/24/2013	46		196,259.35	130	900000	90,000.00	90000						
Wet	Fecal Streptococcus	MPN/100ml	11/8/2002	1/24/2013	46		217,172.39	130	900000	160,000.0	160000						
Wet	Fluoranthene	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.03	-	0	CTR	370.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Fluorene	µg/L	12/9/2006	1/24/2013	27	27	0.04	-	-	0.05	-	0	CTR	14,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	gamma-BHC (lindane)	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.01	-	0	CTR	0.06	0.00	0 exceedances in 7 Year(s)	0%

Table E.3: Dominguez Channel - At Station S-28 Data Summary

Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Wet	gamma-chlordane	µg/L	12/9/2006	1/24/2013	27	27	0.04	-	-	0.05	-						
Wet	Glyphosate	µg/L	12/9/2006	1/24/2013	27	20	7.86	-	17.5	8.80	12.3						
Wet	Hardness	mg/L	11/8/2002	2/28/2006	22	5	103.17	15.2	300	70.00	70						
Wet	Heptachlor	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.01	-	0	CTR	0.00021	0.00	0 exceedances in 7 Year(s)	0%
Wet	Heptachlor Epoxide	µg/L	12/9/2006	1/24/2013	27	27	0.01	-	-	0.01	-	0	CTR	0.00011	0.00	0 exceedances in 7 Year(s)	0%
Wet	Hexachlorobenzene	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	0.00077	0.00	0 exceedances in 7 Year(s)	0%
Wet	Hexachlorobutadiene	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	50.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Hexachloro-cyclopentadiene	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-	0	CTR	17,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Hexachloroethane	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	8.90	0.00	0 exceedances in 7 Year(s)	0%
Wet	Isophorone	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	600.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Kjeldahl-N	mg/L	11/8/2002	1/24/2013	39		3.22	0.193	16.2	1.72	1.72						
Wet	Malathion	µg/L	12/9/2006	1/24/2013	26	26	0.60	-	-	0.50	-						
Wet	MBAS	mg/L	11/8/2002	2/27/2006	9		0.22	0.071	0.5998	0.18	0.184						
Wet	Methyl Tertiary Butyl Ether (MTBE)	µg/L	11/1/2006	1/24/2013	30	29	0.50	-	-	0.50	-						
Wet	Naphthalene	µg/L	12/9/2006	1/24/2013	27	27	0.09	-	-	0.10	-						
Wet	NH3-N	mg/L	11/8/2002	1/24/2013	35	2	0.79	-	3.26	0.42	0.55						
Wet	Nitrate	mg/L	12/16/2002	2/27/2006	11		4.50	2.28	9.69	4.02	4.02	0	Basin Plan	45.00	0.00	0 exceedances in 4 Year(s)	0%
Wet	Nitrate-N	mg/L	12/16/2002	1/24/2013	32		1.06	0.504	3.35	0.84	0.8365	0	Basin Plan	10.00	0.00	0 exceedances in 11 Year(s)	0%
Wet	Nitrite-N	mg/L	2/11/2003	1/24/2013	33	22	0.06	-	0.514	0.02	0.085	0	Basin Plan	1.00	0.00	0 exceedances in 10 Year(s)	0%
Wet	Nitrobenzene	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	1,900.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	N-Nitroso-dimethyl amine	µg/L	12/9/2006	2/13/2009	11	11	1.82	-	-	2.50	-						
Wet	N-Nitroso-di-n-propyl amine	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-	0	CTR	1.40	0.00	0 exceedances in 7 Year(s)	0%
Wet	N-Nitroso-diphenyl amine	µg/L	12/9/2006	2/13/2009	11	11	0.36	-	-	0.50	-						
Wet	Oil and Grease	mg/L	11/8/2002	1/24/2013	38	20	2.37	-	5.8	2.28	1.95						
Wet	Pentachlorophenol	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	8.20	0.00	0 exceedances in 7 Year(s)	0%
Wet	pH	0.00	11/8/2002	1/24/2013	39		7.10	5.99	8.26	6.96	6.96	5	Basin Plan	8.50	0.01	5 exceedances in 11 Year(s)	13%
Wet	Phenanthrene	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.03	-						
Wet	Phenol	µg/L	12/9/2006	1/24/2013	27	27	0.48	-	-	0.50	-	0	CTR	4,600,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Prometryn	µg/L	12/9/2006	1/24/2013	27	27	1	-	-	1.00	-						
Wet	Pyrene	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.03	-	0	CTR	11,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Ratio Fecal Coliform/Total Coliform	0.00	11/8/2002	2/27/2006	12		0.80	0.34	1.02	0.99	0.986225 49						
Wet	Simazine	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-						
Wet	Specific Conductance	umhos/cm	11/8/2002	1/24/2013	39		237.88	47.6	735	162.00	162						
Wet	Sulfate	mg/L	11/8/2002	1/24/2013	39		19.80	2.89	50.8	12.80	12.8						
Wet	Total Aluminum	µg/L	11/8/2002	2/27/2006	9		769.22	134	2270	560.00	560						
Wet	Total Antimony	µg/L	11/8/2002	2/27/2006	11		2.84	1.11	7.42	1.75	1.75						
Wet	Total Arsenic	µg/L	11/8/2002	2/27/2006	11		5.29	1.04	34.7	1.80	1.8						
Wet	Total Barium	µg/L	1/14/2006	2/27/2006	2		26.55	17.8	35.3	26.55	26.55						
Wet	Total Cadmium	µg/L	11/8/2002	10/17/200 5	4		0.84	0.37	1.55	0.73	0.725						
Wet	Total Chromium	µg/L	11/8/2002	2/27/2006	12		6.15	1.56	12.3	5.28	5.275						
Wet	Total Coliform	MPN/100ml	11/8/2002	1/24/2013	46		559,293.48	500	3000000	240,000.0 0	240000						
Wet	Total Copper	µg/L	11/8/2002	2/27/2006	12		30.90	6.33	115	22.70	22.7						
Wet	Total Dissolved Solids	mg/L	11/8/2002	1/24/2013	39		152.82	28	446	106.00	106						
Wet	Total Iron	µg/L	11/8/2002	2/27/2006	11		975.18	191	3780	438.00	438						
Wet	Total Lead	µg/L	11/8/2002	2/27/2006	12		8.24	0.82	39.2	2.78	2.775						
Wet	Total Mercury	µg/L	1/1/2004	1/1/2004	1		0.21	0.209	0.209	0.21	0.209						
Wet	Total Nickel	µg/L	11/8/2002	2/27/2006	12		8.17	3.48	18.9	5.53	5.525						
Wet	Total Organic Carbon	mg/L	11/8/2002	1/24/2013	49		17.83	3.72	70.6	9.90	9.9						
Wet	Total Phosphorus	mg/L	11/8/2002	2/27/2006	11		0.34	0.12	0.874	0.29	0.29						
Wet	Total Selenium	µg/L	11/8/2002	1/14/2006	4		8.32	1.31	28.1	1.94	1.94						
Wet	Total Suspended Solids	mg/L	11/8/2002	5/6/2013	83	2	175.44	11	1123	123.00	123						
Wet	Total Zinc	µg/L	11/8/2002	2/27/2006	12		160.96	55	667	114.00	114						
Wet	Toxaphene	µg/L	12/9/2006	1/24/2013	27	27	0.30	-	-	0.25	-	0	CTR	0.00075	0.00	0 exceedances in 7 Year(s)	0%

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Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Wet	TPH	mg/L	12/16/2002	10/17/2005	7		1.90	1.1	3.3	2.00	2						
Wet	Turbidity	NTU	11/8/2002	1/24/2013	40		16.82	1.01	75.7	11.85	11.85						
Wet	Volatile Suspended Solids	mg/L	11/8/2002	1/24/2013	40		71.04	1.3	257	55.50	55.5						
Wet	Bis(2-Chloroethoxy) methane	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-						
Wet	Bis(2-Chloroisopropyl) ether	µg/L	12/9/2006	1/24/2013	27	27	0.89	-	-	1.00	-	0	CTR	170,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	4-chloro-3-methylphenol	µg/L	12/9/2006	1/24/2013	28	28	0.77	-	-	0.50	-						
Wet	Bis(2-Chloroethyl) ether	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	1.40	0.00	0 exceedances in 7 Year(s)	0%
Wet	Bis(2-Ethylhexl) phthalate	µg/L	10/31/2003	1/24/2013	31	28	3.34	-	19.7	2.50	15	3	CTR	5.90	0.01	3 exceedances in 10 Year(s)	10%
Wet	4-6-Dinitro-2-methylphenol	µg/L	1/1/2004	1/24/2013	28	27	2.00	-	4.1	2.50	4.1						
Wet	Indeno (1,2,3-cd) pyrene	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.03	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Chemical Oxygen Demand	mg/L	11/8/2002	1/24/2013	38	1	61.75	16.9	241	43.14	43.4						
Wet	Fluoride	mg/L	11/8/2002	1/24/2013	35	2	0.25	-	0.904	0.22	0.223						
Wet	Total Silver	µg/L	10/17/2005	10/17/2005	1		0.25	0.25	0.25	0.25	0.25						
Wet	Dissolved Beryllium	µg/L	12/9/2006	1/24/2013	27	27	0.24	-	0.154	0.25	-						
Wet	2-4-dinitrophenol	µg/L	12/9/2006	1/24/2013	28	28	1.91	-	-	2.50	-	0	CTR	14,000.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Endosulfan I (alpha)	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.01	-						
Wet	Endosulfan II (beta)	µg/L	12/9/2006	1/24/2013	27	27	0.02	-	-	0.01	-						
Wet	Cadmium	µg/L	2/27/2006	1/24/2013	37	10	0.96	-	6.4	0.50	0.51						
Wet	Chromium	µg/L	2/27/2006	1/24/2013	37		8.74	0.96	43.3	6.26	6.26						
Wet	Nickel	µg/L	2/27/2006	1/24/2013	37	1	10.40	-	47.8	7.03	7.05						
Wet	1-2-Diphenylhydrazine	µg/L	12/9/2006	1/24/2013	27	27	0.44	-	-	0.50	-	0	CTR	0.54	0.00	0 exceedances in 7 Year(s)	0%
Wet	2-4'-DDD	µg/L	12/9/2006	2/13/2009	11	11	0.02	-	-	0.03	-						
Wet	2-4'-DDE	µg/L	12/9/2006	2/13/2009	11	11	0.02	-	-	0.03	-						
Wet	2-4'-DDT	µg/L	12/9/2006	2/13/2009	11	11	0.00	-	-	0.00	-						
Wet	2-4-6-trichlophenol	µg/L	12/9/2006	2/13/2009	11	11	0.36	-	-	0.50	-						
Wet	2-4-Dinitrotoluene	µg/L	12/9/2006	1/24/2013	27	27	2.22	-	-	2.50	-	0			0.00		
Wet	2-4-dimethylphenol	µg/L	12/9/2006	1/24/2013	28	28	0.89	-	-	1.00	-						
Wet	Benzo[b]fluoranthene	µg/L	12/9/2006	1/24/2013	27	27	2.98	-	-	5.00	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Benzo[g-h-i]perylene	µg/L	12/9/2006	1/24/2013	27	27	1.56	-	-	2.50	-						
Wet	Beryllium	µg/L	2/27/2006	1/24/2013	37	35	0.26	-	0.416	0.25	0.155						
Wet	Dibenzo(a-h)anthracene	µg/L	12/9/2006	1/24/2013	27	27	0.04	-	-	0.05	-	0	CTR	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Endrin ketone	µg/L	12/9/2006	2/13/2009	11	11	0.36	-	-	0.50	-						
Wet	Mercury	µg/L	2/27/2006	1/24/2013	37	32	0.16	-	0.177	0.25	0.08	0	0.00	0.05	0.00	0 exceedances in 7 Year(s)	0%
Wet	Methoxychlor	µg/L	12/9/2006	1/24/2013	27	27	0.22	-	-	0.25	-						
Wet	Methylene Blue Active Substances (MBAS)	mg/L	12/9/2006	1/24/2013	27	5	0.74	0.183	3.96	0.46	0.57						
Wet	PCB-1016 (Aroclor 1016)	µg/L	12/9/2006	1/24/2013	27	27	0.16	-	-	0.25	-						
Wet	PCB-1221 (Aroclor 1221)	µg/L	12/9/2006	1/24/2013	29	29	0.17	-	-	0.25	-						
Wet	PCB-1232 (Aroclor 1232)	µg/L	12/9/2006	1/24/2013	27	27	0.16	-	-	0.25	-						
Wet	PCB-1242 (Aroclor 1242)	µg/L	12/9/2006	1/24/2013	27	27	0.16	-	-	0.25	-						
Wet	PCB-1248 (Aroclor 1248)	µg/L	12/9/2006	1/24/2013	27	27	0.16	-	-	0.25	-						
Wet	PCB-1254 (Aroclor 1254)	µg/L	12/9/2006	1/24/2013	27	27	0.16	-	-	0.25	-						
Wet	PCB-1260 (Aroclor 1260)	µg/L	12/9/2006	1/24/2013	27	27	0.16	-	-	0.25	-						
Wet	Thallium	µg/L	2/27/2006	1/24/2013	37	37	0.36	-	0.179	0.50	-						
Wet	Phenolics- Total recoverable	mg/L	11/1/2006	1/24/2013	30	27	0.06	-	0.235	0.05	0.13						
Wet	Total Petroleum Hydrocarbons	mg/L	11/1/2006	1/24/2013	30	21	2.48	-	5.9	2.50	2.3						
Wet	Phosphorus- Total (as P)	mg/L	12/9/2006	1/24/2013	27		0.45	0.2	1.25	0.34	0.34						
Wet	Nitrate (NO3)	mg/L	12/9/2006	1/24/2013	21		4.77	2.23	14.8	3.55	3.55	0	Basin Plan	45.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Ammonia	mg/l	2/27/2006	1/24/2013	37	4	0.78	-	3.35	0.48	0.508	0	Basin Plan	3.74	0.00	0 exceedances in 7 Year(s)	0%
Wet	Selenium	µg/L	2/27/2006	1/24/2013	37	23	0.79	-	2.10	0.50	0.78						
Wet	Carbofuran	µg/L	9/21/2007	12/18/2007	4	4	2.50	-	-	2.50	-						
Wet	1-2-Benzanthracene	µg/L	11/4/2008	1/24/2013	20	20	2.00	-	-	2.50	-						
Wet	2-4-6-Trichlorophenol	µg/L	11/4/2008	1/24/2013	17	17	4.74	-	-	5.00	-						
Wet	N-Nitrosodimethylamine	µg/L	11/4/2008	1/24/2013	17	17	2.50	-	-	2.50	-	0	CTR	8.10	0.00	0 exceedances in 5 Year(s)	0%

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Weather	Constituent	Unit	Dates Sampled		Total No. of Values	No. with/ ND	Min.	Max.	Avg.	Median		No of Exceed.	Regulatory Source	Regulatory Threshold	Exceed. Frequency(# of exceed. per year)	Exceedance/Time	%Exceed
			From	To						With ND	Without ND						
Wet	N-Nitrosodiphenylamine	µg/L	11/4/2008	1/24/2013	17	17	0.50	-	-	0.50	-	0	CTR	16.00	0.00	0 exceedances in 5 Year(s)	0%
Wet	Aluminum	µg/L	2/27/2006	1/24/2013	37		2,381.31	20.90	14,200.00	1,500.00	1,500.00						
Wet	Arsenic	µg/L	2/27/2006	1/24/2013	37	1	2.46	-	7.88	2.17	2.18	0	CTR	350.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Barium	µg/L	12/9/2006	1/24/2013	27	2	107.39	-	389.00	66.60	76.80						
Wet	Silver	µg/L	2/27/2006	1/24/2013	37	29	0.82	-	1.91	0.14	0.49						
Wet	Copper	µg/L	2/27/2006	1/24/2013	37	1	89.86	-	565.00	49.20	50.30						
Wet	Iron	µg/L	2/27/2006	1/24/2013	37		3,676.65	118.00	24,800.00	2,550.00	2,550.00						
Wet	Lead	µg/L	2/27/2006	1/24/2013	37		46.52	0.88	806.00	18.50	18.50						
Wet	Zinc	µg/L	2/27/2006	1/24/2013	37		419.63	27.40	2,250.00	237.00	237.00						
Wet	Alkalinity as CaCO3	mg/L	12/9/2006	1/24/2013	26		44.45	14.30	124.30	28.00	28.00						
Wet	Hardness as CaCO3	mg/L	12/9/2006	1/24/2013	27		73.89	30	190	50.00	50						
Wet	Chromium +6	µg/L	12/9/2006	1/24/2013	28	18	1.25	-	1.8	0.71	0.54						
Wet	Alkalinity as Bicarbonate	mg/L	10/6/2010	11/20/2011	5	1	31.98	-	83	16.50	30.8						
Wet	E. Coli	MPN/100mL	10/11/2012	1/24/2013	5		12,578.84	2419.2	34500	7,915.00	7915	5	Basin Plan	235.00	3.48	5 exceedances in 1 Year(s)	100%
Wet	Antimony	µg/L	2/27/2006	1/24/2013	37	1	5.10	-	18.6	3.80	3.85	0	CTR	4,300.00	0.00	0 exceedances in 7 Year(s)	0%
Wet	Benzioic Acid	µG/L	10/17/2004	1/7/2005	4	4	-	-	-	-	-						
Wet	Benzyl alcohol	µG/L	10/17/2004	1/7/2005	4	4	-	-	-	-	-						
Wet	Alkalinity (mg/L as CaCO3)	mg/L as CaCO3	2/27/2006	2/28/2006	10		69.60	14	220	22.00	22						
Wet	Baryium	µg/L	2/27/2006	2/28/2006	10		41.55	13.20	82.60	25.65	25.65						
Wet	Cobalt	µg/L	2/27/2006	2/28/2006	10		0.82	0.27	2.34	0.65	0.65						
Wet	Detectable DDTs (µg/L)	µg/L	2/27/2006	2/28/2006	10	10	#DIV/0!	0.00	0.00	#NUM!	-						
Wet	Dissolved Organic Carbon	mg/L	2/27/2006	2/28/2006	10		10.84	5.60	25.00	8.35	8.35						
Wet	Manganese	µg/L	2/27/2006	2/28/2006	10		37.74	11.40	137.00	20.40	20.40						
Wet	Molybdenum	µg/L	2/27/2006	2/28/2006	10		2.99	0.45	8.97	1.36	1.36						
Wet	Other Pesticides (µg/L)	µg/L	2/27/2006	2/28/2006	10	10	-	-	-	-	-						
Wet	Strontium	µg/L	2/27/2006	2/28/2006	10		248.06	30.70	826.00	62.55	62.55						
Wet	Tin	µg/L	2/27/2006	2/28/2006	10		0.21	0.13	0.34	0.21	0.21						
Wet	Titanium	µg/L	2/27/2006	2/28/2006	10		11.76	1.60	23.60	11.15	11.15						
Wet	Total Aroclors	µg/L	2/27/2006	2/28/2006	10	10	-	-	-	-	-						
Wet	Total PAHs (ng/L)	ng/L	2/27/2006	2/28/2006	10		986.83	53.70	3,652.60	614.30	614.30						
Wet	Vanadium	µg/L	2/27/2006	2/28/2006	10		3.77	2.15	8.36	3.16	3.16						

Notes:
Water quality data available but no screening criteria was determined.
Source:
Mass Emissions Monitoring.
Appendix B 2002-2006 Sampling Results for Dominguez Channel

Table E.4: Dominguez Channel - Bacteria Data Summary

Waterbody	Weather	Location	Constituent	Dates Sampled		Total No. of Values	Min.	Max.	Avg.	Median	No. of Exceed.	Regulatory Threshold	Regulatory Source	Exceed. Frequency (# exceed. per year)	Exceedance/Time	%Exceed
				From	To											
Dominguez Channel	Dry	El Segundo Blvd.	E. coli (MPN/100 mL)	4/3/2001	5/26/2009	246	100	240,000	3,192	310	22	235	Basin Plan	0.01	22 exceedances in 9 Year(s)	9%
Dominguez Channel	Dry	El Segundo Blvd.	Enterococcus (MPN/100 mL)	4/3/2001	5/26/2009	244	10	12,000	456	310						
Dominguez Channel	Dry	El Segundo Blvd.	Total Coliform (MPN/100 mL)	4/3/2001	5/26/2009	246	100	240,000	59,819	310						
Dominguez Channel	Dry	"Tributary @ Carson Plaza Dr.	E. coli (MPN/100 mL)	1/17/2002	5/26/2009	63	100	73,000	4,047	2,800	11	235	Basin Plan	0.02	11 exceedances in 8 Year(s)	17%
Dominguez Channel	Dry	"Tributary @ Carson Plaza Dr.	Enterococcus (MPN/100 mL)	1/17/2002	5/26/2009	63	31	24,000	3,896	2,800						
Dominguez Channel	Dry	"Tributary @ Carson Plaza Dr.	Total Coliform (MPN/100 mL)	1/17/2002	5/26/2009	63	1,600	240,000	141,392	2,800						
Dominguez Channel	Dry	Tributary @ Main St.	E. coli (MPN/100 mL)	3/31/2005	5/26/2009	44	100	240,000	10,298	3,950	12	235	Basin Plan	0.07	12 exceedances in 5 Year(s)	27%
Dominguez Channel	Dry	Tributary @ Main St.	Enterococcus (MPN/100 mL)	3/31/2005	5/26/2009	44	20	24,000	2,832	3,950						
Dominguez Channel	Dry	Tributary @ Main St.	Total Coliform (MPN/100 mL)	3/31/2005	5/26/2009	44	19,000	240,000	146,750	3,950						
Dominguez Channel	Dry	Vermont Ave.	E. coli (MPN/100 mL)	1/20/2005	5/26/2009	127	100	77,000	3,553	1,500	20	235	Basin Plan	0.04	20 exceedances in 5 Year(s)	16%
Dominguez Channel	Dry	Vermont Ave.	Enterococcus (MPN/100 mL)	1/20/2005	5/26/2009	127	10	6,500	518	1,500						
Dominguez Channel	Dry	Vermont Ave.	Total Coliform (MPN/100 mL)	1/20/2005	5/26/2009	127	5,900	240,000	125,484	1,500						
Dominguez Channel	Dry	Western Ave.	E. coli (MPN/100 mL)	4/3/2001	5/26/2009	246	100	120,000	2,571	1,100	25	235	Basin Plan	0.01	25 exceedances in 9 Year(s)	10%
Dominguez Channel	Dry	Western Ave.	Enterococcus (MPN/100 mL)	4/3/2001	5/26/2009	244	10	16,000	656	1,100						
Dominguez Channel	Dry	Western Ave.	Total Coliform (MPN/100 mL)	4/3/2001	5/26/2009	246	100	240,000	82,327	1,100						
Dominguez Channel	Dry	Yukon Ave.	E. coli (MPN/100 mL)	1/17/2002	5/26/2009	76	100	46,000	3,827	1,250	13	235	Basin Plan	0.02	13 exceedances in 8 Year(s)	17%
Dominguez Channel	Dry	Yukon Ave.	Enterococcus (MPN/100 mL)	1/17/2002	5/26/2009	76	10	24,000	4,010	1,250						
Dominguez Channel	Dry	Yukon Ave.	Total Coliform (MPN/100 mL)	1/17/2002	5/26/2009	76	100	240,000	83,370	1,250						
Dominguez Channel	Wet	El Segundo Blvd.	E. coli (MPN/100 mL)	2/19/2002	12/23/2008	37	100	19,000	3,714	980	9	235	Basin Plan	0.04	9 exceedances in 7 Year(s)	24%
Dominguez Channel	Wet	El Segundo Blvd.	Enterococcus (MPN/100 mL)	2/19/2002	12/23/2008	37	10	17,000	1,761	980						
Dominguez Channel	Wet	El Segundo Blvd.	Total Coliform (MPN/100 mL)	2/19/2002	12/23/2008	37	100	240,000	88,609	980						
Dominguez Channel	Wet	"Tributary @ Carson Plaza Dr.	E. coli (MPN/100 mL)	2/27/2003	1/31/2008	11	100	41,000	8,631	14,000	5	235	Basin Plan	0.09	5 exceedances in 5 Year(s)	45%
Dominguez Channel	Wet	"Tributary @ Carson Plaza Dr.	Enterococcus (MPN/100 mL)	2/27/2003	1/31/2008	11	52	24,000	10,497	14,000						
Dominguez Channel	Wet	"Tributary @ Carson Plaza Dr.	Total Coliform (MPN/100 mL)	2/27/2003	1/31/2008	11	14,000	240,000	157,364	14,000						
Dominguez Channel	Wet	Tributary @ Main St.	E. coli (MPN/100 mL)	1/27/2005	12/23/2008	7	410	160,000	26,197	8,200	4	235	Basin Plan	0.15	4 exceedances in 4 Year(s)	57%
Dominguez Channel	Wet	Tributary @ Main St.	Enterococcus (MPN/100 mL)	1/27/2005	12/23/2008	7	200	24,000	5,624	8,200						
Dominguez Channel	Wet	Tributary @ Main St.	Total Coliform (MPN/100 mL)	1/27/2005	12/23/2008	7	40,000	240,000	167,286	8,200						
Dominguez Channel	Wet	Vermont Ave.	E. coli (MPN/100 mL)	1/6/2005	12/23/2008	21	100	240,000	15,481	4,100	8	235	Basin Plan	0.10	8 exceedances in 4 Year(s)	38%
Dominguez Channel	Wet	Vermont Ave.	Enterococcus (MPN/100 mL)	1/6/2005	12/23/2008	21	10	24,000	2,479	4,100						
Dominguez Channel	Wet	Vermont Ave.	Total Coliform (MPN/100 mL)	1/6/2005	12/23/2008	21	1,100	240,000	128,319	4,100						
Dominguez Channel	Wet	Western Ave.	E. coli (MPN/100 mL)	2/19/2002	12/23/2008	37	100	110,000	6,326	1,600	6	235	Basin Plan	0.02	6 exceedances in 7 Year(s)	16%
Dominguez Channel	Wet	Western Ave.	Enterococcus (MPN/100 mL)	2/19/2002	12/23/2008	37	10	24,000	1,952	1,600						
Dominguez Channel	Wet	Western Ave.	Total Coliform (MPN/100 mL)	2/19/2002	12/23/2008	37	100	240,000	85,251	1,600						
Dominguez Channel	Wet	Yukon Ave.	E. coli (MPN/100 mL)	2/27/2003	12/23/2008	12	100	16,000	3,588	5,950	3	235	Basin Plan	0.04	3 exceedances in 6 Year(s)	25%
Dominguez Channel	Wet	Yukon Ave.	Enterococcus (MPN/100 mL)	2/27/2003	12/23/2008	12	10	24,000	7,173	5,950						
Dominguez Channel	Wet	Yukon Ave.	Total Coliform (MPN/100 mL)	2/27/2003	12/23/2008	12	740	240,000	108,762	5,950						
Dominguez Channel (Estuary)	Dry	Henry Ford Ave.	E. coli (MPN/100 mL)	4/3/2001	5/26/2009	242	100	240,000	1,698	100						
Dominguez Channel (Estuary)	Dry	Henry Ford Ave.	Enterococcus (MPN/100 mL)	4/3/2001	5/26/2009	240	10	24,000	263	100	12	104	Basin Plan Amendment	0.01	12 exceedances in 9 Year(s)	5%
Dominguez Channel (Estuary)	Dry	Wilmington Ave.	Enterococcus (MPN/100 mL)	4/3/2001	5/26/2009	244	10	24,000	238	185	31	104	Basin Plan Amendment	0.02	31 exceedances in 9 Year(s)	13%
Dominguez Channel (Estuary)	Dry	Wilmington Ave.	E. coli (MPN/100 mL)	4/3/2001	5/26/2009	246	100	46,000	697	185						

Notes:
Water quality data available but no screening criteria was determined.
Source:
City of Los Angeles Department of Public Works Bureau of Sanitation
Watershed Protection Division - Pollutant Assessment Section
Status and Trends Monitoring in Dominguez Channel (Main Stem)
Fecal Indicator Bacteria

Table E.5: Machado Lake - Water Quality Data Summary

Location	Weather	Constituent	Units	Total No. of Values	No. Values with ND	Dates Sampled		Min.	Max.	Avg.	Median		No. of Exceed.	Regulatory Threshold	Regulatory Source	Exceed. Frequency (# exceed. per year)
						From	To				w/o ND	w/ND				
ML-1	Undefined	E. Coli	(MPN/100mL)	56	0	12/20/2007	9/29/2008	100	1,400	278	150.00	150.00	25	235	Basin Plan	0.35
ML-1	Undefined	Ent.	(MPN/100mL)	56	0	12/20/2007	9/29/2008	10	3,600	148	67.50	67.50				
ML-1	Undefined	Tot. Coli.	(MPN/100mL)	55	0	12/20/2007	9/29/2008	520	240,000	58,179	28,000.00	28,000.00				
ML-1	Dry	(EMD Lab) Chlorophyll-a	µg/L	55	0	5/19/2008	2/7/2011	6	234	52	53.00	47.00	43	20	TMDL	2.13
ML-1	Dry	Alkalinity	mg/L	32	0	10/25/2007	5/4/2009	60	254	145	136.00	136.00				
ML-1	Dry	Hardness	mg/L	27	0	10/25/2007	5/4/2009	91.4	473	252	241.00	241.00				
ML-1	Dry	Inorganic Nitrogen	mg/L	105	0	6/16/2006	2/7/2011	0.04	0.68	0	0.16	0.05				
ML-1	Dry	Kjeldhal-N	mg/L	92	0	10/25/2007	2/7/2011	0.16	5	2	1.55	1.55				
ML-1	Dry	NH3-N	mg/L	106	0	6/16/2006	2/7/2011	0.05	0.53	0	0.08	0.05				
ML-1	Dry	NO2	mg/L	106	0	6/16/2006	2/7/2011	0.046	0.14	0	0.07	0.02				
ML-1	Dry	NO3	mg/L	106	0	6/16/2006	2/7/2011	0.04	0.33	0	0.10	0.02	0	45	Basin Plan	0.00
ML-1	Dry	Organic-N	mg/L	92	0	10/25/2007	2/7/2011	0.11	5	2	1.50	1.50				
ML-1	Dry	Ortho-Phosphorus	mg/L	106	0	6/16/2006	2/7/2011	0.13	1.61	1	0.64	0.64				
ML-1	Dry	TDS	mg/L	67	0	6/16/2006	2/7/2011	84	1108	527	508.00	492.00				
ML-1	Dry	Total Nitrogen	mg/L	106	0	6/16/2006	2/7/2011	0.3	5	2	1.82	1.82	89	1	TMDL	3.90
ML-1	Dry	Total Phosphate	mg/L	106	0	6/16/2006	2/7/2011	0.31	1.91	1	0.81	0.81				
ML-1	Dry	TSS	mg/L	103	0	6/16/2006	2/7/2011	2.4	148	31	29.50	29.00				
ML-1	Wet	(EMD Lab) Chlorophyll-a	µg/L	2	0	5/23/2008	2/17/2009	74.3	74.3	40	74.30	40.15	1	20	TMDL	0.37
ML-1	Wet	Alkalinity	mg/L	4	0	12/20/2007	2/17/2009	16	42	31	33.00	33.00				
ML-1	Wet	Hardness	mg/L	4	0	12/20/2007	2/17/2009	45.4	74	60	59.60	59.60				
ML-1	Wet	Inorganic Nitrogen	mg/L	6	0	4/17/2007	2/17/2009	0.46	0.64	0	0.57	0.52				
ML-1	Wet	Kjeldhal-N	mg/L	5	0	12/20/2007	2/17/2009	0.4	2.5	1	0.70	0.70				
ML-1	Wet	NH3-N	mg/L	6	0	4/17/2007	2/17/2009	0.1	0.2	0	0.10	0.10				
ML-1	Wet	NO2	mg/L	6	0	4/17/2007	2/17/2009	0	0	0	0.02	0.02				
ML-1	Wet	NO3	mg/L	6	0	4/17/2007	2/17/2009	0.39	0.49	0	0.45	0.42	0	45	Basin Plan	0.00
ML-1	Wet	Organic-N	mg/L	5	0	12/20/2007	2/17/2009	0.4	2.4	1	0.60	0.60				
ML-1	Wet	Ortho-Phosphorus	mg/L	6	0	4/17/2007	2/17/2009	0.29	0.71	0	0.43	0.43				
ML-1	Wet	TDS	mg/L	5	0	4/17/2007	2/17/2009	120	612	237	146.00	146.00				
ML-1	Wet	Total Nitrogen	mg/L	6	0	4/17/2007	2/17/2009	0.86	3.26	2	1.35	1.35	5	1	TMDL	1.53
ML-1	Wet	Total Phosphate	mg/L	6	0	4/17/2007	2/17/2009	0.39	1.13	1	0.43	0.43				
ML-1	Wet	TSS	mg/L	6	0	4/17/2007	2/17/2009	11	72	27	20.00	20.00				
ML-1	Undefined	ALGAL BIOMASS	µg/L(mg/M3)	41	8	4/4/2011	12/10/2012	10	166	32	31.00	26.00				
ML-1	Undefined	AMMONIA-N	mg/L	39	35	4/4/2011	12/26/2012	0.1	0.21	0	0.14	0.03	0	2.15	TMDL	0.00
ML-1	Undefined	LAKE DEPTH	ft	46	0	4/4/2011	12/26/2012	2	4.58	3	3.50	3.50				
ML-1	Undefined	NITRATE-N	mg/L	35	30	4/4/2011	12/26/2012	0.13	0.68	0	0.38	0.01	0	10	Basin Plan	0.00
ML-1	Undefined	NITRITE-N	mg/L	43	43	4/4/2011	12/26/2012	0	0	0	0.00	0.01	0	1	Basin Plan	0.00
ML-1	Undefined	ORGANIC-N	mg/L	46	1	4/4/2011	12/26/2012	0.17	3.48	1	0.91	0.86				
ML-1	Undefined	OXYGEN (DISSOLVED)	mg/L	46	0	4/4/2011	12/26/2012	0.17	8.5	4	3.50	3.50	38	5	TMDL	1.43
ML-1	Undefined	PHOSPHORUS (ORTHO)	mg/L	46	0	4/4/2011	12/26/2012	0.29	1.2	1	0.66	0.66				
ML-1	Undefined	PHOSPHORUS (TOTAL)	mg/L	46	0	4/4/2011	12/26/2012	0.33	1.39	1	0.77	0.77	46	0.1	TMDL	1.73
ML-1	Undefined	SECCHI DEPTH	in	46	0	4/4/2011	12/26/2012	10	45	25	25.00	25.00				
ML-1	Undefined	SUSPENDED SOLIDS	mg/L	46	0	4/4/2011	12/26/2012	2.3	117	18	9.50	9.50				
ML-1	Undefined	TOTAL DISSOLVED SOLIDS	mg/L	46	0	4/4/2011	12/26/2012	80	668	357	334.00	334.00				
ML-1	Undefined	TURBIDITY	NTU	46	0	4/4/2011	12/26/2012	1.4	51.9	9	6.45	6.45				
ML-2	Undefined	E. Coli	(MPN/100mL)	56	0	12/20/2007	9/29/2008	100	1,100	237	200.00	200.00	19	235	Basin Plan	0.26
ML-2	Undefined	Ent.	(MPN/100mL)	56	0	12/20/2007	9/29/2008	10	4,300	148	63.00	63.00				
ML-2	Undefined	Tot. Coli.	(MPN/100mL)	55	0	12/20/2007	9/29/2008	410	240,000	55,284	25,000.00	25,000.00				
ML-2	Dry	(EMD Lab) Chlorophyll-a	µg/L	55	0	5/19/2008	2/7/2011	7	170	51	50.00	50.00	46	20	TMDL	2.28
ML-2	Dry	Alkalinity	mg/L	32	0	10/25/2007	5/4/2009	58	250	143	136.00	136.00				
ML-2	Dry	Hardness	mg/L	27	0	10/25/2007	5/4/2009	85	466	250	247.00	247.00				
ML-2	Dry	Inorganic Nitrogen	mg/L	106	0	6/16/2006	2/7/2011	0.03	0.7	0	0.16	0.05				
ML-2	Dry	Kjeldhal-N	mg/L	92	0	10/25/2007	2/7/2011	0.3	3.3	2	1.69	1.69				
ML-2	Dry	NH3-N	mg/L	106	0	6/16/2006	2/7/2011	0.05	0.58	0	0.09	0.05				
ML-2	Dry	NO2	mg/L	106	0	6/16/2006	2/7/2011	0.04	0.28	0	0.07	0.02				
ML-2	Dry	NO3	mg/L	106	0	6/16/2006	2/7/2011	0.03	0.34	0	0.12	0.02	0	45	Basin Plan	0.00
ML-2	Dry	Organic-N	mg/L	92	0	10/25/2007	2/7/2011	0.3	3.3	2	1.62	1.62				
ML-2	Dry	Ortho-Phosphorus	mg/L	106	0	6/16/2006	2/7/2011	0.2	1.44	1	0.64	0.64				
ML-2	Dry	TDS	mg/L	67	0	6/16/2006	2/7/2011	32	1090	526	480.00	480.00				

Table E.5: Machado Lake - Water Quality Data Summary

Location	Weather	Constituent	Units	Total No. of Values	No. Values with ND	Dates Sampled		Min.	Max.	Avg.	Median		No. of Exceed.	Regulatory Threshold	Regulatory Source	Exceed. Frequency (# exceed. per year)
						From	To				w/o ND	w/ND				
ML-2	Dry	Total Nitrogen	mg/L	106	0	6/16/2006	2/7/2011	0.3	4.62	2	1.79	1.79	92	1	TMDL	4.04
ML-2	Dry	Total Phosphate	mg/L	106	0	6/16/2006	2/7/2011	0.33	1.51	1	0.80	0.80				
ML-2	Dry	TSS	mg/L	104	0	6/16/2006	2/7/2011	3.2	91	29	27.50	27.50				
ML-2	Wet	(EMD Lab) Chlorophyll-a	µg/L	2	0	5/23/2008	2/17/2009	60.8	60.80	33.40	60.80	33.40	1	20	TMDL	0.37
ML-2	Wet	Alkalinity	mg/L	4	0	12/20/2007	2/17/2009	22	54.00	35.50	33.00	33.00				
ML-2	Wet	Hardness	mg/L	4	0	12/20/2007	2/17/2009	31.1	83.50	53.38	49.45	49.45				
ML-2	Wet	Inorganic Nitrogen	mg/L	5	0	12/20/2007	2/17/2009	0.41	0.60	0.43	0.52	0.47				
ML-2	Wet	Kjeldhal-N	mg/L	5	0	12/20/2007	2/17/2009	0.48	1.60	0.96	0.87	0.87				
ML-2	Wet	NH3-N	mg/L	5	0	12/20/2007	2/17/2009	0.07	0.18	0.11	0.13	0.09				
ML-2	Wet	NO2	mg/L	5	0	12/20/2007	2/17/2009	0	0.00	0.02	0.02	0.02				
ML-2	Wet	NO3	mg/L	5	0	12/20/2007	2/17/2009	0.34	0.42	0.30	0.37	0.36	0	45	Basin Plan	0.00
ML-2	Wet	Organic-N	mg/L	5	0	12/20/2007	2/17/2009	0.3	1.60	0.86	0.70	0.70				
ML-2	Wet	Ortho-Phosphorus	mg/L	5	0	12/20/2007	2/17/2009	0.32	0.58	0.44	0.46	0.46				
ML-2	Wet	TDS	mg/L	4	0	12/20/2007	2/17/2009	93	160.00	128.25	130.00	130.00				
ML-2	Wet	Total Nitrogen	mg/L	5	0	12/20/2007	2/17/2009	0.9	1.60	1.30	1.27	1.27	4	1	TMDL	0.93
ML-2	Wet	Total Phosphate	mg/L	5	0	12/20/2007	2/17/2009	0.38	0.78	0.51	0.45	0.45				
ML-2	Wet	TSS	mg/L	5	0	12/20/2007	2/17/2009	13	44.00	23.40	17.00	17.00				
ML-2	Undefined	ALGAL BIOMASS	µg/L(mg/M3)	42	9	4/4/2011	12/10/2012	12	103	32	29.00	26.50				
ML-2	Undefined	AMMONIA-N	mg/L	39	35	4/4/2011	12/26/2012	0.15	0.35	0	0.15	0.03	0	2.15	TMDL	0.00
ML-2	Undefined	LAKE DEPTH	ft	46	0	4/4/2011	12/26/2012	3.08	4.83	4	4.25	4.25				
ML-2	Undefined	NITRATE-N	mg/L	38	33	5/2/2011	12/26/2012	0.12	0.63	0	0.27	0.01	0	10	Basin Plan	0.00
ML-2	Undefined	NITRITE-N	mg/L	44	44	4/4/2011	12/26/2012	0	0	0	0.00	0.01	0	1	Basin Plan	0.00
ML-2	Undefined	ORGANIC-N	mg/L	46	0	4/4/2011	12/26/2012	0.27	3.87	1	1.00	1.00				
ML-2	Undefined	OXYGEN (DISSOLVED)	mg/L	46	0	4/4/2011	12/26/2012	0.08	8.17	3	2.57	2.57	42	5	TMDL	1.58
ML-2	Undefined	PHOSPHORUS (ORTHO)	mg/L	46	0	4/4/2011	12/26/2012	0.3	1.23	1	0.61	0.61				
ML-2	Undefined	PHOSPHORUS (TOTAL)	mg/L	46	0	4/4/2011	12/26/2012	0.33	1.37	1	0.71	0.71	46	0.1	TMDL	1.73
ML-2	Undefined	SECCHI DEPTH	in	46	0	4/4/2011	12/26/2012	11	52	26	25.00	25.00				
ML-2	Undefined	SUSPENDED SOLIDS	mg/L	46	0	4/4/2011	12/26/2012	1.4	35.5	13	9.10	9.10				
ML-2	Undefined	TOTAL DISSOLVED SOLIDS	mg/L	46	0	4/4/2011	12/26/2012	80	672	356	344.00	344.00				
ML-2	Undefined	TURBIDITY	NTU	46	0	4/4/2011	12/26/2012	1.3	17.7	7	5.80	5.80				
ML-3	Undefined	E. Coli	(MPN/100mL)	56	0	12/20/2007	9/29/2008	100	2,300	604	515.00	515.00	44	235	Basin Plan	0.61
ML-3	Undefined	Ent.	(MPN/100mL)	56	0	12/20/2007	9/29/2008	10	3,500	325	255.00	255.00				
ML-3	Undefined	Tot. Coli.	(MPN/100mL)	55	0	12/20/2007	9/29/2008	1,200	240,000	57,104	28,000.00	28,000.00				
ML-3	Dry	(EMD Lab) Chlorophyll-a	µg/L	20	0	5/19/2008	9/29/2008	40	88	61	60.50	60.50	20	20	TMDL	0.36
ML-3	Dry	Inorganic Nitrogen	mg/L	47	0	5/19/2008	9/29/2008	0.05	0.19	0	0.12	0.05				
ML-3	Dry	Kjeldhal-N	mg/L	47	0	5/19/2008	9/29/2008	0.3	3.3	2	1.75	1.70				
ML-3	Dry	NH3-N	mg/L	47	0	5/19/2008	9/29/2008	0.05	0.09	0	0.06	0.05				
ML-3	Dry	NO2	mg/L	47	0	5/19/2008	9/29/2008	0.14	0.19	0	0.17	0.02				
ML-3	Dry	NO3	mg/L	47	0	5/19/2008	9/29/2008	0	0	0	0.02	0.02	0	45	Basin Plan	0.00
ML-3	Dry	Organic-N	mg/L	47	0	5/19/2008	9/29/2008	0.3	3.3	2	1.80	1.80				
ML-3	Dry	Ortho-Phosphorus	mg/L	47	0	5/19/2008	9/29/2008	0.33	1	1	0.68	0.68				
ML-3	Dry	Total Nitrogen	mg/L	47	0	5/19/2008	9/29/2008	0.3	3.3	2	1.89	1.89	45	1	TMDL	0.35
ML-3	Dry	Total Phosphate	mg/L	47	0	5/19/2008	9/29/2008	0.52	1.22	1	0.81	0.81				
ML-3	Dry	TSS	mg/L	47	0	5/19/2008	9/29/2008	22	70	39	38.00	38.00				
ML-3	Wet	(EMD Lab) Chlorophyll-a	µg/L	1	0	5/23/2008	5/23/2008	73.90	73.90	73.90	73.90	73.90	1	20	TMDL	0.00
ML-3	Wet	Inorganic Nitrogen	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.05	0.05	0.05				
ML-3	Wet	Kjeldhal-N	mg/L	1	0	5/23/2008	5/23/2008	1.47	1.47	1.47	1.47	1.47				
ML-3	Wet	NH3-N	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.05	0.05	0.05				
ML-3	Wet	NO2	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.02	0.02	0.02				
ML-3	Wet	NO3	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.02	0.02	0.02	0	45	Basin Plan	0.00
ML-3	Wet	Organic-N	mg/L	1	0	5/23/2008	5/23/2008	1.47	1.47	1.47	1.47	1.47				
ML-3	Wet	Ortho-Phosphorus	mg/L	1	0	5/23/2008	5/23/2008	0.57	0.57	0.57	0.57	0.57				
ML-3	Wet	Total Nitrogen	mg/L	1	0	5/23/2008	5/23/2008	1.47	1.47	1.56	1.56	1.56	1	1	TMDL	0.00
ML-3	Wet	Total Phosphate	mg/L	1	0	5/23/2008	5/23/2008	0.76	0.76	0.76	0.76	0.76				
ML-3	Wet	TSS	mg/L	1	0	5/23/2008	5/23/2008	52.00	52.00	52.00	52.00	52.00				
ML-4	Undefined	E. Coli	(MPN/100mL)	47	0	5/19/2008	9/29/2008	100	520	157	100.00	100.00	8	235	Basin Plan	0.06
ML-4	Undefined	Ent.	(MPN/100mL)	47	0	5/19/2008	9/29/2008	10	270	43	30.00	30.00				
ML-4	Undefined	Tot. Coli.	(MPN/100mL)	46	0	5/19/2008	9/29/2008	2,200	240,000	54,120	25,000.00	25,000.00				

Table E.5: Machado Lake - Water Quality Data Summary

Location	Weather	Constituent	Units	Total No. of Values	No. Values with ND	Dates Sampled		Min.	Max.	Avg.	Median		No. of Exceed.	Regulatory Threshold	Regulatory Source	Exceed. Frequency (# exceed. per year)
						From	To				w/o ND	w/ND				
ML-4	Dry	(EMD Lab) Chlorophyll-a	µg/L	19	0	5/19/2008	9/26/2008	30.4	86.4	57	60.00	60.00	19	20	TMDL	0.36
ML-4	Dry	Inorganic Nitrogen	mg/L	47	0	5/19/2008	9/29/2008	0.05	0.14	0	0.15	0.05				
ML-4	Dry	Kjeldhal-N	mg/L	47	0	5/19/2008	9/29/2008	0.3	2.8	2	1.70	1.70				
ML-4	Dry	NH3-N	mg/L	47	0	5/19/2008	9/29/2008	0.05	0.11	0	0.09	0.05				
ML-4	Dry	NO2	mg/L	47	0	5/19/2008	9/29/2008	0.087	0.14	0	0.11	0.02				
ML-4	Dry	NO3	mg/L	47	0	5/19/2008	9/29/2008	0	0	0	0.02	0.02	0	45	Basin Plan	0.00
ML-4	Dry	Organic-N	mg/L	47	0	5/19/2008	9/29/2008	0.3	2.8	2	1.70	1.70				
ML-4	Dry	Ortho-Phosphorus	mg/L	47	0	5/19/2008	9/29/2008	0.33	0.96	1	0.68	0.68				
ML-4	Dry	Total Nitrogen	mg/L	47	0	5/19/2008	9/29/2008	0.3	2.8	2	1.79	1.79	44	1	TMDL	0.34
ML-4	Dry	Total Phosphate	mg/L	47	0	5/19/2008	9/29/2008	0.47	1.1	1	0.79	0.79				
ML-4	Dry	TSS	mg/L	47	0	5/19/2008	9/29/2008	14	58	34	34.00	34.00				
ML-4	Wet	(EMD Lab) Chlorophyll-a	µg/L	1	0	5/23/2008	5/23/2008	58.20	58.20	58.20	58.20	58.20	1	20	TMDL	0.00
ML-4	Wet	Inorganic Nitrogen	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.05	0.05	0.05				
ML-4	Wet	Kjeldhal-N	mg/L	1	0	5/23/2008	5/23/2008	1.30	1.30	1.30	1.30	1.30				
ML-4	Wet	NH3-N	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.05	0.05	0.05				
ML-4	Wet	NO2	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.02	0.02	0.02				
ML-4	Wet	NO3	mg/L	1	0	5/23/2008	5/23/2008	0.00	0.00	0.02	0.02	0.02	0	45	Basin Plan	0.00
ML-4	Wet	Organic-N	mg/L	1	0	5/23/2008	5/23/2008	1.30	1.30	1.30	1.30	1.30				
ML-4	Wet	Ortho-Phosphorus	mg/L	1	0	5/23/2008	5/23/2008	0.61	0.61	0.61	0.61	0.61				
ML-4	Wet	Total Nitrogen	mg/L	1	0	5/23/2008	5/23/2008	1.30	1.30	1.39	1.39	1.39	1	1	TMDL	0.00
ML-4	Wet	Total Phosphate	mg/L	1	0	5/23/2008	5/23/2008	0.82	0.82	0.82	0.82	0.82				
ML-4	Wet	TSS	mg/L	1	0	5/23/2008	5/23/2008	43	43	43	43.00	43.00				
ML-4	Undefined	ALGAL BIOMASS	µg/L(mg/M3)	45	45	4/4/2011	12/10/2012	0	0	3	0.00	3.00				
ML-4	Undefined	AMMONIA-N	mg/L	45	45	4/4/2011	12/26/2012	0	0	0	0.00	0.03	0	2.15	TMDL	0.00
ML-4	Undefined	NITRATE-N	mg/L	45	45	4/4/2011	12/26/2012	0	0	0	0.00	0.01	0	10	Basin Plan	0.00
ML-4	Undefined	NITRITE-N	mg/L	46	46	4/4/2011	12/26/2012	0	0	0	0.00	0.01	0	1	Basin Plan	0.00
ML-4	Undefined	ORGANIC-N	mg/L	46	45	4/4/2011	12/26/2012	0.84	0.84	0	0.84	0.05				
ML-4	Undefined	PHOSPHORUS (ORTHO)	mg/L	45	45	4/4/2011	12/26/2012	0	0	0	0.00	0.03				
ML-4	Undefined	PHOSPHORUS (TOTAL)	mg/L	46	46	4/4/2011	12/26/2012	0	0	0	0.00	0.03	0	0.1	TMDL	0.00
ML-4	Undefined	SUSPENDED SOLIDS	mg/L	46	42	4/4/2011	12/26/2012	1	1.9	1	1.10	0.50				
ML-4	Undefined	TOTAL DISSOLVED SOLIDS	mg/L	45	44	4/4/2011	12/26/2012	40	40	15	40.00	14.00				
ML-4	Undefined	TURBIDITY	NTU	46	10	4/4/2011	12/26/2012	0.1	0.6	0	0.10	0.10				
ML-4	Undefined	ALGAL BIOMASS	µg/L(mg/M3)	42	9	4/4/2011	12/10/2012	10	167	34	31.00	26.00				
ML-4	Undefined	AMMONIA-N	mg/L	39	34	4/4/2011	12/26/2012	0.1	0.21	0	0.11	0.03	0	2.15	TMDL	0.00
ML-4	Undefined	NITRATE-N	mg/L	40	35	4/4/2011	12/26/2012	0.12	0.63	0	0.24	0.01	0	10	Basin Plan	0.00
ML-4	Undefined	NITRITE-N	mg/L	44	44	4/4/2011	12/26/2012	0	0	0	0.00	0.01	0	1	Basin Plan	0.00
ML-4	Undefined	ORGANIC-N	mg/L	46	0	4/4/2011	12/26/2012	0.32	2.55	1	0.97	0.97				
ML-4	Undefined	PHOSPHORUS (ORTHO)	mg/L	46	0	4/4/2011	12/26/2012	0.3	1.19	1	0.65	0.65				
ML-4	Undefined	PHOSPHORUS (TOTAL)	mg/L	46	0	4/4/2011	12/26/2012	0.33	1.37	1	0.75	0.75	46	0.1	TMDL	1.73
ML-4	Undefined	SUSPENDED SOLIDS	mg/L	46	0	4/4/2011	12/26/2012	1.7	64.7	15	11.40	11.40				
ML-4	Undefined	TOTAL DISSOLVED SOLIDS	mg/L	46	0	4/4/2011	12/26/2012	80	696	363	348.00	348.00				
ML-4	Undefined	TURBIDITY	NTU	46	0	4/4/2011	12/26/2012	1.5	29.7	8	5.50	5.50				
Project 510 Drain	Undefined	E. Coli	(MPN/100mL)	1	0	12/26/2007	12/26/2007	100	100	100	100.00	100.00	0	235	Basin Plan	0.00
Project 510 Drain	Undefined	Ent.	(MPN/100mL)	1	0	12/26/2007	12/26/2007	10	10	10	10.00	10.00				
Project 510 Drain	Undefined	Tot. Coli.	(MPN/100mL)	1	0	12/26/2007	12/26/2007	100	100	100	100.00	100.00				
Project 510 Drain	Dry	Alkalinity	mg/L	27	0	10/19/2007	5/4/2009	84	144	113	114.00	114.00				
Project 510 Drain	Dry	Hardness	mg/L	23	0	10/19/2007	5/4/2009	189	340	256	254.00	254.00				
Project 510 Drain	Dry	Inorganic Nitrogen	mg/L	31	0	10/19/2007	6/29/2009	0.29	2.53	1	0.97	0.91				
Project 510 Drain	Dry	Kjeldhal-N	mg/L	31	0	10/19/2007	6/29/2009	0.3	7.51	2	1.40	1.40				
Project 510 Drain	Dry	NH3-N	mg/L	31	0	10/19/2007	6/29/2009	0.07	0.61	0	0.34	0.32				
Project 510 Drain	Dry	NO2	mg/L	31	0	10/19/2007	6/29/2009	0.04	0.31	0	0.08	0.02				
Project 510 Drain	Dry	NO3	mg/L	31	0	10/19/2007	6/29/2009	0.29	2.45	1	0.63	0.63	0	45	Basin Plan	0.00
Project 510 Drain	Dry	Organic-N	mg/L	31	0	10/19/2007	6/29/2009	0.2	7	1	1.10	1.10				
Project 510 Drain	Dry	Ortho-Phosphorus	mg/L	30	0	10/19/2007	6/29/2009	0.06	1.09	0	0.28	0.26				
Project 510 Drain	Dry	TDS	mg/L	29	0	10/19/2007	6/29/2009	456	804	619	636.00	636.00				
Project 510 Drain	Dry	Total Nitrogen	mg/L	31	0	10/19/2007	6/29/2009	0.71	8	3	2.18	2.18	29	1	TMDL	1.59
Project 510 Drain	Dry	Total Phosphate	mg/L	30	0	10/19/2007	6/29/2009	0.06	1.24	0	0.33	0.33				
Project 510 Drain	Dry	TSS	mg/L	30	0	10/19/2007	6/29/2009	1	864	36	4.00	3.15				

Table E.5: Machado Lake - Water Quality Data Summary

Location	Weather	Constituent	Units	Total No. of Values	No. Values with ND	Dates Sampled		Min.	Max.	Avg.	Median		No. of Exceed.	Regulatory Threshold	Regulatory Source	Exceed. Frequency (# exceed. per year)
						From	To				w/o ND	w/ND				
Project 510 Drain	Wet	Alkalinity	mg/L	1	0	11/30/2007	11/30/2007	14	14	14	14.00	14.00				
Project 510 Drain	Wet	Hardness	mg/L	1	0	11/30/2007	11/30/2007	15.1	15.1	15	15.10	15.10				
Project 510 Drain	Wet	Inorganic Nitrogen	mg/L	1	0	11/30/2007	11/30/2007	1.43	1.43	1	1.45	1.45				
Project 510 Drain	Wet	Kjeldhal-N	mg/L	1	0	11/30/2007	11/30/2007	1.39	1.39	1	1.39	1.39				
Project 510 Drain	Wet	NH3-N	mg/L	1	0	11/30/2007	11/30/2007	0.66	0.66	1	0.66	0.66				
Project 510 Drain	Wet	NO2	mg/L	1	0	11/30/2007	11/30/2007	0	0	0	0.02	0.02				
Project 510 Drain	Wet	NO3	mg/L	1	0	11/30/2007	11/30/2007	0.77	0.77	1	0.77	0.77	0	45	Basin Plan	0.00
Project 510 Drain	Wet	Organic-N	mg/L	1	0	11/30/2007	11/30/2007	0.73	0.73	1	0.73	0.73				
Project 510 Drain	Wet	Ortho-Phosphorus	mg/L	1	0	11/30/2007	11/30/2007	0.78	0.78	1	0.78	0.78				
Project 510 Drain	Wet	TDS	mg/L	1	0	11/30/2007	11/30/2007	36	36	36	36.00	36.00				
Project 510 Drain	Wet	Total Nitrogen	mg/L	1	0	11/30/2007	11/30/2007	2.16	2.16	2	2.18	2.18	1	1	TMDL	0.00
Project 510 Drain	Wet	Total Phosphate	mg/L	1	0	11/30/2007	11/30/2007	0.8	0.8	1	0.80	0.80				
Project 510 Drain	Wet	TSS	mg/L	1	0	11/30/2007	11/30/2007	130	130	130	130.00	130.00				
Project 77 Drain	Undefined	E. Coli	(MPN/100mL)	4	0	12/26/2007	2/27/2008	100	4600	1,278	205.00	205.00	2	235	Basin Plan	0.09
Project 77 Drain	Undefined	Ent.	(MPN/100mL)	4	0	12/26/2007	2/27/2008	10	480	128	10.00	10.00				
Project 77 Drain	Undefined	Tot. Coli.	(MPN/100mL)	4	0	12/26/2007	2/27/2008	100	29000	9,750	4,950.00	4,950.00				
Project 77 Drain	Dry	Alkalinity	mg/L	35	0	10/19/2007	5/4/2009	58	198	116	112.00	112.00				
Project 77 Drain	Dry	Hardness	mg/L	30	0	10/19/2007	5/4/2009	178	363	269	265.00	265.00				
Project 77 Drain	Dry	Inorganic Nitrogen	mg/L	41	0	10/19/2007	6/29/2009	0.53	2.79	1	1.02	1.02				
Project 77 Drain	Dry	Kjeldhal-N	mg/L	41	0	10/19/2007	6/29/2009	0.19	23.41	2	1.59	1.59				
Project 77 Drain	Dry	NH3-N	mg/L	41	0	10/19/2007	6/29/2009	0.05	0.83	0	0.16	0.13				
Project 77 Drain	Dry	NO2	mg/L	41	0	10/19/2007	6/29/2009	0.06	0.72	0	0.12	0.02				
Project 77 Drain	Dry	NO3	mg/L	41	0	10/19/2007	6/29/2009	0.37	2.48	1	0.86	0.85	0	45	Basin Plan	0.00
Project 77 Drain	Dry	Organic-N	mg/L	41	0	10/19/2007	6/29/2009	0.1	23.1	2	1.50	1.50				
Project 77 Drain	Dry	Ortho-Phosphorus	mg/L	41	0	10/19/2007	6/29/2009	0.1	1.15	0	0.35	0.35				
Project 77 Drain	Dry	TDS	mg/L	39	0	10/19/2007	6/29/2009	500	2980	715	628.00	628.00				
Project 77 Drain	Dry	Total Nitrogen	mg/L	41	0	10/19/2007	6/29/2009	0.88	25.89	3	2.60	2.60	40	1	TMDL	1.65
Project 77 Drain	Dry	Total Phosphate	mg/L	41	0	10/19/2007	6/29/2009	0.16	4.18	1	0.42	0.42				
Project 77 Drain	Dry	TSS	mg/L	40	0	10/19/2007	6/29/2009	1.6	181	12	4.00	4.00				
Project 77 Drain	Wet	Alkalinity	mg/L	6	0	11/30/2007	2/17/2009	28	124	83	88.00	88.00				
Project 77 Drain	Wet	Hardness	mg/L	6	0	11/30/2007	2/17/2009	30.4	264	147	130.50	130.50				
Project 77 Drain	Wet	Inorganic Nitrogen	mg/L	6	0	11/30/2007	2/17/2009	1.01	3.41	2	1.77	1.77				
Project 77 Drain	Wet	Kjeldhal-N	mg/L	6	0	11/30/2007	2/17/2009	0.74	2.83	2	2.61	2.61				
Project 77 Drain	Wet	NH3-N	mg/L	6	0	11/30/2007	2/17/2009	0.14	0.76	0	0.50	0.50				
Project 77 Drain	Wet	NO2	mg/L	6	0	11/30/2007	2/17/2009	0.1	0.56	0	0.14	0.06				
Project 77 Drain	Wet	NO3	mg/L	6	0	11/30/2007	2/17/2009	0.74	2.42	1	1.12	1.12	0	45	Basin Plan	0.00
Project 77 Drain	Wet	Organic-N	mg/L	6	0	11/30/2007	2/17/2009	0.6	2.3	2	1.95	1.95				
Project 77 Drain	Wet	Ortho-Phosphorus	mg/L	6	0	11/30/2007	2/17/2009	0.06	2.01	1	0.52	0.52				
Project 77 Drain	Wet	TDS	mg/L	6	0	11/30/2007	2/17/2009	92	620	386	378.00	378.00				
Project 77 Drain	Wet	Total Nitrogen	mg/L	6	0	11/30/2007	2/17/2009	1.77	5.71	4	3.92	3.92	6	1	TMDL	1.22
Project 77 Drain	Wet	Total Phosphate	mg/L	6	0	11/30/2007	2/17/2009	0.2	1.99	1	0.64	0.64				
Project 77 Drain	Wet	TSS	mg/L	6	0	11/30/2007	2/17/2009	3	311	93	31.50	31.50				
Wilmington Drain	Undefined	E. Coli	(MPN/100mL)	4	0	12/26/2007	2/27/2008	100	1400	450	150.00	150.00	1	235	Basin Plan	0.04
Wilmington Drain	Undefined	Ent.	(MPN/100mL)	4	0	12/26/2007	2/27/2008	10	1200	310	15.00	15.00				
Wilmington Drain	Undefined	Tot. Coli.	(MPN/100mL)	4	0	12/26/2007	2/27/2008	5400	19000	10,675	9,150.00	9,150.00				
Wilmington Drain	Dry	Alkalinity	mg/L	29	0	10/19/2007	2/2/2009	108	238	169	164.00	164.00				
Wilmington Drain	Dry	Hardness	mg/L	31	0	10/19/2007	6/15/2009	137	1000	554	573.00	573.00				
Wilmington Drain	Dry	Inorganic Nitrogen	mg/L	30	0	10/19/2007	2/2/2009	0.29	1.97	1	0.91	0.89				
Wilmington Drain	Dry	Kjeldhal-N	mg/L	30	0	10/19/2007	2/2/2009	0.85	16.33	2	1.91	1.91				
Wilmington Drain	Dry	NH3-N	mg/L	39	0	10/19/2007	2/2/2009	0.15	1.44	1	0.52	0.52				
Wilmington Drain	Dry	NO2	mg/L	30	0	10/19/2007	2/2/2009	0.05	0.35	0	0.12	0.02				
Wilmington Drain	Dry	NO3	mg/L	30	0	10/19/2007	2/2/2009	0.1	2.09	1	0.37	0.37	0	45	Basin Plan	0.00
Wilmington Drain	Dry	Organic-N	mg/L	30	0	10/19/2007	2/2/2009	0.6	15.4	2	1.30	1.30				
Wilmington Drain	Dry	Ortho-Phosphorus	mg/L	30	0	10/19/2007	2/2/2009	0.21	4.42	1	0.40	0.39				
Wilmington Drain	Dry	TDS	mg/L	29	0	10/19/2007	2/2/2009	580	1760	1,217	1,240.00	1,240.00				
Wilmington Drain	Dry	Total Nitrogen	mg/L	30	0	10/19/2007	2/2/2009	1.29	18.42	3	2.31	2.31	30	1	TMDL	1.29
Wilmington Drain	Dry	Total Phosphate	mg/L	30	0	10/19/2007	2/2/2009	0.11	4.66	1	0.51	0.51				
Wilmington Drain	Dry	TSS	mg/L	30	0	10/19/2007	2/2/2009	2	38	12	8.00	8.00				

Table E.5: Machado Lake - Water Quality Data Summary

Location	Weather	Constituent	Units	Total No. of Values	No. Values with ND	Dates Sampled		Min.	Max.	Avg.	Median		No. of Exceed.	Regulatory Threshold	Regulatory Source	Exceed. Frequency (# exceed. per year)
						From	To				w/o ND	w/ND				
Wilmington Drain	Wet	Alkalinity	mg/L	6	0	11/30/2007	2/17/2009	14	158	85	84.00	84.00				
Wilmington Drain	Wet	Hardness	mg/L	6	0	11/30/2007	2/17/2009	22.8	442	190	204.50	204.50				
Wilmington Drain	Wet	Inorganic Nitrogen	mg/L	6	0	11/30/2007	2/17/2009	0.61	1.67	1	1.35	1.35				
Wilmington Drain	Wet	Kjeldhal-N	mg/L	6	0	11/30/2007	2/17/2009	0.89	1.76	1	1.26	1.26				
Wilmington Drain	Wet	NH3-N	mg/L	7	0	11/30/2007	2/17/2009	0.16	0.86	0	0.50	0.50				
Wilmington Drain	Wet	NO2	mg/L	6	0	11/30/2007	2/17/2009	0.06	0.06	0	0.06	0.02				
Wilmington Drain	Wet	NO3	mg/L	6	0	11/30/2007	2/17/2009	0.45	1.17	1	0.85	0.85	0	45	Basin Plan	0.00
Wilmington Drain	Wet	Organic-N	mg/L	6	0	11/30/2007	2/17/2009	0.6	0.94	1	0.90	0.90				
Wilmington Drain	Wet	Ortho-Phosphorus	mg/L	6	0	11/30/2007	2/17/2009	0.07	0.9	0	0.45	0.45				
Wilmington Drain	Wet	TDS	mg/L	6	0	11/30/2007	2/17/2009	52	820	421	374.00	374.00				
Wilmington Drain	Wet	Total Nitrogen	mg/L	6	0	11/30/2007	2/17/2009	1.51	2.57	2	2.13	2.13	6	1	TMDL	1.22
Wilmington Drain	Wet	Total Phosphate	mg/L	6	0	11/30/2007	2/17/2009	0.13	0.93	0	0.50	0.50				
Wilmington Drain	Wet	TSS	mg/L	6	0	11/30/2007	2/17/2009	4	88	40	39.50	39.50				

Notes:
Water quality data available but no screening criteria was determined.
Source:
City of Los Angeles Department of Public Works Bureau of Sanitation
Watershed Protection Division - Pollutant Assessment Section
Machado Lake Nutrient TMDL Monitoring Program

Table E.6: Dominguez Channel - Ammonia Study Data Summary

Date	Sampling Site	Waterbody	Sample ID EMD	Sample ID WPD	MDL (mg/L)	ML (mg/L)	Total Ammonia Concentration (mg/L NH_3-N)	pH	Temperature (°C)	Unionized Ammonia (mg/L)	Weather	Basin Plan Amendment (2002, 2004) Criteria		Exceed.
												Total Ammonia (NH_3-N) (mg/L)	Unionized Ammonia (NH_3-N) (mg/L)	
7/1/2009	190th St. @ Figueroa St.	Estuary	HT132614-4	DC-E-190	0.05	0.1	ND	7.56	24.90		Dry			
7/8/2009	190th St. @ Figueroa St.	Estuary	HT132877-4	DC-E-190	0.05	0.1	ND	7.53	24.30		Dry			
7/15/2009	190th St. @ Figueroa St.	Estuary	HT133123-4	DC-E-190	0.05	0.1	ND	7.68	26.90		Dry			
7/22/2009	190th St. @ Figueroa St.	Estuary	HT133363-4	DC-E-190	0.05	0.1	ND	7.66	27.90		Dry			
7/29/2009	190th St. @ Figueroa St.	Estuary	HT133594-4	DC-E-190	0.05	0.1	0.23	7.61	26.80	0.006	Dry	1.783	0.029	No
8/5/2009	190th St. @ Figueroa St.	Estuary	HT133830-4	DC-E-190	0.05	0.1	ND	7.78	26.90		Dry			
8/13/2009	190th St. @ Figueroa St.	Estuary	HT134118-4	DC-E-190	0.05	0.1	ND	7.82	25.30		Dry			
7/1/2009	223rd St. @ Wilmington Ave.	Estuary	HT132614-3	DC-E-223	0.05	0.1	ND	7.65	24.10		Dry			
7/8/2009	223rd St. @ Wilmington Ave.	Estuary	HT132877-3	DC-E-223	0.05	0.1	ND	7.69	24.30		Dry			
7/15/2009	223rd St. @ Wilmington Ave.	Estuary	HT133123-3	DC-E-223	0.05	0.1	ND	7.81	25.30		Dry			
7/22/2009	223rd St. @ Wilmington Ave.	Estuary	HT133363-3	DC-E-223	0.05	0.1	ND	7.62	25.00		Dry			No
7/29/2009	223rd St. @ Wilmington Ave.	Estuary	HT133594-3	DC-E-223	0.05	0.1	0.16	7.73	26.00	0.005	Dry	1.650	0.029	
8/5/2009	223rd St. @ Wilmington Ave.	Estuary	HT133830-3	DC-E-223	0.05	0.1	ND	7.71	25.20		Dry			
8/13/2009	223rd St. @ Wilmington Ave.	Estuary	HT134118-3	DC-E-223	0.05	0.1	ND	7.84	24.50		Dry			
7/1/2009	Henry Ford Ave.	Estuary	HT132614-1	DC-E-HFD	0.05	0.1	ND	7.60	25.30		Dry			
7/8/2009	Henry Ford Ave.	Estuary	HT132877-1	DC-E-HFD	0.05	0.1	ND	7.72	24.30		Dry			
7/15/2009	Henry Ford Ave.	Estuary	HT133123-1	DC-E-HFD	0.05	0.1	ND	7.74	25.10		Dry			
7/22/2009	Henry Ford Ave.	Estuary	HT133363-1	DC-E-HFD	0.05	0.1	ND	7.76	25.30		Dry			
7/29/2009	Henry Ford Ave.	Estuary	HT133594-1	DC-E-HFD	0.05	0.1	0.16	7.75	21.00	0.004	Dry	2.225	0.029	No
8/5/2009	Henry Ford Ave.	Estuary	HT133830-1	DC-E-HFD	0.05	0.1	ND	7.75	21.90		Dry			
8/13/2009	Henry Ford Ave.	Estuary	HT134118-1	DC-E-HFD	0.05	0.1	ND	7.74	25.50		Dry			
7/1/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT132614-2	DC-E-SPV	0.05	0.1	ND	7.63	23.30		Dry			
7/8/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT132877-2	DC-E-SPV	0.05	0.1	ND	7.71	24.30		Dry			
7/15/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT133123-2	DC-E-SPV	0.05	0.1	ND	7.75	24.90		Dry			
7/22/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT133363-2	DC-E-SPV	0.05	0.1	ND	7.73	25.40		Dry			
7/29/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT133594-2	DC-E-SPV	0.05	0.1	0.16	7.62	24.50	0.004	Dry	2.047	0.288	No
8/5/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT133830-2	DC-E-SPV	0.05	0.1	ND	7.69	22.40		Dry			
8/13/2009	Sepulveda Blvd. @ Alameda St.	Estuary	HT134118-2	DC-E-SPV	0.05	0.1	ND	7.76	23.60		Dry			
7/1/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT132614-6	DC-F-ART	0.05	0.1	ND	8.77	24.30		Dry			
7/8/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT132877-6	DC-F-ART	0.05	0.1	DNQ (0.08)	8.42	24.30		Dry			
7/15/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT133123-6	DC-F-ART	0.05	0.1	ND	8.56	29.50		Dry			
7/22/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT133363-6	DC-F-ART	0.05	0.1	ND	9.04	31.20		Dry			
7/29/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT133594-6	DC-F-ART	0.05	0.1	0.12	8.81	25.50	0.033	Dry	0.320	-	No
8/5/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT133830-6	DC-F-ART	0.05	0.1	ND	9.16	29.40		Dry			
8/13/2009	Artesia Blvd. @ Western Ave.	Freshwater	HT134118-6	DC-F-ART	0.05	0.1	ND	9.01	26.80		Dry			
7/1/2009	El Segundo Blvd.	Freshwater	HT132614-8	DC-F-ELS	0.05	0.1	ND	9.76	24.30		Dry			
7/8/2009	El Segundo Blvd.	Freshwater	HT132877-8	DC-F-ELS	0.05	0.1	ND	9.88	24.70		Dry			
7/15/2009	El Segundo Blvd.	Freshwater	HT133123-8	DC-F-ELS	0.05	0.1	ND	10.12	32.00		Dry			
7/22/2009	El Segundo Blvd.	Freshwater	HT133363-8	DC-F-ELS	0.05	0.1	ND	8.99	31.50		Dry			
7/29/2009	El Segundo Blvd.	Freshwater	HT133594-8	DC-F-ELS	0.05	0.1	0.18	10.14	30.00	0.165	Dry	0.070	-	Yes
8/5/2009	El Segundo Blvd.	Freshwater	HT133830-8	DC-F-ELS	0.05	0.1	ND	9.57	30.70		Dry			
8/13/2009	El Segundo Blvd.	Freshwater	HT134118-8	DC-F-ELS	0.05	0.1	ND	9.69	27.80		Dry			
7/1/2009	Manhattan Beach Blvd.	Freshwater	HT132614-7	DC-F-MAN	0.05	0.1	ND	8.84	24.30		Dry			
7/8/2009	Manhattan Beach Blvd.	Freshwater	HT132877-7	DC-F-MAN	0.05	0.1	ND	8.60	24.50		Dry			
7/15/2009	Manhattan Beach Blvd.	Freshwater	HT133123-7	DC-F-MAN	0.05	0.1	ND	8.62	25.70		Dry			
7/22/2009	Manhattan Beach Blvd.	Freshwater	HT133363-7	DC-F-MAN	0.05	0.1	ND	8.79	26.90		Dry			
7/29/2009	Manhattan Beach Blvd.	Freshwater	HT133594-7	DC-F-MAN	0.05	0.1	1.50	8.93	26.00	0.513	Dry	0.257	-	Yes
8/5/2009	Manhattan Beach Blvd.	Freshwater	HT133830-7	DC-F-MAN	0.05	0.1	ND	8.41	25.40		Dry			
8/13/2009	Manhattan Beach Blvd.	Freshwater	HT134118-7	DC-F-MAN	0.05	0.1	ND	8.48	24.60		Dry			
7/1/2009	Vermont Ave.	Freshwater	HT132614-5	DC-F-VER	0.05	0.1	ND	8.71	24.30		Dry			
7/8/2009	Vermont Ave.	Freshwater	HT132877-5	DC-F-VER	0.05	0.1	ND	8.57	24.40		Dry			
7/15/2009	Vermont Ave.	Freshwater	HT133123-5	DC-F-VER	0.05	0.1	ND	8.89	29.50		Dry			
7/22/2009	Vermont Ave.	Freshwater	HT133363-5	DC-F-VER	0.05	0.1	0.15	7.96	28.70	0.009	Dry	1.033	-	No
7/29/2009	Vermont Ave.	Freshwater	HT133594-5	DC-F-VER	0.05	0.1	0.17	8.70	25.10	0.038	Dry	0.3933	-	No
8/5/2009	Vermont Ave.	Freshwater	HT133830-5	DC-F-VER	0.05	0.1	ND	8.69	27.40		Dry			
8/13/2009	Vermont Ave.	Freshwater	HT134118-5	DC-F-VER	0.05	0.1	ND	8.91	26.50		Dry			

Notes:
MDL = Method Detection Limit (the concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136 Appendix B).

Table E.6: Dominguez Channel - Ammonia Study Data Summary

Date	Sampling Site	Waterbody	Sample ID EMD	Sample ID WPD	MDL (mg/L)	ML (mg/L)	Total Ammonia Concentration (mg/L NH_3-N)	pH	Temperature (°C)	Unionized Ammonia (mg/L)	Weather	Basin Plan Amendment (2002, 2004) Criteria		Exceed.
												Total Ammonia (NH_3-N) (mg/L)	Unionized Ammonia (NH_3-N) (mg/L)	

ML = Minimum Level (the concentration of a substance equivalent to the lowest calibration standard).
ND = Not Detected (concentration below MDL).
DNQ = Detected, NOT Quantified (concentration falls below the ML, but above the MDL). Estimated values shown in parentheses.
AE = Analysis Error (no value to report)
pH/Temperature were measured using a temperature-compensated pH probe, calibrated daily prior to use.
Source:
City of Los Angeles, Department of Public Works, Bureau of Sanitation, Watershed Protection Division, Pollution Assessment Section
Special Ammonia Sampling at Dominguez Channel
4 Freshwater, 4 Estuary Stations

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Water and sediment quality monitoring reports were collected and reviewed as part of the characterization. These reports are summarized in Table E.7.

Table E.7: Monitoring Reports Reviewed for Water Quality Characterization

Source	Water Body(ies)	Date Range
LACDPW NPDES MS4 Stormwater Monitoring Reports	Dominguez Channel Mass Emission Station	2002-2012
	Dominguez Channel Tributary Monitoring	2008-2011
Surface Water Ambient Monitoring Program (SWAMP)	Dominguez Channel, Machado Lake and LA/LB Harbor	2003
Dominguez Channel/Consolidated Slip Erosion Study	Dominguez Channel Estuary and Consolidated Slip	2011
Southern California Bight Regional Monitoring Program	LA/LB Harbor	2003 2008
POLA water data	Inner, Fish, and Outer Harbor	2005
Port of Long Beach (POLB) water data	Inner Harbor	2006
POLA/POLB Sediment Survey	Inner and Outer Harbor	2006
City of LA Terminal Island Water Reclamation Plant Biennial Assessment Report	Outer Harbor	2002/2003 2008/2009 2010/2011
Southern California Coastal Water Research Project (SCCWRP) DDE Inventory	Inner and Outer Harbor	2003
Consolidated Slip Restoration Project Concept Plan Supplemental Report	Dominguez Channel, Dominguez Channel Estuary, Torrance Lateral, and Consolidated Slip	2002
SCCWRP Atmospheric Deposition in LA/LB Harbor study	Consolidated Slip	2006
Wilmington Drain Sediment Characterization Study - LACDPW and City of Los Angeles Bureau of Engineering (BOE)	Wilmington Drain	2007
City of LA Machado Lake Nutrients and Toxics TMDL Lake Water Quality Management Plan	Machado Lake and Wilmington Drain	2001-2009

Tables of the observed exceedances over the monitoring period and exceedances over the past five years (starting in January 2008) are summarized in Table E.9 through Table E.13 below. The last ten years of data was identified and evaluated based on the requirements specified in the Reasonable Assurance Analysis (RAA) Guidelines as defined in the EWMP Work Plan and the most recent five years of data was focused on, as it is the most relevant. Note that metals were evaluated in dissolved form.

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Table E.8: Summary of Exceedances for the Dominguez Channel Monitoring Locations

				Mainstream of Dominguez Channel								Tributaries			
				El Segundo Blvd		Mass Emission Station, S-28 (Artesia Blvd)		Western Ave		Vermont Ave		Yukon Ave		Carson Plaza Dr	
		Date Range		Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years
Constituent	**Weather**	**From**	**To**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**
Copper[A]	Wet	7/25/02	2/22/07	5/11	-	21/39	12/20	4/11	-	1/4	-	3/4	-	1/4	-
	Dry	4/26/01	5/26/09	35/83	2/16	7/33	5/22	16/82	0/16	7/47	0/16	14/45	3/15	9/36	0/8
Lead[A]	Wet	7/25/02	2/22/07	2/11	-	5/34	5/20	3/11	-	1/3	-	1/4	-	1/4	-
	Dry	4/26/01	5/26/09	8/81	1/16	1/30	1/22	2/81	1/16	1/47	1/16	2/46	1/15	0/36	0/8
Zinc[A]	Wet	7/25/02	2/22/07	3/11	-	18/39	11/20	2/11	-	0/4	-	1/4	-	0/4	-
	Dry	4/26/01	5/26/09	0/82	0/16	2/33	2/22	0/82	0/16	0/47	0/16	1/42	0/15	0/36	0/8
Cadmium	Wet	7/25/02	2/22/07	1/11	-	-	-	0/11	-	0/4	-	0/4	-	0/4	-
	Dry	4/26/01	5/26/09	0/82	0/16	-	-	1/82	0/16	0/47	0/16	0/46	0/15	0/36	0/8
Chromium	Dry	4/26/01	5/26/09	1/83	0/16	-	-	0/83	0/16	1/47	1/16	2/46	0/15	0/36	0/8
Mercury	Wet	7/25/02	8/25/05	2/10	-	0/37	0/20	2/10	-	0/3	-	0/3	-	0/3	-
	Dry	4/26/01	2/24/06	8/46	-	1/65	0/22	7/46	-	0/11	-	0/11	-	0/9	-
Thallium	Dry	3/31/05	2/24/06	2/47	-	-	-	1/47	-	0/11	-	0/11	-	0/9	-
Selenium	Dry	5/31/01	5/26/09	0/82	0/17	-	-	0/82	0/17	0/48	0/17	0/47	0/16	7/37	7/9
E. coli[B]	Wet	11/29/01	12/23/08	24/38	22/34	4/4	4/4	29/38	6/6	19/38	5/6	10/12	1/2	9/12	1/2
	Dry	4/3/01	5/26/09	120/250	5/6	5/5	5/5	194/250	27/34	113/250	30/34	41/71	9/15	48/77	6/15
Fecal Coliform	Wet	11/8/02	1/24/13	-	-	44/46	21/21	-	-	-	-	-	-	-	-
	Dry	10/10/02	4/9/13	-	-	19/27	12/18	-	-	-	-	-	-	-	-
Ammonia	Dry	7/1/09	8/13/09	1/7	1/7	-	-	0/7	0/7	0/7	0/7	-	-	-	-

Table E.8: Summary of Exceedances for the Dominguez Channel Monitoring Locations

				Mainstream of Dominguez Channel								Tributaries			
				El Segundo Blvd		Mass Emission Station, S-28 (Artesia Blvd)		Western Ave		Vermont Ave		Yukon Ave		Carson Plaza Dr	
		Date Range		Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years	Overall	Past 5 Years
Constituent	**Weather**	**From**	**To**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**
Diazinon	Wet	10/31/06	6/12/13	-	-	3/31	0/20	-	-	-	-	-	-	-	-
	Dry	2/11/03	1/24/13	-	-	0/28	0/22	-	-	-	-	-	-	-	-
Bis(2-Ethylhexl) phthalate	Wet	10/28/03	6/12/13	-	-	3/31	0/21	-	-	-	-	-	-	-	-
	Dry	10/31/03	1/24/13	-	-	1/30	0/23	-	-	-	-	-	-	-	-
pH	Wet	11/8/02	1/24/13	-	-	5/39	3/20	-	-	-	-	-	-	-	-
	Dry	10/10/02	6/12/13	-	-	9/33	8/22	-	-	-	-	-	-	-	-
Dissolved Oxygen	Wet	11/8/2002	1/24/2013	-	-	1/42	0/18	-	-	-	-	-	-	-	-

E/N = Number of Exceedances/Number of Samples
- = No Data
[A] Copper, Lead, and Zinc measurements for Sampling Station S-28 were taken on the following dates: 2/27/2006 - 1/24/2013 (wet) and 5/16/2005-6/12/2013 (dry)
[B] E. Coli at Sampling Station S-28 was taken on the following dates: 10/11/2012 - 1/24/2013 (wet) and 10/10/2012-4/9/2013 (dry)

Table E.9: Summary of Exceedances at the Torrance Lateral Monitoring Location					
				Main Street	
		Date Range		**Overall**	**Past 5 Years**
Constituent	**Weather**	**From**	**To**	**E/N**	**E/N**
	Wet	4/28/2005	2/22/2007	1/4	-
	Dry	1/27/2005	5/26/2009	7/47	1/16
Lead	Wet	4/28/2005	2/22/2007	1/3	-
	Dry	1/27/2005	5/26/2009	1/47	1/16
Zinc	Wet	4/28/2005	2/22/2007	1/4	-
Cadmium	Wet	4/28/2005	2/22/2007	1/4	-
	Dry	1/27/2005	5/26/2009	1/47	0/16
E. coli	Wet	2/27/2003	12/23/2008	7/12	2/2
	Dry	1/17/2002	5/26/2009	42/77	13/15

E/N = Number of Exceedances/Number of Samples
- = No Data

Table E.10: Summary of Exceedances for the Dominguez Channel Estuary Monitoring Locations							
				Wilmington Avenue		**Henry Ford Avenue**	
		Date Range		**Overall**	**Past 5 Years**	**Overall**	**Past 5 Years**
Constituent	**Weather**	**From**	**To**	**E/N**	**E/N**	**E/N**	**E/N**
Copper	Wet	7/25/2002	2/22/2007	10/11	-	5/10	-
	Dry	4/26/2001	5/26/2009	44/72	10/10	43/73	9/10
Lead	Wet	7/25/2002	2/22/2007	0/11	-	2/11	-
	Dry	4/26/2001	5/26/2009	12/72	1/9	14/75	1/10
Zinc	Wet	7/25/2002	2/22/2007	2/10	-	1/11	-
	Dry	4/26/2001	5/26/2009	4/75	2/10	0/74	0/10
Silver	Dry	4/26/2001	5/26/2009	1/75	0/9	3/74	0/9
Nickel	Wet	7/25/2002	2/22/2007	1/11	-	1/11	-
	Dry	4/26/2001	5/26/2009	16/75	6/10	16/75	6/10
Mercury	Dry	4/26/2001	2/24/2006	10/46	-	8/45	-

Thallium	Wet	7/25/2002	8/25/2005	1/10	-	1/9	-
	Dry	4/26/2001	1/26/2006	4/47	-	4/46	-
Enterococcus	Wet	11/29/2001	12/23/2008	28/38	5/6	21/38	3/6
	Dry	4/3/2001	5/26/2009	31/250	4/34	12/250	0/34
Total Coliform	Wet	11/29/2001	12/23/2008	33/38	5/6	26/38	4/6
	Dry	4/3/2001	5/26/2009	57/250	5/34	11/250	2/34

E/N = Number of Exceedances/Number of Samples
- = No Data

Table E.11: Summary of Exceedances for the Machado Lake Monitoring Locations															
				Machado Lake, ML-1		**Machado Lake, ML-2**		**Machado Lake, ML-3**		**Machado Lake, ML-4**		**Project 77 Drain**		**Project 510 Drain**	
		Date Range		**Overall**	**Past 5 Years**	**Overall**	**Past 5 Years**	**Overall**	**Past 5 Years**	**Overall**	**Past 5 Years**	**Overall**	**Past 5 Years**	**Overall**	**Past 5 Years**
Constituent	**Weather**	**From**	**To**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**	**E/N**
E.Coli	Wet	12/20/07	12/20/07	1/1	-	1/1	-	1/1	-	-	-	-	-	-	-
	Dry	12/26/07	9/29/08	24/54	24/54	18/55	17/54	43/55	43/54	8/47	8/47	2/4	1/3	0/1	-
Total Phosphorus	Wet	5/23/08	2/17/09	1/2	1/1	1/1	1/1	-	-	-	-	-	-	-	-
	Dry	5/19/08	2/7/11	43/52	45/45	45/45	45/45	-	-	-	-	-	-	-	-
Total Nitrogen	Wet	4/17/07	2/17/09	5/6	3/4	4/5	3/4	1/1	1/1	1/1	1/1	6/6	3/3	1/1	-
	Dry	6/16/06	2/7/11	89/106	70/87	92/106	74/87	45/47	45/47	44/47	44/47	40/41	31/32	29/31	22/22
Chlorophyll-a	Wet	5/23/08	2/17/09	1/2	1/2	1/2	1/2	1/1	1/1	1/1	1/1	-	-	-	-
	Dry	5/19/08	2/7/11	43/55	43/55	46/55	46/55	20/20	20/20	19/19	19/19	-	-	-	-
Dissolved Oxygen	Wet	12/26/12	12/26/12	1/1	1/1	1/1	1/1	-	-	-	-	-	-	-	-
	Dry	4/4/11	12/10/12	37/45	37/45	41/45	41/45	-	-	-	-	-	-	-	-

E/N = Number of Exceedances/Number of Samples
- = No Data

Table E.12: Summary of Exceedances at the Wilmington Drain Monitoring Location					
				Wilmington Drain	
		Date Range		**Overall**	**Past 5 Years**
Constituent	**Weather**	**From**	**To**	**E/N**	**E/N**
E. Coli	Dry	12/26/2007	2/27/2008	1/4	0/3
Total Nitrogen	Wet	11/30/2007	2/17/2009	6/6	3/3
	Dry	10/19/2007	2/2/2009	30/30	21/21

E/N = Number of Exceedances/Number of Samples
- = No Data

The data analysis and results from monitoring reports were used to classify WBPCs into the subcategories of MS4 Permit Categories. A description of those subcategories is presented in Table E.14.

Table E.13: Categorized Water Body-Pollutant Combinations

Category	Water Body-Pollutant Combinations	Description
1	**Category 1A:** WBPCs with past due or current Permit term TMDL deadlines with exceedances in the past 5 years.	WBPCs with TMDLs with past due or current MS4 Permit term interim and/or final limits. These pollutants are the highest priority for the current MS4 Permit term.
	Category 1B: WBPCs with TMDL deadlines beyond the Permit term with exceedances in the past 5 years.	The MS4 Permit does not require the prioritization of TMDL interim and/or final deadlines outside of the Permit term or USEPA TMDLs, which do not have implementation schedules. To ensure EWMPs consider long term planning requirements and utilize the available compliance mechanisms, these WBPCs should be considered during BMP planning and scheduling, and during CIMP development.
	Category 1C: WBPCs addressed in USEPA TMDL without a Regional Board adopted Implementation Plan.	
	Category 1D: WBPCs with past due or current Permit term TMDL deadlines but have there have been no exceedances in the past 5 years.	WBPCs where specific actions may end up not being identified because recent exceedances have not been observed and specific actions may not be necessary. The CIMP should address these WBPCs to support future re-prioritization.
2	**Category 2A:** 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements with exceedances in the past 5 years.	WBPCs with confirmed impairment or exceedances of RWLs. WBPCs in a similar class[1] as those with TMDLs are identified. WBPCs currently on the 303(d) List are differentiated from those that are not to support utilization of EWMP compliance mechanisms.
	Category 2B: 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements that are not a "pollutant"2 (e.g., toxicity).	WBPCs where specific actions may not be identifiable because the cause of the impairment or exceedances is not resolved. Either routine monitoring or special studies identified in the CIMP should support identification of a "pollutant" linked to the impairment and re-prioritization in the future.
	Category 2C: 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements but there have been no exceedances in the past 5 years.	WBPCs where specific actions for implementation may end up not being identified because recent exceedances have not been observed (and thus specific BMPs may not be necessary). Pollutants that are in a similar class[1] as those with TMDLs are identified. Either routine monitoring or special studies identified in the CIMP should ensure these WBPCs are addressed to support re-prioritization in the future.
3	**Category 3A:** Other WBPCs that have exceeded in the past 5 years.	Pollutants that are in a similar class[1] as those with TMDLs are identified.
	Category 3B: Other WBPCs that are not a "pollutant"2 (e.g., toxicity).	WBPCs where specific actions may not be identifiable because the cause of the impairment or exceedances is not resolved. Either routine monitoring or special

Table E.13: Categorized Water Body-Pollutant Combinations		
Category	**Water Body-Pollutant Combinations**	**Description**
		studies identified in the CIMP should support identification of a "pollutant" linked to the impairment and re-prioritization in the future.
	Category 3C: Other WBPCs that have exceeded in the past 10 years, but not in past 5 years.	Pollutants that are in a similar class[1] as those with TMDLs are identified.
	Category 3D: WBPCs identified by the DC WMG.	No other WBPCs were identified for consideration in EWMP planning.

Those pollutants with similar fate and transport mechanisms that can be addressed with the same types of control measures were also grouped into classes. These classes include:

- Bacteria
- Metals
- Nutrients
- Trash
- Historical Organics (HO) – organic compounds including pesticides that are no longer in use such as PCBs and DDT
- Current Organics (CO) – organic Compounds such as pesticides and PAHs that are still in use
- To be determined (TBD) – conditions such as pH, dissolved oxygen, and toxicity that are not classified as pollutants and will need further investigation before grouping into other classes

The tables below lists the subcategorized WBPCs for DC WMG (Table E.15), Torrance Lateral (Table E.16), Dominguez Channel Estuary (Table E.17), Machado Lake (Table E.18), Wilmington Drain (Table E.19), the Consolidated Slip (Table E.20), and the rest of the Los Angeles Harbor areas (Table E.21). Those designations that only apply to a specific weather condition (wet or dry) were marked as such. Refer to Table for a description of the subcategories. Subcategorizations may change as more recent monitoring data becomes available for evaluation.

Table E.14: Summary of Dominguez Channel1 Subcategorized WBPCs

Class	Constituents[2]	Subcategory
Metal	Dissolved Copper (Wet)	1A
Metal	Dissolved Lead (Wet)	1A
Metal	Dissolved Zinc (Wet)	1A
TBD	Toxicity	1D
Bacteria	Indicator Bacteria	2A
Nutrients	Ammonia (Dry)	2A
HO	Diazinon	2C
Metals	Dissolved Copper (Dry)	3A
Metals	Dissolved Lead (Dry)	3A
Metals	Dissolved Zinc (Dry)	3A
Metals	Dissolved Chromium (Dry)	3A
TBD	Cyanide	3A
TBD	pH	3B
Metals	Dissolved Cadmium	3C
Metals	Dissolved Mercury	3C
Metals	Dissolved Thallium (Dry)	3C
CO	Bis (2-Ethylhexl) phthalate	3C
TBD	Dissolved Oxygen	3C

1 Dominguez Channel refers to lined portion above Vermont Avenue.
2 If the constituent is noted as wet or dry, then the priority is only based on wet- or dry-weather.
UT = Unknown Toxicity
HO = Historical Organics
CO = Current Organics

Table E.15: Summary of Torrance Lateral Subcategorized WBPCs		
Class	**Constituents[1]**	**Subcategory**
Metal	Dissolved Copper (Wet)	1A
Metal	Dissolved Lead (Wet)	1A
Metal	Dissolved Zinc (Wet)	1A
Bacteria	Coliform Bacteria	2A
Metals	Dissolved Copper (Dry)	3A
Metals	Dissolved Lead (Dry)	3A
TBD	Cyanide	3A
TBD	pH	3A
Nutrients	Ammonia (Dry)	3A
Metals	Dissolved Zinc (Dry)	3C
Metals	Dissolved Cadmium	3C
HO	DDT	3C
HO	PCBs	3C

[1] If the constituent is noted as wet or dry, then the priority is only based on wet- or dry-weather.
UT = Unknown Toxicity
HO = Historical Organics

Table E.16: Summary of Dominguez Channel Estuary Subcategorized WBPCs		
Class	**Constituents[1]**	**Subcategory**
Metals	Cadmium (Sediment)	1A
Metals	Copper (Dissolved and Sediment)	1A
Metals	Lead (Dissolved and Sediment)	1A
Metals	Zinc (Dissolved and Sediment)	1A
HO	DDT (Sediment)	1A
HO	PCBs (Sediment)	1A
HO	Chlordane (Sediment)	1A
HO	Dieldrin (Sediment)	1A
CO	PAHs (Sediment)	1A
TBD	Benthic Community Effects	1D
TBD	Sediment Toxicity	1D
Bacteria	Coliform Bacteria	2A
Nutrients	Ammonia (Dry)	2C
Metals	Arsenic (Sediment)	3A
Metals	Chromium (Sediment)	3A
Metals	Mercury (Sediment)	3A
Metals	Silver (Sediment)	3A
Metals	Dissolved Silver (Dry)	3C
Metals	Dissolved Nickel	3C
Metals	Dissolved Mercury (Dry)	3C
Metals	Thallium (Dissolved)	3C

[1] If the constituent is noted as wet or dry, then the priority is only based on wet- or dry-weather.
UT = Unknown Toxicity

Table E.16: Summary of Dominguez Channel Estuary Subcategorized WBPCs		
Class	**Constituents[1]**	**Subcategory**

HO = Historical Organics
CO = Current Organics

Table E.17: Summary of Machado Lake Subcategorized WBPCs		
Class	**Constituents[1]**	**Subcategory**
Trash	Trash	1A
Nutrients	Total Phosphorus	1A
Nutrients	Total Nitrogen	1A
TBD	Dissolved Oxygen	1A
Nutrients	Chlorophyll-a	1A
HO	PCBs (Sediment)	1B
HO	DDT (Sediment)	1B
HO	Chlordane (Sediment)	1B
HO	Dieldrin (Sediment)	1D
Nutrients	Ammonia	1D
Bacteria	E. coli (Dry)	3A
TBD	pH	3C

[1] If the constituent is noted as wet or dry, then the priority is only based on wet- or dry-weather.
UT = Unknown Toxicity HO = Historical Organics

Table E.18: Summary of Wilmington Drain Subcategorized WBPCs		
Class	**Constituents**	**Subcategory**
Bacteria	Coliform Bacteria	2C
Metals	Dissolved Copper	2C
Metals	Dissolved Lead	2C
Nutrients	Total Nitrogen	3A
HO	DDT (Sediment)	3A
HO	Chlordane (Sediment)	3A
HO	Dieldrin (Sediment)	3A
HO	PCBs (Sediment)	3C

HO = Historical Organics

Table E.19: Summary of Consolidated Slip Subcategorized WBPCs		
Class	**Constituents**	**Subcategory**
Metals	Cadmium (Sediment)	1A
Metals	Chromium (Sediment)	1A
Metals	Copper (Sediment)	1A
Metals	Lead (Sediment)	1A
Metals	Mercury (Sediment)	1A
Metals	Zinc (Sediment)	1A
HO	DDT (Sediment)	1A
HO	PCBs (Sediment)	1A

Table E.19: Summary of Consolidated Slip Subcategorized WBPCs		
Class	**Constituents**	**Subcategory**
CO	PAHs (Sediment)	1A
HO	Chlordane (Sediment)	1A
HO	Dieldrin (Sediment)	1A
HO	Toxaphene (Sediment)	1D
TBD	Benthic Community Effects	1D
TBD	Sediment Toxicity	1D
Metals	Silver (Sediment)	3A
Metals	Arsenic (Sediment)	3A
Metals	Nickel (Sediment)	3A

UT = Unknown Toxicity
HO = Historical Organics
CO = Current Organics

Table E.20: Summary of Other Los Angeles Harbor Subcategorized WBPCs		
Class	**Constituents**	**Subcategory**
Fish Harbor		
Metals	Copper (Sediment)	1D
Metals	Lead (Sediment)	1D
Metals	Mercury (Sediment)	1D
Metals	Zinc (Sediment)	1D
HO	DDT (Sediment & Tissue)	1D
HO	PCBs (Sediment & Tissue)	1D
HO	Chlordane (Sediment)	1D
CO	PAHs (Sediment)	1D
TBD	Sediment Toxicity	1D
Inner Cabrillo Beach		
Bacteria	Indicator Bacteria	1A
HO	DDT (Sediment & Tissue)	1D
HO	PCBs (Sediment & Tissue)	1D
Cabrillo Marina		
HO	DDT (Sediment & Tissue)	1D
HO	PCBs (Sediment & Tissue)	1D
CO	PAHs (Sediment)	1D
Los Angeles/Long Beach Inner Harbor		
Bacteria	Indicator Bacteria	1D
Metals	Copper (Sediment)	1D
Metals	Zinc (Sediment)	1D
HO	DDT (Sediment & Tissue)	1D
HO	PCBs (Sediment & Tissue)	1D
CO	PAHs (Sediment)	1D
TBD	Benthic Community Effects	1D

Table E.20: Summary of Other Los Angeles Harbor Subcategorized WBPCs		
Class	**Constituents**	**Subcategory**
TBD	Sediment Toxicity	1D
Metals	Dissolved Copper	3C
Metals	Dissolved Silver	3C
Los Angeles/Long Beach Outer Harbor		
HO	DDT (Sediment & Tissue)	1A
HO	PCBs (Sediment & Tissue)	1A
TBD	Sediment Toxicity	1D
Metals	Cadmium (Sediment)	3A
Metals	Copper (Sediment)	3A
Metals	Nickel (Sediment)	3A
Metals	Mercury (Sediment)	3C
Metals	Dissolved Copper	3C
Metals	Dissolved Silver	3C

UT = Unknown Toxicity
HO = Historical Organics
CO = Current Organics

Sediment toxicity and benthic community effects are classified as not showing exceedances in the past five years, potentially due to the fact that few samples have been collected in the last 5 years. The POLA and POLB are currently conducting bioaccumulation modeling and studies, fish tissue studies, and additional sediment triad studies to ascertain observed effects associated with elevated sediment concentrations of toxic compounds in the Harbor. These WBPCs can be reclassified when more recent data becomes available.

Per Part VI.C.2.a.iii (pages 51-52), pollutants for which there are exceedances of receiving water limitations, but which the water body is not identified as impaired on the 303(d) List will be addressed in the EWMP process. For most of the watershed, the most critical requirements are associated with the DC and LA Harbor Waters Toxic Pollutants TMDL as well as the Machado Lake Nutrients and Machado Lake Toxics TMDLs.

In addition to addressing the TMDL pollutants, the DC WMG will also address the requirements set forth by the MS4 Permit in regards to Category 2 and 3 pollutants. Pursuant to the MS4 Permit, Parts VI.C.2.a.ii.(5) (pages 50-51) and VI.C.2.a.iii.(2).(d) (page 52), interim and final milestones for WBPCs identified as Category 2 or 3 in Section 2 will be established.

Compliance schedules for the water bodies within the DC WMA are presented in Table E.21 through Table E.26.

Table E.21: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Dominguez Channel

	Date	Receiving Water Quality Objectives
Constituents Addressed in a TMDL		
Metals (Total Copper (Wet), Total Lead (Wet), Total Zinc (Wet)) and Toxicity		
Milestone 1	3/23/2026	50% reduction from baseline[1]
Milestone 2	3/23/2029	75% reduction from baseline[1]
Milestone 3	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs for wet weather metals and toxicity	3/23/2032	Total Recoverable Metals Freshwater Targets: Copper (Wet)[2] = 9.7 ug/L; Lead (Wet)[2] = 42.7 ug/L; Zinc (Wet)[2] = 69.6 ug/L Toxicity = 1.0 Tuc
Constituents on the 2010 303(d) list, but not Addressed in a TMDL		
Indicator Bacteria		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data and Determine if TMDL Development is Necessary	3/23/2017	
Meet Water Quality Objectives (Dry)	3/23/2032	Single Sample Limits: *E. coli* = 235/100 mL
Meet Water Quality Objectives (Wet)	3/23/2040	Single Sample Limits: *E. coli* = 235/100 mL
Ammonia		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data to support recommended delisting	3/23/2017	Dry = 30-day average pH and temperature dependent[3] water quality objective for Ammonia as N Wet = One-hour average pH and temperature dependent[3] water quality objective for Ammonia as N
Diazinon		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data to support recommended delisting	3/23/2017	Dry (chronic) = 0.05 ug/L; Wet (acute) = 0.08 ug/L
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Metals (Total Copper (Dry), Total Lead (Dry), Total Zinc (Dry), Total Cadmium, Chromium (Dry), Mercury, Thallium (Dry))		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets: Total Recoverable Metals Freshwater Targets: Copper (Dry)[4] = 19.71 ug/L; Lead (Dry)[4] = 9.70 ug/L; Zinc (Dry)[4] = 251.58 ug/L; Cadmium (Dry)[4] = 4.90 ug/L; Cadmium (Wet)[4] = 2.07 ug/L; Chromium (Dry) = 11 ug/L; Mercury 0.051 ug/L; Thallium (Dry) = 6.3 ug/L
Cyanide		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data	3/23/2017	Cyanide (Wet) = 22 ug/L; Cyanide (Dry) = 5.2 ug/L
Bis(2-Ethylhexel) phthalate		

Table E.21: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Dominguez Channel		
	Date	**Receiving Water Quality Objectives**
Conduct Monitoring through CIMP to confirm exceedances	Ongoing	
Evaluate Monitoring Data	3/23/2017	1.8 ug/L
pH		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data	3/23/2017	6.5 < pH < 8.5
Dissolved Oxygen		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data	3/23/2017	Dissolved Oxygen > 5mg/L

(1) Baseline will be identified during the Reasonable Assurance Analysis Process.
(2) Acute total recoverable metals freshwater targets shown using the site specific conversion factors listed in the Dominguez Channel Toxics TMDL. Factors utilize a hardness of 50 mg/L. Dissolved metals CTR criteria at the equivalent hardness are as follows: Copper (Wet) = 6.99 ug/L; Lead (Wet) = 30.14 ug/L; Zinc (Wet) = 65.13 ug/L.
(3) Ambient pH and temperature measurements will be taken at the time of sampling to determine the applicable receiving water quality target.
(4) A hardness of 50 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 240 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.
(5) The Dominguez Channel Estuary Water Quality Objectives are assuming saltwater conditions.
(6) A hardness of 205 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 570 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.

Table E.22: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Torrance Lateral

	Date	Receiving Water Quality Objectives
Constituents Addressed in a TMDL		
Metals (Total Copper (Wet), Total Lead (Wet), Total Zinc (Wet))		
Milestone 1	3/23/2026	50% reduction from baseline[1]
Milestone 2	3/23/2029	75% reduction from baseline[1]
Milestone 3	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs for wet weather metals and toxicity	3/23/2032	Total Recoverable Metals Freshwater Targets: Copper (Wet)[2] = 9.7 ug/L; Lead (Wet)[2] = 42.7 ug/L; Zinc (Wet)[2] = 69.6 ug/L
Constituents on the 2010 303(d) list, but not Addressed in a TMDL		
Coliform Bacteria		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data and Determine if TMDL Development is Necessary	3/23/2017	
Meet Water Quality Objectives (Dry)	3/23/2040	Single Sample Limits: *E. coli* = 235/100 mL
Meet Water Quality Objectives (Wet)	3/23/2040	Single Sample Limits: *E. coli* = 235/100 mL
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Metals (Total Copper (Dry), Total Lead (Dry), Total Zinc (Dry), Total Cadmium)		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets
Meet Water Quality Objectives	3/23/2032	Total Recoverable Metals Freshwater Targets: Copper (Dry)[4] = 19.71 ug/L; Lead (Dry)[4] = 9.70 ug/L; Zinc (Dry)[4] = 251.58 ug/L; Cadmium (Dry)[4] = 4.90 ug/L; Cadmium (Wet)[4] = 2.07 ug/L
Sediment-Bound Historical Organics (DDT, PCBs)		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets
Meet Water Quality Objectives	3/23/2032	Total DDT (ERL) = 1.58 ug/kg; Total DDT (ERM) = 46.1 ug/kg; Total PCBs (ERL) = 22.7 ug/kg; Total PCBs (ERM) = 180 ug/kg
Cyanide		
Conduct Monitoring through CIMP to confirm exceedances	Ongoing	
Evaluate Monitoring Data	3/23/2017	Cyanide (Dry) = 5.2 ug/L; Cyanide (Wet) = 22 ug/L
Ammonia (Dry)		
Conduct Monitoring through CIMP to confirm exceedances	Ongoing	
Evaluate Monitoring Data	3/23/2017	
Meet Water Quality Objectives (Dry)	3/23/2032	30-day average pH and temperature dependent[3] water quality objective for Ammonia as N
Meet Water Quality Objectives (Wet)	3/23/2032	One-hour average pH and temperature dependent[3] water quality objective for Ammonia as N
pH		
Conduct Monitoring through the CIMP	Ongoing	
Evaluate Monitoring Data	3/23/2017	6.5 < pH < 8.5

Table E.22: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Torrance Lateral		
	Date	Receiving Water Quality Objectives

(1) Baseline will be identified during the Reasonable Assurance Analysis Process.
(2) Acute total recoverable metals freshwater targets shown using the site specific conversion factors listed in the Dominguez Channel Toxics TMDL. Factors utilize a hardness of 50 mg/L. Dissolved metals CTR criteria at the equivalent hardness are as follows: Copper (Wet) = 6.99 ug/L; Lead (Wet) = 30.14 ug/L; Zinc (Wet) = 65.13 ug/L.
(3) Ambient pH and temperature measurements will be taken at the time of sampling to determine the applicable receiving water quality target.
(4) A hardness of 50 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 240 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.
(5) The Dominguez Channel Estuary Water Quality Objectives are assuming saltwater conditions.
(6) A hardness of 205 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 570 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.

Table E.23: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Dominguez Channel Estuary

	Date	Receiving Water Quality Objectives
Constituents Addressed in a TMDL		
Metals (Copper, Lead, Zinc, and Cadmium (sediment)), Historical Organics (DDT, PCBs, Chlordane, Dieldrin), Current Organics (PAHs), Sediment Toxicity, Benthic Community Effects		
Milestone 1	3/23/2026	50% reduction from baseline[1]
Milestone 2	3/23/2029	75% reduction from baseline[1]
Milestone 3	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs for wet weather metals and toxicity	3/23/2032	Receiving Water Targets: Copper (ERL) = 34 mg/kg; Lead (ERL) = 46.7 mg/kg; Zinc (ERL) = 150 mg/kg; Cadmium (ERL) = 1.2 mg/kg; Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg; Chlordane (ERL) = 0.5 mg/kg; Dieldrin (ERL) = 0.02 ug/kg; Total PAHs (ERL) = 4,022 ug/kg
Constituents on the 2010 303(d) list, but not Addressed in a TMDL		
Coliform Bacteria		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data and Determine if TMDL Development is Necessary	3/23/2017	
Meet Water Quality Objectives (Dry)	3/23/2040	Single Sample Limits: Total coliform = 10,000/100 mL; Fecal coliform = 400/100 mL; Enterococcus = 104/100 mL
Meet Water Quality Objectives (Wet)	3/23/2040	Single Sample Limits: Total coliform = 10,000/100 mL; Fecal coliform = 400/100 mL; Enterococcus = 104/100 mL
Ammonia		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data to support recommended delisting	3/23/2017	Dry = Unionized Ammonia-N (Dry) = 0.0287 mg/L Wet = Unionized Ammonia-N (Wet) = 0.192 mg/L
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Metals (Sediment - Arsenic, Chromium, Mercury, Silver; Dissolved - Silver, Nickel, Mercury, Thallium)		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets
Meet Water Quality Objectives	3/23/2032	Arsenic (ERL) = 8.2 mg/kg; Chromium (ERL) = 81 mg/kg; Mercury (ERL) =0.15 mg/kg; Silver (ERL)= 1.0 mg/kg; Silver = 1.9 ug/L; Nickel (Wet) = 74 ug/L; Nickel (Dry) = 8.2 ug/L; Mercury = 0.051 ug/L; Thallium = 6.3 ug/L

(1) Baseline will be identified during the Reasonable Assurance Analysis Process.
(2) Acute total recoverable metals freshwater targets shown using the site specific conversion factors listed in the Dominguez Channel Toxics TMDL. Factors utilize a hardness of 50 mg/L. Dissolved metals CTR criteria at the equivalent hardness are as follows: Copper (Wet) = 6.99 ug/L; Lead (Wet) = 30.14 ug/L; Zinc (Wet) = 65.13 ug/L.
(3) Ambient pH and temperature measurements will be taken at the time of sampling to determine the applicable receiving water quality target.
(4) A hardness of 50 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 240 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.
(5) The Dominguez Channel Estuary Water Quality Objectives are assuming saltwater conditions.
(6) A hardness of 205 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 570 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.

Table E.24: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Machado Lake		
	Date	**Receiving Water Quality Objectives**
Constituents Addressed in a TMDL		
Trash		
Achieve 20% Reduction from Baseline WLA through Installation of Full Capture Systems or Other Measures	3/6/2012	20% reduction from baseline
Achieve 40% Reduction from Baseline WLA through Installation of Full Capture Systems or Other Measures	3/6/2013	40% reduction from baseline
Achieve 60% Reduction from Baseline WLA through Installation of Full Capture Systems or Other Measures	3/6/2014	60% reduction from baseline
Achieve 80% Reduction from Baseline WLA through Installation of Full Capture Systems or Other Measures	3/6/2015	80% reduction from baseline
Achieve 100% Reduction from Baseline WLA through Installation of Full Capture Systems or Other Measures	3/6/2016	100% reduction from baseline
Nutrients (Total Phosphorus, Total Nitrogen, Dissolved Oxygen, Chlorophyll-a, Ammonia)		
LARWQCB approval of Nutrient LWQMP	2/14/2011	
LARWQCB approval of County's MRP	4/25/2012	
LARWQCB approval of County's Multipollutant TMDL Implementation Plan	9/12/2012	
LARWQCB conditional approval of LACFCD MRP	9/18/2013	
Meet 5-year Interim WLAs and LAs for Total Phosphorus and Total Nitrogen	3/11/2014	Total Phosphorus = 1.25 mg/L; Total Nitrogen = 2.45
LARWQCB approval of LACFCD's Nutrient TMDL Implementation Plan	4/17/2014	
TMDL Reconsideration by Regional Board (based on Optional Studies)	9/11/2016	
Meet Final WLAs and LAs for Total Phosphorus and Total Nitrogen	9/11/2018	Receiving Water Targets: Total Phosphorus = 0.1 mg/L; Total Nitrogen = 1.00; Ammonia (acute) = 5.95 mg/L; Ammonia (chronic) = 2.15 mg/L; Dissolved Oxygen = 5 mg/L; Chlorophyll a = 20 ug/L
Pesticides and PCBs (PCBs, DDT, Chlordane, Dieldrin)		
Submit MRP and QAPP (LACFCD)	9/20/2012	
Executive approval of MRP and QAPP	TBD	
Conduct Phase I Monitoring	2 year monitoring period beginning 60 days from the date of MRP and QAPP	
Conduct Phase II Monitoring	Conducted following Phase I Monitoring (for 5 year period)	
Submit Draft Implementation Plan to attain WLAs	6 months from the completion of Phase I Monitoring	
Submit Final Implementation Plan to attain WLAs (addressed through EWMP)	1 year from the	

Table E.24: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Machado Lake

	Date	Receiving Water Quality Objectives
	completion of Phase I Monitoring	
Amend Machado Lake Nutrient LWQMP, MRP and QAPP (City of LA) to include Pesticides and PCBs	9/20/2014	
Begin Implementation of LWQMP	60 days from LWQMP approval	
Meet Final WLAs and LAs for Pesticides and PCBs	9/30/2019	Receiving Water Targets: Total PCBs = 0.00017 ug/L; 4,4' DDT = 0.00059 ug/L; 4,4' DDE = 0.00059 ug/L; 4,4' DDD = 0.00084 ug/L; Chlordane = 0.00059 ug/L; Dieldrin = 0.00014 ug/L
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
E. coli		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data	Ongoing	
Meet Water Quality Objectives (Dry)	3/23/2040	Single Sample Limits: *E. coli* = 235/100 mL
Meet Water Quality Objectives (Wet)	3/23/2040	Single Sample Limits: *E. coli* = 235/100 mL
pH		
Conduct general chemistry monitoring under the CIMP for Phase I of Machado Lake Pesticides and PCBs TMDL		6.5 < pH < 8.5
Conduct general chemistry monitoring under the CIMP for Phase II of Machado Lake Pesticides and PCBs TMDL		6.5 < pH < 8.5

(1) Baseline will be identified during the Reasonable Assurance Analysis Process.
(2) Acute total recoverable metals freshwater targets shown using the site specific conversion factors listed in the Dominguez Channel Toxics TMDL. Factors utilize a hardness of 50 mg/L. Dissolved metals CTR criteria at the equivalent hardness are as follows: Copper (Wet) = 6.99 ug/L; Lead (Wet) = 30.14 ug/L; Zinc (Wet) = 65.13 ug/L.
(3) Ambient pH and temperature measurements will be taken at the time of sampling to determine the applicable receiving water quality target.
(4) A hardness of 50 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 240 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.
(5) The Dominguez Channel Estuary Water Quality Objectives are assuming saltwater conditions.
(6) A hardness of 205 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 570 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.

Table E.25: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Wilmington Drain		
	Date	**Receiving Water Quality Objectives**
Constituents on the 2010 303(d) list, but not Addressed in a TMDL		
Coliform Bacteria		
Conduct Monitoring through CIMP	Ongoing	
Evaluate Monitoring Data	Ongoing	
Meet Water Quality Objectives (Dry)	2040	Single Sample Limits: *E. coli* = 235/100 mL
Meet Water Quality Objectives (Wet)	2040	Single Sample Limits: *E. coli* = 235/100 mL
Metals (Total Copper and Total Lead)		
Conduct Monitoring through CIMP		
Evaluate Monitoring Data to support recommended delisting	3/23/2017	Total Recoverable Metals: Copper (Dry)6 = 41.28 ug/L; Lead (Dry)6 =29.17 ug/L; Copper (Wet)[6] = 27.53 ug/L; Lead (Wet)[6] = 203.61 ug/L
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Total Nitrogen		
Conduct Monitoring through the Machado Lake Nutrient TMDL requirements (LACFCD)		Total Nitrogen = 1.0 mg/L
Sediment-Bond Historical Organics (DDT, Chlordane, Dieldrin, PCBs)		
Conduct monitoring under Phase I of Machado Lake Pesticides and PCBs TMDL	2 year monitoring period beginning 60 days from the date of MRP approval	
Conduct monitoring under Phase II of Machado Lake Pesticides and PCBs TMDL	Conducted following Phase I Monitoring (for 5 year period)	Total PCBs = 0.00017 ug/L; 4,4' DDT = 0.00059 ug/L; 4,4' DDE = 0.00059 ug/L; 4,4' DDD = 0.00084 ug/L; Chlordane = 0.00059 ug/L; Dieldrin = 0.00014 ug/L

(1) Baseline will be identified during the Reasonable Assurance Analysis Process.
(2) Acute total recoverable metals freshwater targets shown using the site specific conversion factors listed in the Dominguez Channel Toxics TMDL. Factors utilize a hardness of 50 mg/L. Dissolved metals CTR criteria at the equivalent hardness are as follows: Copper (Wet) = 6.99 ug/L; Lead (Wet) = 30.14 ug/L; Zinc (Wet) = 65.13 ug/L.
(3) Ambient pH and temperature measurements will be taken at the time of sampling to determine the applicable receiving water quality target.
(4) A hardness of 50 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 240 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.
(5) The Dominguez Channel Estuary Water Quality Objectives are assuming saltwater conditions.
(6) A hardness of 205 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 570 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.

Table E.26: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Los Angeles Harbor Waters		
	Date	**Receiving Water Quality Objectives**
CONSOLIDATED SLIP		
Constituents Addressed in a TMDL		
Metals (Sediment - Cadmium, Chromium, Copper, Lead, Zinc, Mercury), Historical Organics (DDT, PCBs, Chlordane, Dieldrin, Toxaphene), Current Organics (PAHs), Sediment Toxicity, Benthic Community Effects		
Milestone 1	3/23/2026	50% reduction from baseline[1]
Milestone 2	3/23/2029	75% reduction from baseline[1]
Milestone 3	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs	3/23/2032	Receiving Water Targets: Cadmium (ERL) = 1.2 mg/kg; Chromium (ERL) = 81 mg/kg; Copper (ERL) = 34 mg/kg; Lead (ERL) = 46.7 mg/kg; Zinc (ERL) = 150 mg/kg; Mercury (ERL) = 0.15 mg/kg; Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg; Chlordane (ERL) = 0.5 ug/kg; Dieldrin (ERL) =0.02 ug/kg; Toxaphene (ERL) = 0.10 ug/kg; Total PAHs (ERL) = 4,022 ug/kg
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Metals (Sediment - Silver, Arsenic, Nickel)		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets
Meet Water Quality Objectives	3/23/2032	Silver (ERL) = 1.0 mg/kg; Arsenic (ERL) = 8.2 mg/kg; Nickel (ERL) = 20.9 mg/kg
FISH HARBOR		
Constituents Addressed in a TMDL		
Metals (Sediment - Copper, Lead, Zinc, Mercury), Historical Organics (DDT, PCBs, Chlordane), Current Organics (PAHs), Sediment Toxicity		
Complete Implementation of Dominguez Channel Toxics TMDL Phase I	3/23/2026	50% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase II	3/23/2029	75% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase III	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs	3/23/2032	Receiving Water Targets: Copper (ERL) = 34 mg/kg; Lead (ERL) = 46.7 mg/kg; Zinc (ERL) = 150 mg/kg; Mercury (ERL) = 0.15 mg/kg; Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg; Chlordane (ERL) = 0.5 ug/kg; Total PAHs (ERL) = 4,022 ug/kg
INNER CABRILLO BEACH		
Constituents Addressed in a TMDL		
Indicator Bacteria		
Initial compliance deadline through Los Angeles Harbor Bacteria TMDL for Cabrillo Beach	3/10/2010	Single Sample Limits: Total coliform = 10,000/100 mL; Fecal coliform = 400/100 mL; Enterococcus = 104/100 mL
Time Schedule Order requested	12/24/2012	
Meet Interim number of allowable exceedance days of WQBELs and Receiving Water Limitations for total coliform, fecal coliform, and enterococcus	2/6/2013	Single Sample Summer Dry Weather = 23 days/year; Single Sample Winter Dry Weather = 18 days/year; Geometric Mean Year round = 79 days/year

Table E.26: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Los Angeles Harbor Waters		
	Date	**Receiving Water Quality Objectives**
Investigate and institute additional non-structural BMPs and simple structural BMPs	7/31/2014	
Assess effectiveness of non-structural BMPs and simple structural BMPs	12/31/2014	
Assess feasibility of diversion of identified storm drains impacting Station CB01 and construct feasible storm drain modifications	12/31/2014	
Continue Monitoring through the CIMP	Ongoing	
Achieve final RWLs for total coliform, fecal coliform, and enterococcus	12/28/2017	Single Sample Limits: Total coliform = 10,000/100 mL; Fecal coliform = 400/100 mL; Enterococcus = 104/100 mL
Historical Organics (DDT, PCBs)		
Complete Implementation of Dominguez Channel Toxics TMDL Phase I	3/23/2026	50% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase II	3/23/2029	75% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase III	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs	3/23/2032	Receiving Water Targets: Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg
CABRILLO MARINA		
Constituents Addressed in a TMDL		
Historical Organics (DDT, PCBs), Current Organics (PAHs)		
Complete Implementation of Dominguez Channel Toxics TMDL Phase I	3/23/2026	50% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase II	3/23/2029	75% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase III	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs	3/23/2032	Receiving Water Targets: Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg; Total PAHs (ERL) = 4,022 ug/kg
LOS ANGELES / LONG BEACH INNER HARBOR		
Constituents Addressed in a TMDL		
Indicator Bacteria		
Expected Compliance through Los Angeles Harbor Bacteria TMDL for Main Ship Channel	3/10/2010	Single Sample Limits: Total coliform = 10,000/100 mL; Fecal coliform = 400/100 mL; Enterococcus = 104/100 mL
Conduct Monitoring through the CIMP	Ongoing	
Metals (Sediment - Copper, Zinc), Historical Organics (DDT, PCBs), Current Organics (PAHs), **Benthic Community Effects, Sediment Toxicity**		
Complete Implementation of Dominguez Channel Toxics TMDL Phase I	3/23/2026	50% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase II	3/23/2029	75% reduction from baseline[1]
Complete Implementation of Dominguez Channel Toxics TMDL Phase III	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs	3/23/2032	Receiving Water Targets: Copper (ERL) = 34 mg/kg; Zinc (ERL) = 150 mg/kg; Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg; Total PAHs (ERL) = 4,022 ug/kg
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Metals (Total Copper, Total Silver)		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets

Table E.26: Dominguez Channel Watershed Management Area Compliance Schedule – Milestone: Los Angeles Harbor Waters		
	Date	**Receiving Water Quality Objectives**
Meet Water Quality Objectives	3/23/2032	Total Recoverable Copper (Wet) = 5.8 ug/L; Dissolved Copper (Dry) = 3.1 ug/L; Total Recoverable Silver = 2.24 ug/L
LOS ANGELES / LONG BEACH OUTER HARBOR		
Constituents Addressed in a TMDL		
Historical Organics (DDT, PCBs, Sediment Toxicity)		
Milestone 1	3/23/2026	50% reduction from baseline[1]
Milestone 2	3/23/2029	75% reduction from baseline[1]
Milestone 3	3/23/2032	Attain Receiving Water Targets
Meet Final WLAs and LAs	3/23/2032	Receiving Water Targets: Total DDT (ERL) = 1.58 ug/kg; Total PCBs (ERL) = 22.7 ug/kg
Constituents Exceeding Water Quality Objectives, but not on the 2010 303(d) List		
Metals (Sediment - Cadmium, Copper, Nickel, Mercury; Dissolved - Copper, Silver)		
Review progress based on implementation of BMPs	3/23/2026	Anticipated significant reduction from baseline
Complete BMPs to achieve receiving water targets.	3/23/2032	Attain Receiving Water Targets
Meet Water Quality Objectives	3/23/2032	Cadmium (ERL) = 1.2 mg/kg; Copper (ERL) = 34 mg/kg; Nickel (ERL) = 20.9 mg/kg; Mercury (ERL) = 0.15 mg/kg; Copper (Wet) = 4.8 ug/L; Copper (Dry) = 3.1 ug/L; Silver = 1.9 ug/L

(1) Baseline will be identified during the Reasonable Assurance Analysis Process.
(2) Acute total recoverable metals freshwater targets shown using the site specific conversion factors listed in the Dominguez Channel Toxics TMDL. Factors utilize a hardness of 50 mg/L. Dissolved metals CTR criteria at the equivalent hardness are as follows: Copper (Wet) = 6.99 ug/L; Lead (Wet) = 30.14 ug/L; Zinc (Wet) = 65.13 ug/L.
(3) Ambient pH and temperature measurements will be taken at the time of sampling to determine the applicable receiving water quality target.
(4) A hardness of 50 mg/L was assumed for wet weather hardness-dependent metals and a hardness of 240 mg/L was assumed for dry weather hardness dependent metals. Site-Specific conversion factors were not available.
(5) The Dominguez Channel Estuary Water Quality Objectives are assuming saltwater conditions.

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Attachment F

RAA Modeling

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MEMORANDUM

Contents

1. Introduction

In response to the Los Angeles County National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (Permit), Order No. R4-2012-0175 the Dominguez Channel Watershed Management Group (DC WMG) is in the process of developing an Enhanced Watershed Management Program (EWMP). As specified in Part VI.C.1.g of the MS4 Permit, an EWMP comprehensively evaluates the opportunities that, wherever feasible, retain all non-stormwater, such as overflow irrigation, and stormwater runoff from the 85th percentile, 24-hour storm event from the tributary watershed. These projects are also referred to as regional EWMP projects. Areas that drain to regional EWMP projects are considered in compliance with all water quality standards. For the remaining areas a Reasonable Assurance Analysis (RAA) must be conducted to demonstrate that selected Best Management Practices (BMPs) provide reasonable assurance that applicable WQBELs and RWLs will be attained.

This Technical Memorandum (TM) explains the methodology of the RAA for the DC WMG EWMP. The RAA developed for the DC WMG is in conformance with the RAA Guidelines developed by the Regional Water Quality Control Board (RWQCB or Regional Board).

Additionally, this TM discusses in detail the calibration process associated with stormwater flow through the system and the corresponding water quality. The purpose of the RAA is to demonstrate that the implementation scenarios proposed in the EWMP will meet the applicable Water Quality Based Effluent Limitation (WQBELs) and Receiving Water Limitations (RWLs) within the DC WMG. This is done by demonstrating load reductions for the 85th percentile, 24-hour storm and the 90th percentile load. Typically, the 85th percentile, 24-hour storm event volume is addressed by regional projects. The 90th percentile load criteria was used to propose control measures, as addressing the 90th percentile load provides reasonable assurance with meeting water quality objectives. Capture of the 90th percentile, 24-hour load and volume provides a high threshold for constituent loads to escape the BMPs. More detail is provided in the EWMP on selection of the appropriate storm/load for this criterion and the expected load reductions and constituent concentrations after the BMPs associated with this criterion are implemented. In many cases, the 90th percentile loads with similar volumes to the 85th percentile, 24-hour storm volume provide a double assurance that loads will meet MS4 Permit requirements and meet the Water Quality Objectives (WQOs).

2. Modeling Software Used for RAA

The RAA for the DC WMG was conducted using the BMP modeling system Watershed Management Modeling System (WMMS). WMMS is a regional model developed by the Los Angeles County Flood Control District (LACFCD) and is comprised of two main components: Load Simulation Program in C++ (LSPC) and the Regional Optimization system. The Regional Optimization system was not used while conducting the DC WMG RAA. LSPC was developed from the Hydrologic Simulation Program - FORTRAN (HSPF) used for simulating hydrology, sediment, and general water quality. The model generates runoff based on rainfall, snow, and groundwater inputs, determines pollutant loading and transport based on point source data, aerial deposition, and non-point source loadings, determines chemical and transport interactions within stream reaches, and can provide water quality data based on the interactions for specified locations. WMMS and the LSPC modeling component are included in the list of approved watershed models for conducting a RAA outlined in Part VI.C.5.b.iv.(5) of the MS4 Permit.

Additional information regarding WMMS and LSPCS is available from the Los Angeles County Department of Public Works (LACDPW) (2008, 2010a, 2010b, 2010c, 2011, 2013). Information pertaining to LSPC is available from the United States Environmental Protection Agency (USEPA, 2003). The documents can be found on the WMMS homepage (http://dpw.lacounty.gov/wmd/wmms/) where it can also be downloaded.

3. Dry-Weather Modeling Approach

The approach to the dry-weather portion of the DC WMG RAA is to evaluate the volume and sediment reduction potential provided by proposed regional and distributed BMP projects to determine how much of the dry-weather flows would be addressed. This approach does not include the use of a model due to data set limitations and significant spatial variation throughout the DC WMG for dry-weather flows. Estimated daily yields are derived from local dry-weather flow monitoring data collected at Mass Emissions site S28 and is summarized in **Table 3-1**. The monitoring data collected at S28 was analyzed to determine an average discharge per acre ratio per month for the period of analysis (2002-2012). The resulting monthly averages were then applied to the DC WMG area to identify the volume per day generated within the group area. The flows presented in the table represent existing conditions and do not take into account the control measures proposed in the EWMP.

Table 3-1 Average Monthly Dry-Weather Flow in DC WMG

Month	Average Flow (cfs)/Acre	DC WMG Volume per Day (acre-feet/day)
January	0.00026	19.41
February	0.00032	23.89
March	0.00033	24.64
April	0.00035	26.13
May	0.00025	18.66
June	0.00041	30.61
July	0.00030	22.4

August	0.00024	17.92
September	0.00022	16.42
October	0.00027	20.16
November	0.00020	14.93
December	0.00022	16.42

Flows captured through regional BMP implementation were subtracted from the total assumed non-stormwater flows (presented in the table) to quantify pollutant load reductions. The BMPs used for this analysis are discussed further in Section 4 of the EWMP. Based on the volume of storage provided by the proposed regional and distributed BMPs, the dry-weather flows will be eliminated, as encouraged by the MS4 Permit. The volume provided by the proposed control measures is significantly greater than the volume of dry-weather runoff produced within the DC WMG. The critical dry-weather conditions were not assessed, as the control measures proposed in the EWMP have adequate capacity to capture the dry-weather runoff.

Control measures specifically for dry-weather are not proposed in the DC WMG EWMP. An analysis was performed to assess how many low flow diversions would be required to address dry-weather flows and it was determined that over 100 would be necessary. By the time the wet-weather controls are implemented, the dry-weather diversions would not be used, as flows would be captured at the proposed BMPs. For this reason, dry-weather will be addressed by the wet-weather controls.

4. Wet-Weather Modeling Approach

The wet-weather RAA approach allowed for estimating the level of BMP implementation needed to meet applicable WQBELs and RWLs. This approach incorporated pollutant prioritization and structural BMP implementation scenarios, while considering stakeholder input through a transparent process.

The wet-weather RAA approach involved the estimation of both the existing pollutant loads (baseline) and target load reductions as a percentage of the total load. WMMS provided optimized load reduction targets, recommended distributed BMPs, and cost estimates, however, limited guidance on BMP placement is provided and the model does not optimize bacteria or trash Total Maximum Daily Load (TMDL). Trash is only a concern in the Machado Lake and Wilmington Drain Watersheds. Trash is assumed to be addressed through the installation of full capture devices as required by the Machado Lake Trash TMDL. Bacteria was modeled, however, it is not the limiting pollutant based on high flow suspension and allowable exceedance days.

Once the baseline conditions are estimated, watershed control measures were selected and modeled to be implemented over time to meet applicable WQBELs and RWLs. The selected control measures, such as regional BMP projects, distributed BMPs (green streets), and Minimum Control Measures (MCMs), were then modeled at various stages within the implementation time frame to estimate the quantity, location, and timing of BMP implementation to meet the interim and final WLAs applicable to the DC WMG. Targets for the RAA are based on interim time steps throughout the MS4 Permit time frame, which are defined by WQBELs and RWLS along with their corresponding schedules. The milestones used for the DC WMG RAA are outlined as follows:

- March 10, 2010 (Final WLAs Los Angeles Inner Harbor Bacteria TMDL)
- March 6, 2016 (Final WLAs Machado Lake Trash TMDL)
- September 11, 2018 (WLAs Machado Lake Nutrients TMDL)
- September 30, 2019 (Wet-Weather WLAs Machado Lake Pesticides and PCBs TMDL)
- September 30, 2026 (Internal Date for Construction Schedule Evaluation – 50 percent reduction in metals)

- September 30, 2029 (Internal Date for Construction Schedule Evaluation – 75 percent reduction in metals)
- March 23, 2032 (Wet-Weather Freshwater WQBEL Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL)

Demonstrating compliance through the RAA is an iterative process. The model includes different BMP scenarios at the compliance time steps and different approaches to BMP implementation are modeled to determine the most cost effective approach. The iterative process involves model calibration, model validation, baseline simulation, determination of the limiting pollutant, evaluation of required volume and load reductions, and control measure implementation, all of which are further detailed in this TM and in the DC WMG EWMP.

5. LSPC Calibration

Calibration refers to the adjustment or fine-tuning of modeling parameters to reproduce observations on the basis of field monitoring data. The goal of the LSPC model calibration was to obtain physically realistic model predictions by selecting parameter values that reflect the unique characteristics of the DC WMA. Spatial and temporal aspects were evaluated through the calibration process. Model calibration and validation were necessary to demonstrate the calibrated model properly assessed all the model parameters and modeling conditions that can affect model results for hydrologic and water quality analyses. The Regional Board provided acceptable model calibration criteria in Table 3.0 of the RAA Guidelines. The hydrology (flow) from the DC WMG was calibrated along with the water quality parameters described in the following subsections.

5.1 Hydrologic Calibration

The hydrologic calibration effort resulted in parameter values that produced the best overall agreement between simulated and observed stream flow volumes and timing throughout the calibration period. The time interval used for the calibration period began October 1, 2004 and ended September 30, 2012 due to the limited water quality data from the closest Mass Emission Station (MES). Rainfall data was taken from three LACFCD recording rain gauges and one National Climatic Data Center (NCDC) rain gauge near the area upstream of the mass emission station that was used for calibration. Three other NCDC weather stations were used to provide both rainfall and air temperature. Air temperature is used to derive pan evapotranspiration (PET) values for use in evaluating the impact of climate on soil moisture and plant uptake conditions in the model. Calibration included a time series comparison of daily and monthly values. Composite comparisons were also made to evaluate average monthly stream flow values over the period of record.

The basis for distributing hydrologic and water quality parameters is provided by the current land use coverage of the entire watershed. Land unit representation should be sensitive to the features of the landscape that most affect hydrology and pollutant transport, including land use (impervious assumptions), soils, and slope. Although most of the DC WMA is comprised of relatively flat terrain, slope factors must also be taken into consideration. The combination of land use, soil hydrologic group, and slope were used to define the 21 hydrologic response units (HRUs) used in LSPC. Nine of the HRUs are considered impervious for which most of the hydrologic parameters are not relevant, and the other 12 are predominately pervious types such as vacant or vegetated open space. Mixed land use areas were divided into impervious area and pervious areas based on acceptable regional values. For example, a commercial development is considered to be 90 percent impervious. The Commercial HRU is 100 percent impervious, but the other 10 percent of a commercial parcel is added to the "Urban_Grass_Irrigated" HRU.

As part of the iterative calibration approach, default parameter values were modified and input to the LSPC model. The results were compared with observed values obtained from MES S28. MES S28 was used for both the hydrology and water quality calibrations and is located at the Artesia Boulevard Bridge, approximately 1.3 miles upstream from the transitions between Dominguez Channel and the Dominguez Channel Estuary. Statistical analysis was conducted to measure the difference between observed and modeled values. The analysis applied a linear bias as the general error percentage and added root mean square and coefficient of correlation evaluations to examine statistical variations. **Figure 5-1** illustrates the linear bias relationship from the statistical analysis. The objective was to achieve model results within the defined range specified in Table 3.0 of the RAA Guidelines.

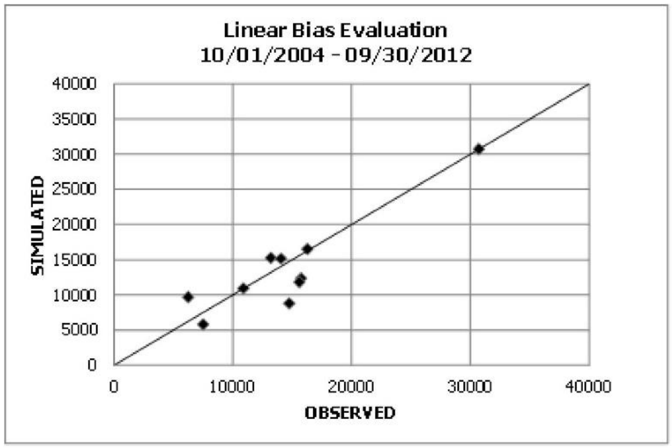

Figure 5-1 Linear Bias Evaluation for Flow Calibration at MES S28

5.1.1 Water Budget Parameter Calibration

The model set-up for the DC WMG RAA has 24 individual modeling parameters for the water budget (PWAT), three of which were selected as calibration parameters. **Table 5-1** summarizes the calibration parameters including their default values (def) and calibration values (cal) used in the model runs associated. The calibrated values are italicized in the table indicating values that differ from the default values. The table also identifies whether each HRU is pervious (p) or impervious (imp). The definitions for the calibrated parameters are as follows:

- lzsn – lower zone nominal storage (inches)
- deepfr – fraction of groundwater inflow which will enter deep (inactive) groundwater and be lost
- cepsc – interception storage capacity (inches)

Table 5-1 LSPC Calibrated Water Budget Parameter Values

LUID	HRU	p/imp	lzsn		deepfr		cepsc	
			def	cal	def	cal	def	cal
1	HD_SF_Residential	imp	0	0	0.0	0.00	0.05	*0.2*
2	LD_SF_Res_Moderate	imp	0	0	0.0	0.00	0.05	*0.2*
3	LD_SF_Res_Steep	imp	0	0	0.0	0.00	0.05	*0.2*
4	MF_Res	imp	0	0	0.0	0.00	0.05	*0.2*
5	Commercial	imp	0	0	0.0	0.00	0.05	*0.2*
6	Institutional	imp	0	0	0.0	0.00	0.05	*0.2*
7	Industrial	imp	0	0	0.0	0.00	0.05	*0.2*

Table 5-1 LSPC Calibrated Water Budget Parameter Values								
LUID	**HRU**	**p/imp**	**lzsn**		**deepfr**		**cepsc**	
			def	**cal**	**def**	**cal**	**def**	**cal**
8	Transportation	imp	0	0	0.0	0.00	0.05	*0.2*
9	Secondary_Roads	imp	0	0	0.0	0.00	0.05	*0.2*
10	Urban_Grass_Irrigated	p	7	*15*	0.5	*0.95*	0.10	*0.2*
11	Urban_Grass_NonIrrigated	p	7	*15*	0.5	*0.95*	0.10	*0.2*
12	Agriculture_Moderate_B	p	7	*15*	0.5	*0.95*	0.10	*0.2*
13	Agriculture_Moderate_D	p	7	*15*	0.5	*0.95*	0.10	*0.2*
14	Vacant_Moderate_B	p	7	*15*	0.5	*0.95*	0.15	*0.2*
15	Vacant_Moderate_D	p	7	*15*	0.5	*0.95*	0.15	*0.2*
16	Vacant_Steep_A	p	7	*15*	0.5	*0.95*	0.20	*0.2*
17	Vacant_Steep_B	p	7	*15*	0.5	*0.95*	0.20	*0.2*
18	Vacant_Steep_C	p	7	*15*	0.5	*0.95*	0.20	*0.2*
19	Vacant_Steep_D	p	7	*15*	0.5	*0.95*	0.20	*0.2*
20	Water	p	7	*15*	0.0	*0.95*	0.00	*0.2*
21	Water_Reuse	p	7	*15*	0.5	*0.95*	0.10	*0.2*

HD = High Density, HRU = Hydrologic Response Unit, LD = Low Density, LUID = Land Use Identification, MF = Multi Family, SF = Single Family

Table 3.1 in the RAA Guidelines identifies the acceptable "Range of Initial Values" for the model parameters based on the USEPA Basins Technical Note 6 (EPA BTN #6). The "Range of Initial Values" specified are as follows and the calibrated values used for the DC WMA are within the acceptable range:

- lzsn: 2.0 – 15.0
- deepfr: 0.0 – 0.50
- cepsc: 0.01 – 0.40

The modified lzsn and cepsc values are within the range specified in the RAA Guidelines, while the deepfr parameter is beyond the range specified in EPA BTN #6. The rationale for using a higher fraction of infiltration to deep groundwater is related to the urban setting of the DC WMA and the configuration of the storm drain network. The calibration section of the DC WMA is nearly completely developed with a high fraction of impervious surfaces which prevent a large fraction of water from infiltrating. The drainage system is comprised of streets, storm drains of reinforced concrete or metal pipe, and concrete lined channels, i.e., Dominguez Channel and the tributary lateral channels. The asphalt and concrete lined nature of the system allows virtually no connection between interflow/groundwater and the surface water bodies/receiving waters. This also explains the high value used for the lzsn parameter because there is little opportunity for lower zone water storage to migrate via interflow to receiving waters. The higher the lzsn value, the lower the probability that this water will flow to receiving waters. The water either runs off during the storm or infiltrates and is lost to evapotranspiration or groundwater aquifers without flowing to water bodies.

As a confirmation that model parameters modified in the calibration effort provide output results that are in agreement with observed values within the specified range noted in the RAA Guidelines, a statistical analysis to determine linear bias was performed to find the percent difference between simulated and observed values. Linear bias is a measure of the difference in the sum of all simulated output results and the sum of all observed values divided by the sum of all simulated output results.

$$Linear\ Bias\ (percent) = \frac{\sum LSPC\ Output - \sum Recorded\ Values}{\sum Recorded\ Values}\ x\ 100$$

Table 3.0 of the RAA Guidelines states that percent differences between 15 and 25 percent are considered fair, differences between ten and 15 percent are considered good, and differences less than ten percent are considered very good for the hydrology/flow model parameters. **Table 5-2** presents the results from the statistical analysis performed based on the calibrated and recorded values for the water budget parameters. The daily and monthly differences are less than ten percent which demonstrates a very good correlation between observed flow rates and modeled flow rates.

Table 5-2 Water Budget Parameter Statistics

Parameter	Root Mean Square (RMSE)	Linear Bias	Coefficient of Correlation (C.C.)
Water Budget - Daily	83.33	0.012	0.35
Water Budget - Monthly	12.26	0.014	0.89

5.2 Water Quality Calibration

The LACFCD operates the Los Angeles County Monitoring Program to provide technical data and information to support effective watershed stormwater quality management programs in Los Angeles County which includes MES S28 as previously mentioned. MES are equipped with automated water samplers and stage recorders that collect both composite and grab samples during storm events. The subwatershed tributary to MES S28 is comprised of 42 subbasins within the greater DC WMA. Although MES S28 is located in the upper half of the DC WMA, the subwatershed land use and hydrological characteristics are representative of the entire DC WMA with regard to water quality constituent composition and concentrations. As more water quality data is collected through the Coordinated Integrated Monitoring Program (CIMP), validation and fine tuning of the water quality parameters may be possible. The data collected at MES S28 is collected as an event mean concentration (EMC), which is done by either collecting one sample throughout the event or combining multiple samples collected throughout time into a combined sample for lab analysis. Event pollutographs have not been collected at MES S28, where the collected (observed) sample concentrations are averaged over the length of the rain event or a single grab sample is collected. The model is run on a daily basis and the simulated daily values are averaged over the time frame of the observed rain event. For example, an observed rain event may last two to three days and the observed EMC is derived from the number of samples collected (at the particular location) and mixed together and averaged over the length of event. The simulated results are taken from the same time period and averaged to derive a simulated EMC.

The model used for the DC WMG RAA was calibrated based on the following water quality calibration parameters. Each is further discussed in the following subsections:

- Total Suspended Solids (TSS)
- Metal parameters – copper, lead, and zinc
- Fecal coliform
- Total nitrogen and total phosphorus

Fecal coliform was used rather than E. coli because there are modeling standards established for fecal coliform, but not E. coli. E. coli has a freshwater standard that is applicable to the Dominguez Channel above the Estuary, but the marine water found downstream of Dominguez Channel in the Estuary and Harbor does not have an E. coli standard. However, in most cases fecal coliform is almost completely E. coli. Historical organics, such as PCBs and DDT, are often related to sediments. Relationships between

TSS and historical organics were evaluated to determine if TSS could be used as a surrogate. There were too many non-detects in the available water quality data to establish any type of relationship. By addressing TSS, it is assumed that other historical organics will also be addressed.

Dry-weather flows were also calibrated in the initial phases of model calibration. Empirical data was incorporated into the model as point source to simulate dry-weather conditions. Current dry-weather flows are assumed to occur until the proposed wet-weather control measures are implemented, which will capture those flows as explained in **Section 3**. Once it was determined that wet-weather control measures would address dry-weather runoff, it was no longer considered a major component of the modeling.

5.2.1 Total Suspended Sediment Parameter Calibration

The model set-up for the DC WMG RAA has 18 individual modeling parameters for the sediment group (SED), five of which were selected as calibration parameters. **Table 5-3** summarizes the calibration parameters including their default values (def) and calibration values (cal) used in the model runs. The calibrated values are italicized in the table indicating values that differ from the default values. The definitions for the calibrated parameters are as follows:

- kser – coefficient in the detached sediment washoff equation
- accsdp – rate at which solids accumulate on the land surface
- sed_suro – constant surface trace sediment concentration
- sed_ifwo – constant interflow trace sediment concentration
- sed_agwo – constant groundwater trace sediment concentration

Table 5-3 LSPC Calibrated Sediment Parameters

LUID	kser		accsdp		sed_suro		sed_ifwo		sed_agwo	
	def	cal	def	cal	def	cal	def	cal	def	cal
1	0.035	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
2	0.030	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
3	0.030	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
4	0.035	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
5	0.070	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
6	0.065	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
7	0.065	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
8	0.085	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
9	0.085	*1*	0.001	*0.0007*	0	*75*	0	*75*	0	*75*
10	0.001	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
11	0.100	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
12	0.100	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
13	0.100	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
14	0.100	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
15	0.100	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
16	0.150	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
17	0.150	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
18	0.150	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
19	0.150	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*

Table 5-3 LSPC Calibrated Sediment Parameters

LUID	kser		accsdp		sed_suro		sed_ifwo		sed_agwo	
	def	cal	def	cal	def	cal	def	cal	def	cal
20	0.000	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*
21	0.100	*1*	0.000	0.0000	0	*75*	0	*75*	0	*75*

LUID = Land Use Identification (defined in **Table 5-1**)

Sediment concentration parameters (sed_suro, sed_ifwo, sed_agwo) provide the model with the capability to match baseflow observations. These variables have no range specified in the RAA Guidelines. The coefficient for detachment, kser, is a primary parameter in calibrating sediment loading rates which is a measure of the build-up of surface sediment between rain events. This is a calibration parameter with a typical calibration range between 0.5 and 5. The rate of solids accumulation, accsdp, is the primary source of solids from impervious areas with a range on impervious surfaces from 0.0 to 2.

Table 3.0 of the RAA Guidelines states that percent differences between 30 and 45 percent are considered fair, differences between 20 and 30 percent are considered good, and differences less than 20 percent are considered very good for sediment model parameters. **Table 5-4** and **Figure 5-2** summarize the statistical data associated with the calibrated model (SIM) as compared to the recorded values (OBS) for TSS. The RAA Guidelines specify that the model calibration criteria for the simulated results for the sediment falls into the very good ranking with a percent difference less than twenty percent.

Table 5-4 Sediment Parameter Statistics			
Parameter	**Root Mean Square (RMSE)**	**Linear Bias**	**Coefficient of Correlation (C.C.)**
TSS	159.25	-0.0016	0.49

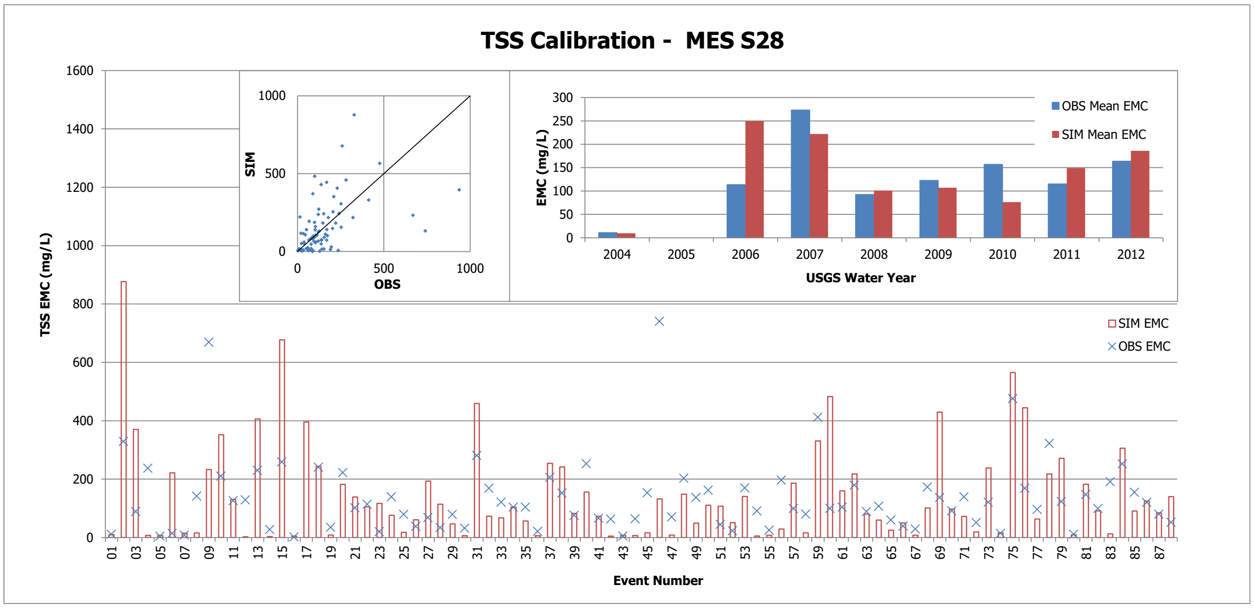

Figure 5-2 Sediment Calibration Statistics at MES S28

5.2.2 Metal Parameter Calibration

The LSPC model for general water quality parameters (GQUAL) uses three priority metal pollutants, copper, lead, and zinc. This section discusses the parameter calibration for the three metal pollutants while the following subsections cover the remaining general water quality parameters. The model set-up for the DC WMG RAA has 12 individual modeling parameters for each of the general water quality parameters, one of which was selected as a calibration parameter. **Table 5-3** summarizes the calibration parameters including their default values (def) and calibration values (cal) used in the model runs. The calibrated values are italicized in the table indicating values that differ than the default values. The definitions for the calibrated parameters are as follows:

- potfw – washoff potency factor

Table 5-5 LSPC Calibrated Metals Parameters						
LUID	**Copper**		**Lead**		**Zinc**	
	potfw		**potfw**		**potfw**	
	def	**cal**	**def**	**cal**	**def**	**cal**
1	0.800	*1.072*	0.800	*0.313*	7.50	*4.484*
2	0.600	*0.804*	0.200	*0.078*	1.20	*0.717*
3	0.600	*0.804*	0.200	*0.078*	1.20	*0.717*
4	0.800	*1.072*	0.800	*0.313*	7.50	*4.484*
5	1.140	*1.528*	1.000	*0.391*	10.20	*6.098*

Table 5-5 LSPC Calibrated Metals Parameters						
LUID	Copper		Lead		Zinc	
	potfw		potfw		potfw	
	def	cal	def	cal	def	cal
6	0.400	*0.536*	0.180	*0.070*	5.08	*3.037*
7	0.400	*0.536*	0.180	*0.070*	5.08	*3.037*
8	0.800	*1.072*	0.800	*0.313*	7.50	*4.484*
9	0.800	*1.072*	0.800	*0.313*	7.50	*4.484*
10	0.600	*0.804*	0.200	*0.078*	1.20	*0.717*
11	0.600	*0.804*	0.200	*0.078*	1.20	*0.717*
12	0.300	*0.402*	0.100	*0.039*	2.50	*1.495*
13	0.300	*0.402*	0.100	*0.039*	2.50	*1.495*
14	0.012	*0.016*	0.002	*0.001*	0.05	*0.030*
15	0.012	*0.016*	0.002	*0.001*	0.05	*0.030*
16	0.012	*0.016*	0.002	*0.001*	0.05	*0.030*
17	0.012	*0.016*	0.002	*0.001*	0.05	*0.030*
18	0.012	*0.016*	0.002	*0.001*	0.05	*0.030*
19	0.012	*0.016*	0.002	*0.001*	0.05	*0.030*
20	0.000	0.000	0.000	0.000	0.00	0.000
21	0.600	*0.804*	0.200	*0.078*	1.20	*0.717*

LUID = Land Use Identification (defined in **Table 5-1**)

The default value of potfw for each land use was modified by assuming a linear build-up/washoff relationship of the metal of interest and adjusting the input parameter accordingly to achieve the best agreement of simulated and observed values. **Table 5-6**, **Figure 5-3**, **Figure 5-4**, and **Figure 5-5** summarize the statistical data associated with the calibrated model (SIM) as compared to the recorded values (OBS) for copper, lead, and zinc. The RAA Guidelines do not specify the modal calibration criteria for metals, but it can be assumed the calibration would fall into very good as the percent differences are less than ten percent.

Table 5-6 Metal Parameter Statistics			
Parameter	Root Mean Square (RMSE)	Linear Bias	Coefficient of Correlation (C.C.)
Copper	93.76	8.32E-05	0.54
Lead	23.02	1E-03	0.61
Zinc	360.40	-6E-06	0.62

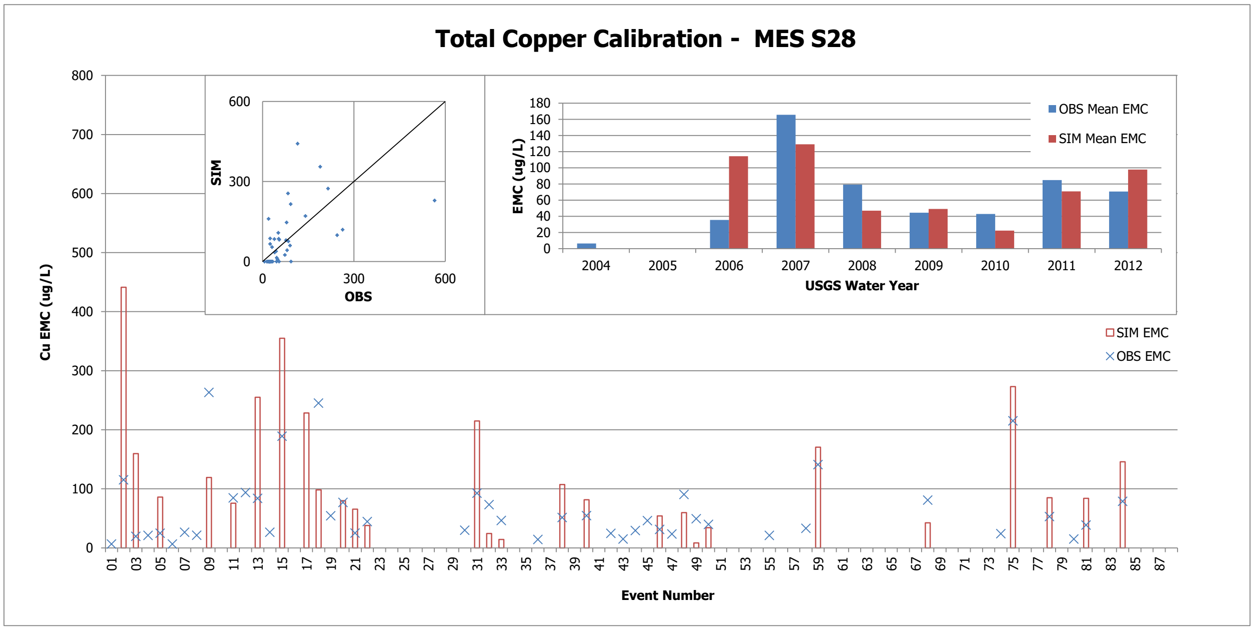

Figure 5-3 Copper Calibration Statistics at MES S28

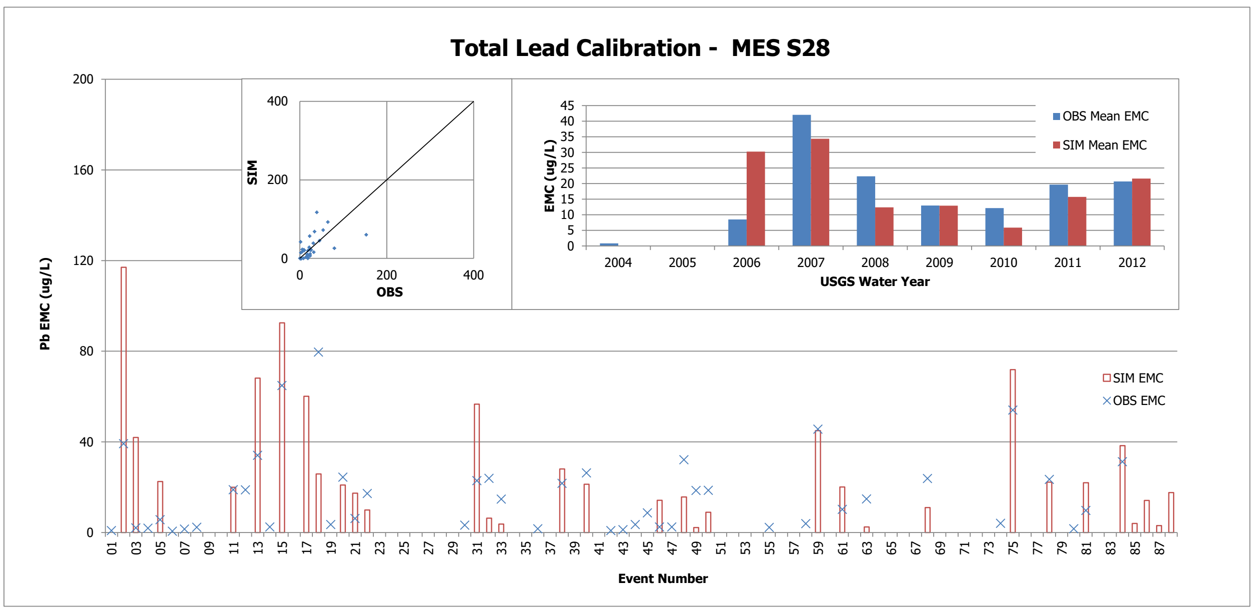

Figure 5-4 Lead Calibration Statistics at MES S28

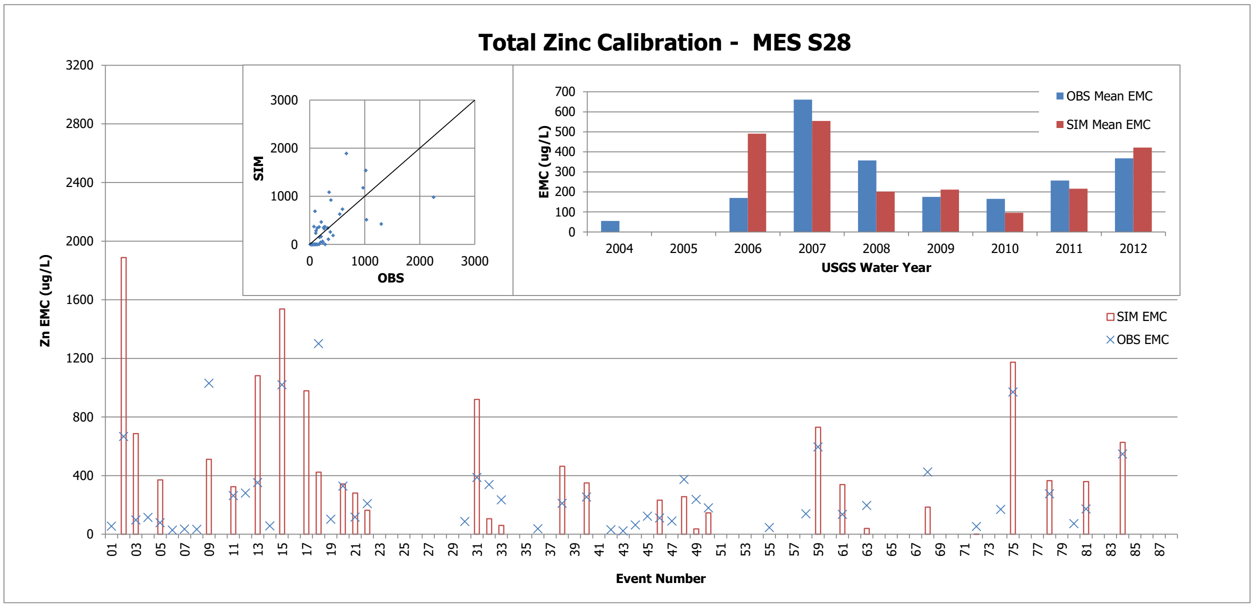

Figure 5-5 Zinc Calibration Statistics at MES S28

5.2.3 Fecal Coliform Parameter Calibration

The LSPC model for general water quality parameter (GQUAL) uses total fecal coliform as the indicator bacteria. Although the indicator used in more recent tests is fecal coliform, the historic data was collected using total fecal coliform as the bacteria sample criteria. The model set-up for the DC WMG RAA has 12 individual modeling parameters for each of the general water quality parameters, two of which were selected as calibration parameters. **Table 5-7** summarizes the calibration parameters including their default values (def) and calibration values (cal) used in the model runs. The calibrated values are italicized in the table. The parameter definitions are as follows:

- soqc – surface outflow
- iogc – inflow concentrations

Table 5-7 LSPC Calibrated Fecal Coliform Parameter Values

LUID	soqc		ioqc	
	def	cal	def	cal
1	6,600	*1,550,000*	6,600	*1,550,000*
2	19,000	*1,550,000*	19,000	*1,550,000.*
3	19,000	*1,550,000*	19,000	*1,550,000*
4	6,600	*1,700,000*	6,600	*1,700,000*
5	40,000	*1,740,000*	40,000	*1,740,000*
6	2,300	*173,000*	2,300	*173,000*
7	2,300	*911,000*	2,300	*911,000*
8	1,000	*419,000*	1,000	*419,000*
9	1,000	*419,000*	1,000	*419,000*
10	3,500	*6,310*	3,500	*6,310*
11	3,500	*6,310*	3,500	*6,310*

Table 5-7 LSPC Calibrated Fecal Coliform Parameter Values				
LUID	**soqc**		**ioqc**	
	def	**cal**	**def**	**cal**
12	91,000	*60,300*	91,000	*60,300*
13	91,000	*60,300*	91,000	*60,300*
14	1,000	*6,310*	1,000	*6,310*
15	1,000	*6,310*	1,000	*6,310*
16	1,000	*6,310*	1,000	*6,310*
17	1,000	*6,310*	1,000	*6,310*
18	1,000	*6,310*	1,000	*6,310*
19	1,000	*6,310*	1,000	*6,310*
20	0	0	0	0
21	3,500	*3,500*	3,500	*3,500*

LUID = Land Use Identification (defined in **Table 5-1**)

The default values for both soqc and ioqc are identical for each LUID and were calibrated with identical values. **Table 5-8** and **Figure 5-6** summarize the statistical data associated with the calibrated model (SIM) as compared to the recorded values (OBS) for fecal coliform. The RAA Guidelines do not specify the modal calibration criteria for bacteria, but it can be assumed the calibration would fall into very good as the percent difference is less than ten percent.

Table 5-8 Fecal Coliform Parameter Statistics			
Parameter	**Root Mean Square (RMSE)**	**Linear Bias**	**Coefficient of Correlation (C.C.)**
Fecal Coliform	595,054	-0.04	0.49

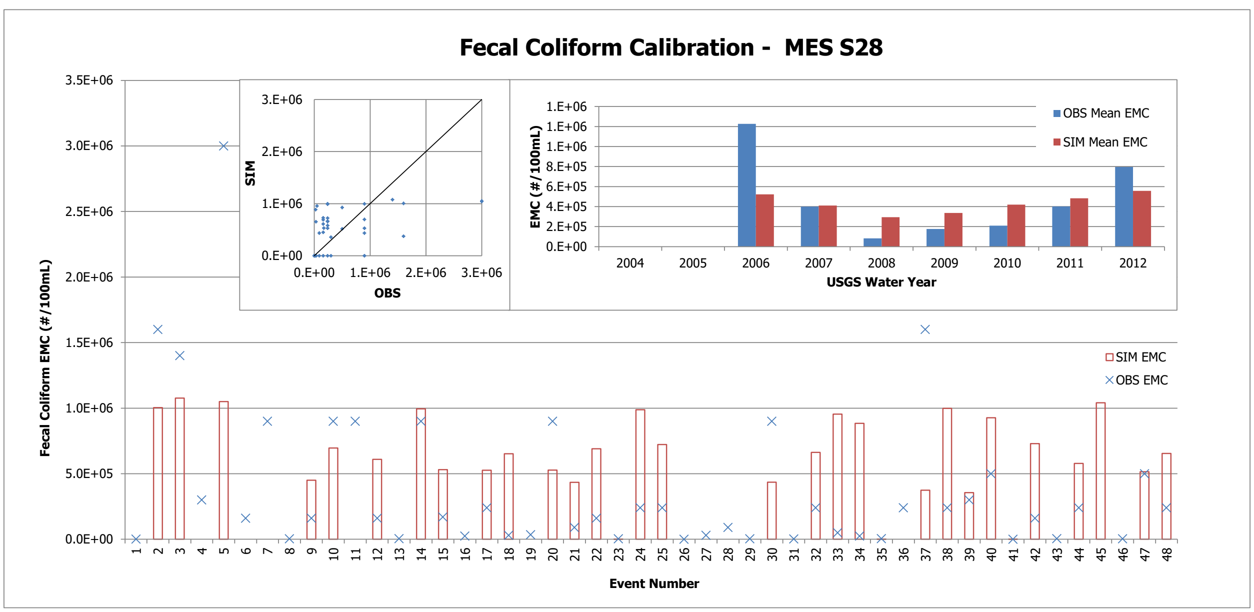

Figure 5-6 Fecal Coliform Calibration Statistics at MES S28

5.2.4 Total Nitrogen and Total Phosphorus Parameter Calibration

The LSPC model for general water quality parameter (GQUAL) uses total nitrogen and total phosphorous to assess the nutrient related impairments. The model set-up for the DC WMG RAA has 12 individual modeling parameters for each of the general water quality parameters, four of which were selected as calibration parameters. **Table 5-9** and **Table 5-10** summarize the calibration parameters including their default values (def) and calibration values (cal) used in the model runs. The calibrated values are italicized in the table. The parameter definitions are as follows:

- potfw – washoff potency factor
- potfs – scour potency factor
- soqc – surface outflow
- iogc – inflow concentrations

Table 5-9 LSPC Calibrated Total Nitrogen Parameters

LUID	potfw		potfs		soqc		ioqc	
	def	cal	def	cal	def	cal	def	cal
1	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
2	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
3	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
4	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
5	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
6	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
7	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
8	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
9	0	*72.9725*	0	*0.1292*	2	*0*	2	*0*
10	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
11	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
12	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
13	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
14	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
15	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
16	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
17	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
18	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
19	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
20	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*
21	0	*21.7046*	0	*0.1292*	2	*0*	2	*0*

LUID = Land Use Identification (defined in **Table 5-1**)

Table 5-10 LSPC Calibrated Total Phosphorus Parameters								
LUID	potfw		potfs		soqc		ioqc	
	def	cal	def	cal	def	cal	def	cal
1	0.01	*72.97*	0.01	*0.1291*	1.90	*0.01*	1.90	*0*
2	0.01	*72.97*	0.01	*0.1291*	1.08	*0.01*	1.08	*0*
3	0.01	*72.97*	0.01	*0.1291*	1.08	*0.01*	1.08	*0*
4	0.01	*72.97*	0.01	*0.1291*	1.90	*0.01*	1.90	*0*
5	0.01	*72.97*	0.01	*0.1291*	3.00	*0.01*	3.00	*0*
6	0.01	*72.97*	0.01	*0.1291*	1.26	*0.01*	1.26	*0*
7	0.01	*72.97*	0.01	*0.1291*	1.26	*0.01*	1.26	*0*
8	0.01	*72.97*	0.01	*0.1291*	1.00	*0.01*	1.00	*0*
9	0.01	*72.97*	0.01	*0.1291*	1.00	*0.01*	1.00	*0*
10	0.01	*21.70*	0.01	*0.1291*	1.08	*0.00*	1.08	*0*
11	0.01	*21.70*	0.01	*0.1291*	1.08	*0.00*	1.08	*0*
12	0.01	*21.70*	0.01	*0.1291*	1.76	*0.00*	1.76	*0*
13	0.01	*21.70*	0.01	*0.1291*	1.76	*0.00*	1.76	*0*
14	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*
15	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*
16	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*
17	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*
18	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*
19	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*
20	0.01	*21.70*	0.01	*0.1291*	0.00	0.00	0.00	0
21	0.01	*21.70*	0.01	*0.1291*	1.00	*0.00*	1.00	*0*

LUID = Land Use Identification (defined in **Table 5-1**)

The surface outflow quality concentrations for total nitrogen and total phosphorus were modified for impervious surfaces and were kept to zero for the interflow parameters. **Table 5-11**, **Figure 5-7**, and **Figure 5-8** summarize the statistical data associated with the calibrated model (SIM) as compared to the recorded values (OBS) for total nitrogen and total phosphorus. The RAA Guidelines do not specify the modal calibration criteria for these pollutants, but it can be assumed the calibration would rank very good for total nitrogen as the percent differences are less than ten percent and very good for total phosphorus as the percent differences are less than ten.

Table 5-11 Total Nitrogen and Total Phosphorus Parameter Statistics			
Parameter	Root Mean Square (RMSE)	Linear Bias	Coefficient of Correlation (C.C.)
Total Nitrogen	6.06	0.03	0.28
Total Phosphorus	0.57	-0.02	0.24

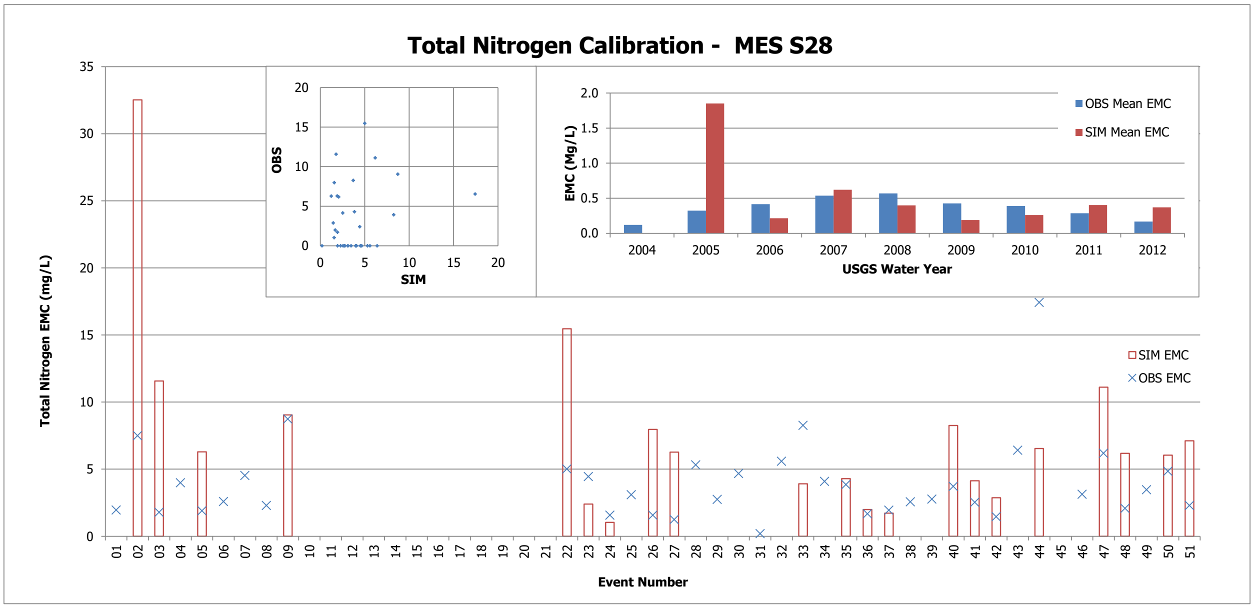

Figure 5-7 Total Nitrogen Calibration Statistics at MES S28

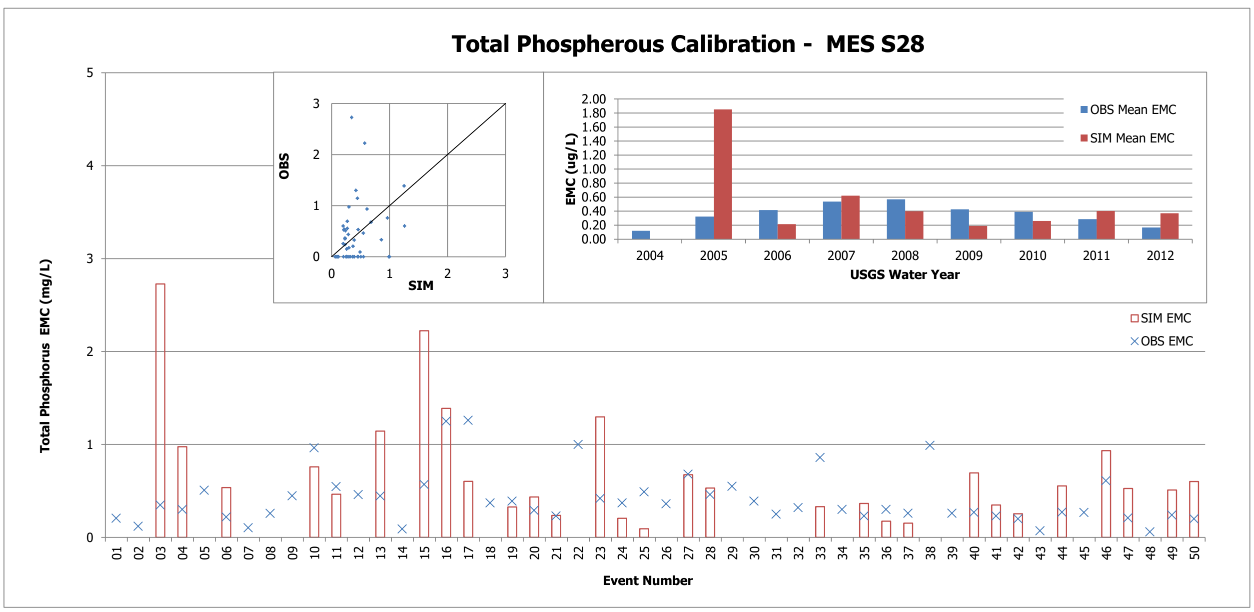

Figure 5-8 Total Phosphorus Calibration Statistics at MES S28

5.2.5 Relationships for Other Constituents of Concern

As discussed above, the model parameters for the major pollutants with current TMDLs have been developed using LSPC. Other relationships for pollutants of concern were evaluated to see if relationships could be found with the other constituents analyzed. The constituents evaluated include: oil and grease, pH, cadmium, arsenic, and dissolved oxygen. No relationships were found with strong correlation to the other water quality constituents. However, these constituents have lower concentrations in the flows in Dominguez Channel. It is assumed that by capturing the limiting pollutants described in Section 3.3.5 of the EWMP, these other constituents will be accounted for. Legacy pollutants such as DDT and organophosphates had too many non-detects to establish any type of relationship and are expected to be associated mainly with sediments already deposited in the estuary or with Superfund sites already under mitigation operations. The analyses of these other pollutants of concern are provided in **Attachment A**.

6. LSPC Validation

After the model was calibrated it was validated. During the calibration effort, hydrology, sediment, and general water quality parameters were varied to develop a best fit of HRU/EMC responses. The validation effort evaluated responses at tributary stations (TS) where the record is not long enough to be used for calibration, but may be used to evaluate performance of the model by comparing simulated model results with the observed record at each TS. The tributary stations are located at the following locations, all within LACFCD facilities:

- TS 19: Reinforced concrete rectangular channel at Figueroa Street, south of Del Amo Boulevard
- TS 20: Del Amo Channel - reinforced concrete trapezoidal channel at Avalon Boulevard
- TS 21: Reinforced concrete rectangular channel near 173rd Street and Merit Avenue
- TS 22: Hollypark Drain - reinforced concrete rectangular channel at 135th Street
- TS 23: Yukon Lateral - reinforced concrete rectangular channel at Crenshaw Boulevard
- TS 24: Dominguez Channel - reinforced concrete box near 116th Street and Isis Avenue

The validation effort used simulated model results of the general water quality constituents – TSS, copper, lead, zinc, fecal coliform, total nitrogen, and total phosphorus, and compared them to the observed records at TS19 - 24. **Figure 6-1** shows the location of Tributary Stations and MES - S28 used in calibration and validation. The figure also identifies the rain gages used for calibration. The value of the constituents is based on EMCs.

Table 6-1 through **Table 6-7** summarize the observed (OBS) versus simulated (SIM) constituent concentrations used for model validation. For illustration purposes, the water quality constituent will be examined on an annual mean basis in the following tables. The complete set of the validation results are included in **Attachment B**.

Validation of the baseline condition at the various temporary stations has bias numbers that reflect the lack of long term records and the potential issue of the EMC of observed samples not being representative of the event pollutograph during collection. It is expected that as more data is collected through CIMP efforts, the calibration of the model may be refined for areas tributary to the TS locations.

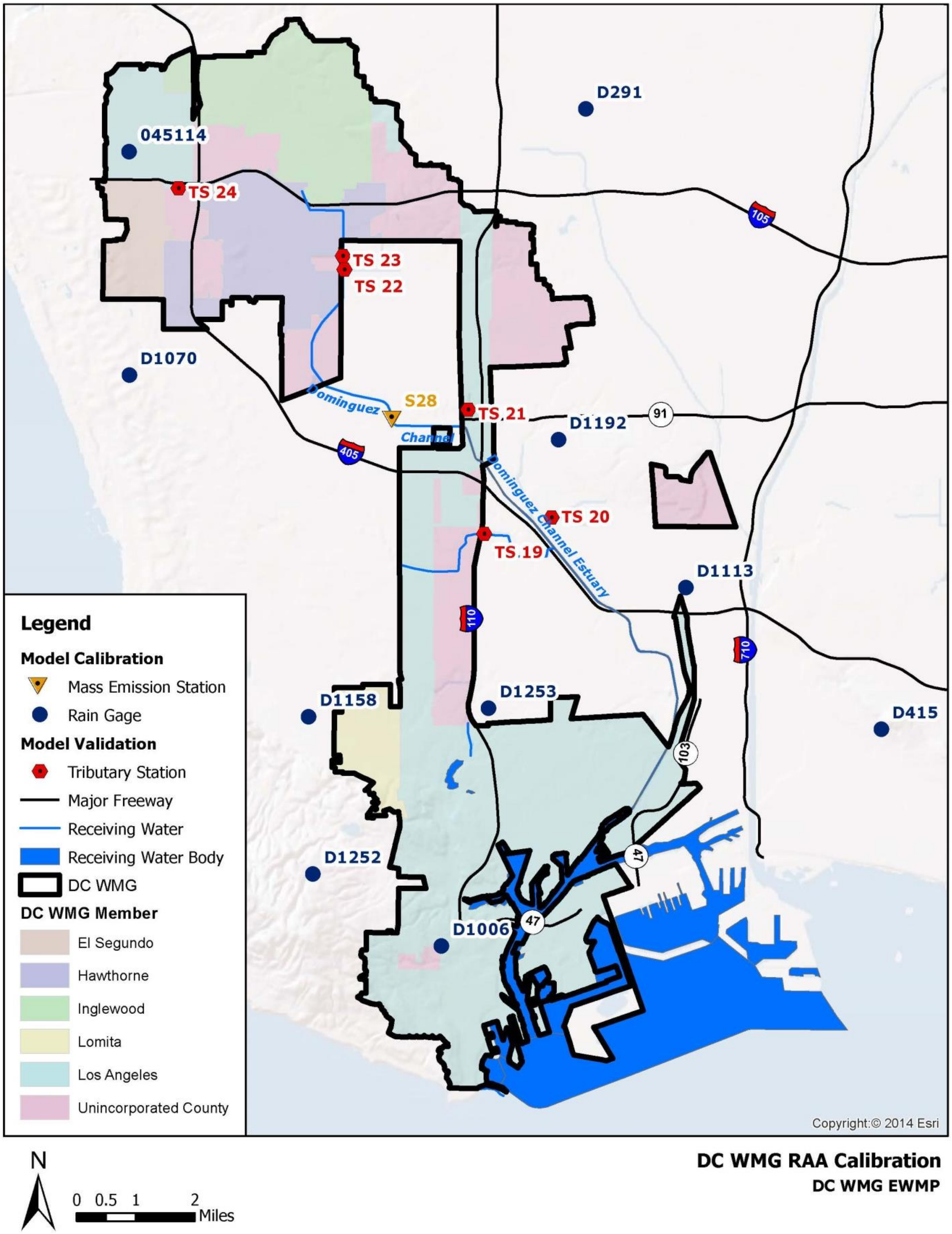

Figure 6-1 Monitoring Stations for Calibration and Validation

Table 6-1 Annual Mean Concentration - TSS (mg/L)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	200	88	147	91	101	142	-28.35%
20	109	82	175	88	102	95	-31.35%
21	180	82	183	88	373	99	-63.45%
22	125	85	202	95	154	117	-38.25%
23	47	82	78	80	87	105	25.94%
24	65	80	114	78	40	96	15.98%

Table 6-2 Annual Mean Concentration - Copper (µg/L)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	50.82	46.66	28.66	41.66	77.50	92.58	7.38%
20	45.72	51.65	41.11	43.78	180.00	141.07	4.70%
21	54.10	49.00	39.25	41.28	136.00	102.39	-17.47%
22	35.38	50.59	26.15	51.25	92.43	98.28	44.03%
23	28.36	61.47	35.79	42.27	101.25	132.21	73.01%
24	68.23	61.45	121.61	45.03	72.88	73.61	-33.96%

Table 6-3 Annual Mean Concentration - Lead (µg/L)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	20.18	8.38	11.97	7.84	16.32	29.40	-5.89%
20	5.42	9.48	9.53	7.81	23.33	25.39	11.45%
21	27.83	8.59	19.07	7.02	30.93	15.44	-60.11%
22	9.51	9.53	11.02	10.63	34.93	19.30	-28.82%
23	7.35	12.75	12.45	8.71	22.16	21.46	2.32%
24	9.30	12.44	16.51	9.23	10.84	17.07	5.69%

Table 6-4 Annual Mean Concentration - Zinc (µg/L)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	308.28	169.00	172.84	147.62	309.91	253.83	-27.89%
20	118.46	180.06	174.51	148.41	262.90	288.94	11.07%
21	346.45	172.94	272.00	141.26	340.29	272.80	-38.77%
22	143.70	170.07	121.26	185.70	262.91	281.13	20.65%
23	122.72	213.31	167.56	146.00	264.41	303.57	19.50%
24	263.43	210.40	600.00	155.40	265.51	192.10	-50.58%

Table 6-5 Annual Mean Concentration – Fecal Coliform (MPN/100 mL)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	129,978	710,015	198,188	809,375	207,214	1,222,387	4.10
20	16,182	518,065	63,563	578,962	130,757	873,616	9.05
21	29,819	655,259	178,213	723,640	2,353,000	1,101,086	0.10
22	16,145	279,573	52,190	459,325	95,133	703,465	8.30
23	22,341	286,298	71,163	449,882	611,067	551,333	1.19
24	4,217	297,585	38,160	559,261	46,617	471,424	15.50

Table 6-6 Annual Mean Concentration – Total Nitrogen (mg/L)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	3.16	2.33	2.23	2.38	2.97	4.87	-4.91%
20	2.38	2.48	2.82	1.80	4.94	5.13	-7.99%
21	3.78	2.53	4.36	2.47	5.40	5.89	-23.55%
22	124.90	85.35	201.63	94.92	153.88	117.43	-35.56%
23	1.85	2.91	2.74	3.14	6.91	5.48	9.89%
24	3.91	2.46	5.69	1.77	3.45	2.57	-47.71%

Table 6-7 Annual Mean Concentration – Total Phosphorus (mg/L)

TS #	Water Year						Bias
	2008		2009		2010		
	OBS	SIM	OBS	SIM	OBS	SIM	
19	0.54	0.24	0.36	0.18	0.33	0.42	-36.80%
20	0.32	0.21	0.39	0.16	0.18	0.44	-19.46%
21	0.60	0.21	0.55	0.16	0.33	0.44	-51.25%
22	0.46	0.46	0.42	0.42	0.25	0.59	-22.74%
23	0.32	0.27	0.43	0.15	0.36	0.42	-27.38%
24	0.44	0.23	0.63	0.16	0.20	0.26	-53.77%

7. Baseline Simulation

A baseline analysis was performed as part of the DC WMG RAA which represents the current watershed condition based on existing stormwater programs. Stormwater runoff was simulated based on the time series record of rainfall between October 2002 and September 2012. This period represents the most recent 10 years of record as required by the MS4 Permit. The water quality constituent mass loading is determined by multiplying the stormwater runoff volume by the water quality constituent concentration. As part of the baseline analysis, the industrial permitted and other permitted facilities were identified. These facilities are modeled as compliant, meaning the parcels did not contribute to the flow, volume, or constituent loading, as they are covered under a stormwater permit and not regulated by the jurisdiction in which they are located. These facilities are illustrated and listed in Attachment M of the EWMP.

The baseline and subsequent simulations analyzed the DC WMG area based on five distinct watersheds, each tributary to different receiving waters. The five watersheds include the Dominguez Channel, Dominguez Channel Estuary, Wilmington Drain, Machado Lake, and the Harbor. These watersheds are shown in **Figure 7-1**. The baseline simulation and 90th percentile analysis were performed for each of the watersheds.

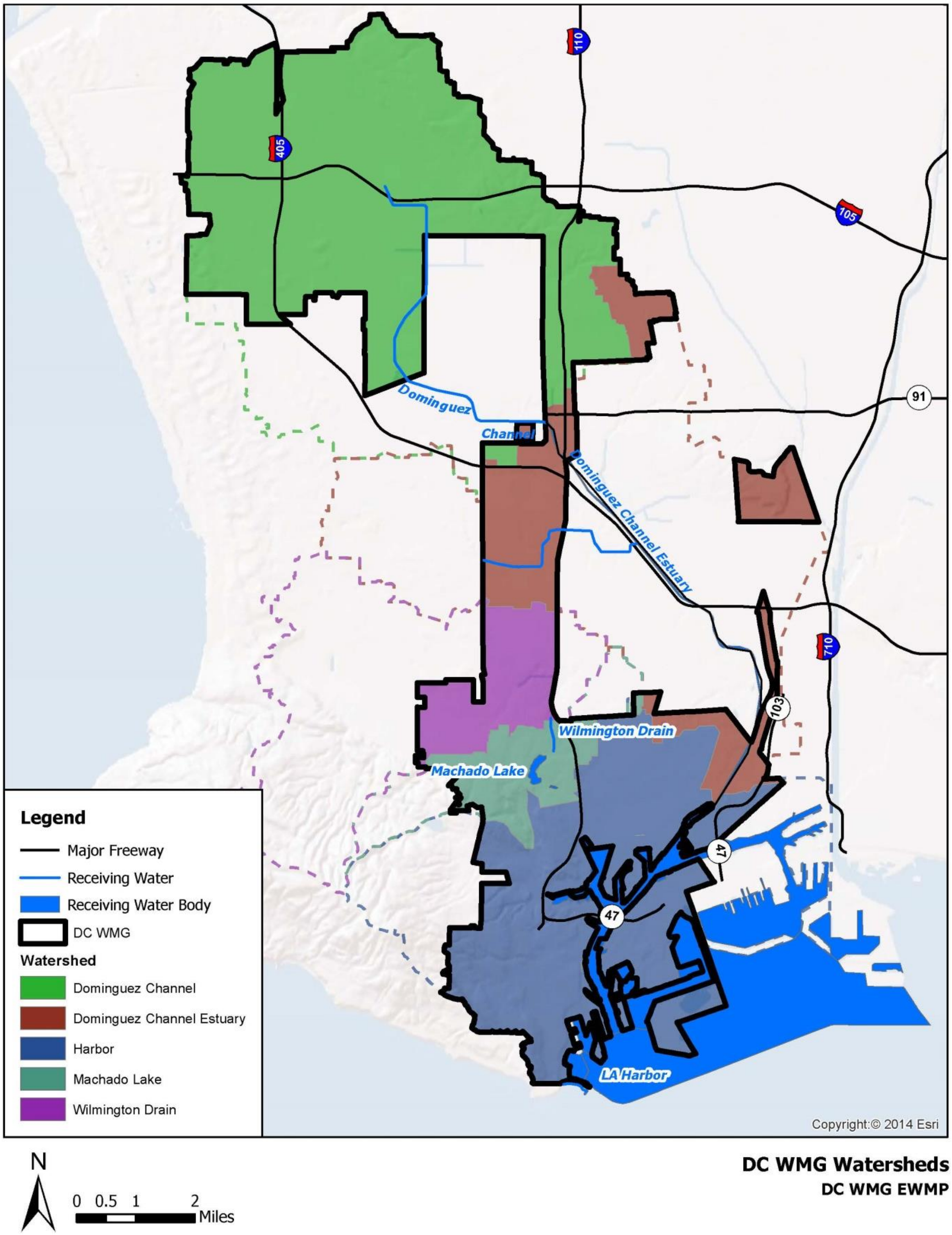

Figure 7-1 DC WMG Watersheds

The baseline hydrology and simulated constituent loading serves as the basis for compliance. The load reductions represent the difference between the baseline conditions and the water quality objectives. The 85th percentile, 24-hour rainfall event baseline simulation is based on the LACFCD 85th percentile rainfall isohyets and unit hyetograph, consistent with the Standard Urban Stormwater Mitigation Plan (SUSMP) and Low Impact Development (LID) methods used within the County. The loads for this event are generated by the model. The volume of runoff for capture under this criterion is determined from the LSPC output to be 1,523 acre-feet.

The 90th percentile load baseline is determined from the 2002-2012 water years based on the loads generated before any BMPs are implemented. This analysis was performed for each of the five watersheds. **Table 7-1** through **Table 7-5** summarizes the results of the LSPC simulation of the load analysis for each of the watersheds. The tables demonstrate that the 90th percentile load exceeds the WQO for most constituents with associated TMDLs. The objective loads are the final target for the simulated constituents. Total nitrogen and total phosphorus are included in the 90th percentile load analysis for the Wilmington Drain and Machado Lake Watersheds, as these are pollutants of concern in these watersheds and not the others based on the Machado Lake Nutrients TMDL.

Table 7-1 Dominguez Channel Watershed – 90th Percentile Baseline Load Analysis

Constituent	Storm Event	P_{90} Load (kg)	Objective Load (kg)	Objective Conc.
Copper	1/21/2012	92.97	5.03	9.7 µg/L
Lead	1/21/2012	24.55	22.16	42.7 µg/L
Zinc	12/16/2002	351.61	61.62	69.6 µg/L
Fecal Coliform	10/30/2010	1.94E+15 MPN	6.76E+11 MPN	400 MPN/100mL

Table 7-2 Dominguez Channel Estuary Watershed – 90th Percentile Baseline Load Analysis

Constituent	Storm Event	P_{90} Load (kg)	Objective Load (kg)	Objective Conc.
Copper	2/27/2006	35.10	2.64	9.7 µg/L
Lead	1/21/2012	7.23	6.95	42.7 µg/L
Zinc	2/27/2006	164.34	18.95	69.6 µg/L
Fecal Coliform	10/30/2010	1.24E+15 MPN	2.50E+11 MPN	400 MPN/100mL

Table 7-3 Wilmington Drain Watershed – 90th Percentile Baseline Load Analysis

Constituent	Storm Event	P_{90} Load (kg)	Objective Load (kg)	Objective Conc.
Copper	12/7/2009	16.93	1.09	9.7 µg/L
Lead	4/12/2010	3.70	3.20	42.7 µg/L
Zinc	12/17/2010	54.96	9.67	69.6 µg/L
Fecal Coliform	10/14/2004	5.84E+14 MPN	1.29E+11 MPN	235 MPN/100mL
Nitrogen	12/17/2010	918.93	138.87	1.0 mg/L
Phosphorus	4/12/2010	83.20	7.49	0.1 mg/L

Table 7-4 Machado Lake Watershed – 90th Percentile Baseline Load Analysis				
Constituent	**Storm Event**	**P_{90} Load (kg)**	**Objective Load (kg)**	**Objective Conc.**
Copper	2/18/2005	9.24	0.59	9.7 µg/L
Lead	10/14/2004	1.89	1.25	42.7 µg/L
Zinc	12/31/2005	30.33	5.98	69.6 µg/L
Fecal Coliform	2/21/2011	2.70E+14 MPN	7.03E+10 MPN	235 MPN/100mL
Nitrogen	12/31/2005	563.84	85.98	1.0 mg/L
Phosphorus	4/12/2010	52.78	5.10	0.1 mg/L

Table 7-5 Harbor Watershed – 90th Percentile Baseline Load Analysis				
Constituent	**Storm Event**	**P_{90} Load (kg)**	**Objective Load (kg)**	**Objective Conc.**
Copper	3/25/2012	64.88	7.05	9.7 µg/L
Lead	10/17/2005	12.91	7.93	42.7 µg/L
Zinc	12/23/2003	241.31	44.32	69.6 µg/L
Fecal Coliform	12/31/2003	3.60E+15 MPN	6.75E+11 MPN	400 MPN/100mL

Table 7-6 through **Table 7-10** summarize the results of the LSPC simulation for the water years beginning the first day of October and ending the final day of September from 2002 to 2012 for each of the five major watersheds. The table compares the six major water quality constituents with adopted TMDLs and identifies the annual load and corresponding volume for each year analyzed. The average annual loads are also provided for the simulation period.

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Table 7-6 Dominguez Channel Watershed – Annual Loads and Volume							
Start	**End**	**Volume (ac-ft)**	**TSS (kg)**	**Copper (kg)**	**Lead (kg)**	**Zinc (kg)**	**Fecal Coliform (MPN)**
10/1/02	9/30/03	10,785.64	1,653,025.57	692.82	162.88	2,697.80	1.06E+17
10/1/03	9/30/04	8,224.93	1,217,251.86	578.41	132.83	2,215.55	6.84E+16
10/1/04	9/30/05	23,889.84	3,590,190.72	1,066.94	205.39	3,168.54	2.65E+17
10/1/05	9/30/06	8,721.22	1,488,277.84	730.87	173.42	2,871.92	7.51E+16
10/1/06	9/30/07	3,586.61	426,006.76	377.42	79.68	1,359.38	8.21E+15
10/1/07	9/30/08	10,589.63	1,336,606.77	561.38	126.51	2,106.17	1.03E+17
10/1/08	9/30/09	8,139.89	1,147,055.49	550.43	125.58	2,099.04	6.87E+16
10/1/09	9/30/10	10,885.81	1,602,439.10	689.04	162.07	2,690.55	1.05E+17
10/1/10	9/30/11	15,477.34	1,952,793.20	721.63	168.11	2,778.03	1.64E+17
10/1/11	9/30/12	7,236.76	1,369,686.88	740.79	175.86	2,914.19	5.68E+16
Average Annual:		**10,753.77**	**1,578,333.42**	**670.97**	**151.23**	**2,490.12**	**1.02E+17**

Table 7-7 Dominguez Channel Estuary Watershed – Annual Loads and Volume							
Start	**End**	**Volume (ac-ft)**	**TSS (kg)**	**Copper (kg)**	**Lead (kg)**	**Zinc (kg)**	**Fecal Coliform (MPN)**
10/1/02	9/30/03	4,861.77	694,715.88	243.97	49.86	1,021.84	8.73E+16
10/1/03	9/30/04	3,135.93	420,958.55	187.35	36.81	750.84	4.48E+16
10/1/04	9/30/05	9,952.87	1,162,293.46	273.30	54.21	1,092.27	2.01E+17
10/1/05	9/30/06	3,222.85	499,614.41	223.42	44.96	920.85	4.74E+16
10/1/06	9/30/07	1,421.54	179,264.43	138.18	25.40	524.27	5.69E+15
10/1/07	9/30/08	4,522.77	584,767.06	204.65	40.64	831.22	7.80E+16
10/1/08	9/30/09	3,818.80	476,251.09	182.00	35.25	722.60	6.17E+16
10/1/09	9/30/10	5,292.34	770,497.66	256.92	51.29	1,043.02	9.51E+16
10/1/10	9/30/11	6,780.96	901,271.36	310.72	58.11	1,144.16	1.28E+17
10/1/11	9/30/12	2,898.58	546,749.57	253.16	51.75	1,059.08	3.99E+16
Average Annual:		**4,590.84**	**623,638.35**	**227.37**	**44.83**	**911.01**	**7.89E+16**

Table 7-8 Wilmington Drain Watershed – Annual Loads and Volume									
Start	**End**	**Volume (ac-ft)**	**TSS (kg)**	**Copper (kg)**	**Lead (kg)**	**Zinc (kg)**	**Fecal Coliform (MPN)**	**Total Nitrogen (kg)**	**Total Phosphorus (kg)**
10/1/02	9/30/03	2,009.77	339,107.92	127.24	28.13	448.19	1.75E+16	9,025.56	859.23
10/1/03	9/30/04	1,215.21	157,036.98	74.13	16.42	272.96	8.32E+15	5,979.13	563.85
10/1/04	9/30/05	3,754.98	834,479.83	285.77	48.19	684.59	3.53E+16	14,654.85	1,626.27
10/1/05	9/30/06	1,336.46	203,415.91	99.31	23.27	382.06	9.69E+15	7,788.94	715.67
10/1/06	9/30/07	712.80	159,474.41	102.05	24.03	393.97	2.48E+15	7,999.65	725.93
10/1/07	9/30/08	1,815.29	208,272.28	78.56	17.64	292.34	1.53E+16	6,302.86	597.77
10/1/08	9/30/09	1,432.70	187,697.17	79.57	17.71	292.41	1.08E+16	6,309.17	596.37
10/1/09	9/30/10	2,367.94	380,187.83	132.97	28.43	449.50	2.10E+16	9,192.61	892.44
10/1/10	9/30/11	2,547.68	331,262.56	115.65	27.49	448.20	2.37E+16	8,907.66	825.72
10/1/11	9/30/12	1,156.48	206,660.51	112.37	26.82	437.70	7.64E+15	8,715.54	791.20
Average Annual:		**1,834.93**	**300,759.54**	**120.76**	**25.81**	**410.19**	**1.52E+16**	**8,487.60**	**819.45**

Table 7-9 Machado Lake Watershed – Annual Loads and Volume									
Start	**End**	**Volume (ac-ft)**	**TSS (kg)**	**Copper (kg)**	**Lead (kg)**	**Zinc (kg)**	**Fecal Coliform (MPN)**	**Total Nitrogen (kg)**	**Total Phosphorus (kg)**
10/1/02	9/30/03	1,565.22	349,726.31	133.03	22.61	341.45	1.38E+16	7,712.97	822.70
10/1/03	9/30/04	918.20	110,541.16	52.93	10.94	189.36	6.16E+15	4,461.29	426.00
10/1/04	9/30/05	2,637.23	532,556.39	174.83	28.44	419.75	2.55E+16	9,520.55	1,049.75
10/1/05	9/30/06	991.32	156,228.00	74.53	16.77	283.85	7.05E+15	6,059.23	559.14
10/1/06	9/30/07	556.30	110,719.45	69.93	15.43	264.93	1.71E+15	5,786.09	531.16
10/1/07	9/30/08	1,327.33	152,887.64	57.00	11.92	205.09	1.12E+16	4,741.95	455.44
10/1/08	9/30/09	1,007.99	126,020.52	57.63	12.26	210.27	7.33E+15	4,802.14	454.95
10/1/09	9/30/10	1,814.18	347,631.37	124.90	21.73	333.03	1.64E+16	7,524.73	794.25
10/1/10	9/30/11	2,014.21	282,987.89	92.06	19.64	325.00	1.91E+16	6,909.76	663.20
10/1/11	9/30/12	801.67	124,080.47	65.66	14.23	246.89	4.84E+15	5,502.40	510.54
Average Annual:		**1,363.37**	**229,337.92**	**90.25**	**17.40**	**281.96**	**1.13E+16**	**6,302.11**	**626.71**

Table 7-10 Harbor Watershed – Annual Loads and Volume

Start	End	Volume (ac-ft)	TSS (kg)	Copper (kg)	Lead (kg)	Zinc (kg)	Fecal Coliform (MPN)
10/1/02	9/30/03	12,003.98	2,095,957.03	571.09	93.62	2,081.62	2.32E+17
10/1/03	9/30/04	6,825.41	1,034,047.48	339.14	58.63	1,406.83	1.07E+17
10/1/04	9/30/05	20,160.47	3,033,366.45	657.76	108.45	2,401.93	4.12E+17
10/1/05	9/30/06	6,749.71	1,342,996.20	456.18	82.43	1,989.55	1.04E+17
10/1/06	9/30/07	3,719.28	967,491.79	418.54	75.46	1,796.73	3.26E+16
10/1/07	9/30/08	10,945.49	1,500,407.62	385.57	62.98	1,434.51	2.05E+17
10/1/08	9/30/09	6,174.41	958,435.33	333.54	57.78	1,376.68	8.89E+16
10/1/09	9/30/10	13,643.10	2,721,003.99	781.23	114.38	2,288.11	2.62E+17
10/1/10	9/30/11	14,501.56	2,744,594.68	756.12	116.18	2,435.63	2.83E+17
10/1/11	9/30/12	5,062.31	1,047,431.77	403.57	71.95	1,726.03	6.31E+16
Average Annual:		**9,978.57**	**1,744,573.23**	**510.27**	**84.19**	**1,893.76**	**1.79E+17**

8. Limiting Pollutant Evaluation

The limiting pollutant idea is the concept that if the WBPC that requires the largest load reduction and associated treatment capacity to meet WQBELs and RWLs is captured and treated, all other constituents will be addressed. Meeting all of the WQBELs and RWLs in the DC WMG can be achieved through control of the limiting pollutant. The limiting pollutant in the DC WMG will be determined based on the largest volume of treatment required to capture and infiltrate the 90th percentile load since the DC WMG will implement only infiltration BMPs. The limiting pollutant will control implementation actions and will dictate the volume the control measures must address.

The limiting pollutant was evaluated for each of the five analyzed watersheds. The limiting pollutant is the pollutant with the highest volume associated with the 90th percentile load. By addressing this volume, the 90th percentile load will be addressed for all pollutants. The results of the 90th percentile constituent loads are presented in Table 8-1 through Table 8-5 for each of the watersheds. The volume associated with zinc is the highest for the Dominguez Channel Watershed; therefore zinc is the limiting pollutant. For the Dominguez Channel Estuary, the volume associated with both copper and zinc are the highest, however, copper loads are expected to reduce over fifty percent due to SB 346; therefore zinc was chosen as the limiting pollutant. SB 346 requires incremental reductions in the amount of copper in vehicle brake pads. SB 346 requires most brake pads sold in California to contain less than five percent copper by weight after January 1, 2021. For the Wilmington Drain Watershed, the volume associated with zinc and nitrogen are the greatest; however, zinc is not a priority pollutant as it is not identified as a category 1, 2, or 3 WBPC (as discussed in Section 2). Therefore, nitrogen is the limiting pollutant for the Wilmington Drain Watershed. The volumes associated with zinc and nitrogen are the greatest in the Machado Lake Watershed, however, similar to Wilmington Drain Watershed, zinc is not a category 1, 2, or 3 WBPC. Additionally, nitrogen is expected to be addressed through the Machado Lake Ecosystem Rehabilitation Project discussed below. Copper and phosphorus have the next greatest volumes, but they are also not categorized WBPCs in the Machado Lake watershed; therefore fecal coliform is the limiting pollutant, as it has been identified as a category 3 WBPC in Machado Lake. Lastly, for the Harbor Watershed, copper has the greatest volume followed by zinc. As previously stated, significant copper load reductions are anticipated due to SB 346; therefore zinc is the limiting pollutant. The stormwater volume used for demonstrating compliance is associated with the limiting pollutants identified for each of the watersheds. Mitigating the limiting pollutant means that all other constituents will also be mitigated, as the required volume reductions are less than that associated with the limiting pollutant.

The limiting pollutant for the Wilmington Drain and Machado Lake Watersheds are based on the category 2 and 3 WBPCs identified in Section 2, which are based on 303(d) listings and observed exceedances. The limiting pollutant was not determined based on the Machado Lake Toxics and Nutrients TMDLs, as these TMDLs will be addressed by the Machado Lake Ecosystem Rehabilitation Project. The City of Los Angeles is leading the project that will be under construction in 2015. The project includes dredging the lake to remove accumulated sediments and constructing a pipeline that will discharge highly treated recycled water into the lake to offset evapotranspiration at a cost over $100 million. The treated water that will be added to the lake will dilute the stormwater stored in the lake and lower the concentration of all pollutants, including nutrients (nitrogen) and toxics (zinc). If necessary, the entire volume of water in the lake could be replaced with the reclaimed water within 30 days to meet the TMDL requirements for nutrients. Replacement would result in dilution of water with elevated levels of constituents with treated water.

The loads in DC WMG are influenced by both the flow volume and the constituent concentrations. A large storm with low concentrations may create a load equal to a small storm with high concentrations. The 87th through 93rd percentile events for zinc were evaluated to estimate the statistical range of volumes and loads at the model outlet to see which events produced regional rainfall and volumes for the watershed resulting in this load. Table 8-1, Table 8-3, Table 8-5, Table 8-7 and Table 8-9 show the events analyzed and the range in volumes, concentrations, and loads for events with loads of approximately the same magnitude as the 90th percentile load event for each of the five analyzed watersheds. The bold values in the table show the numerically selected 90th percentile load. The tables below are presented for zinc and for all other pollutants in **Error! Reference source not found.**. Statistical analysis of the data shown in the percentile load event tables are the basis for the data shown in Table 8-2, Table 8-4, Table 8-6, Table 8-8 and Table 8-10. These tables include statistical values for both loads and volumes which were used in selecting the final modeled storm event for analysis of the 90th percentile load for permit compliance evaluation.

Table 8-1: Dominguez Channel Watershed – Zinc Percentile Loads and Storm Events

Date	Flow (cfs)	Volume (ac-ft)	Concentration (µg/l)	Lead Load (kg)
4/12/2010	237.20	470.48	716.77	415.72
9/22/2007	86.62	171.81	1910.75	404.70
1/21/2012	212.20	420.90	767.35	398.15
12/28/2004	1559.54	3093.31	100.01	381.37
1/18/2010	332.66	659.82	461.51	375.39
12/16/2002	**362.08**	**718.17**	**397.15**	**351.61**
2/11/2003	213.08	422.63	669.17	348.64
5/22/2006	149.49	296.50	941.96	344.30
11/26/2008	343.78	681.88	401.68	337.65
11/6/2011	99.65	197.65	1315.56	320.54
2/27/2006	282.68	560.68	450.53	311.40

Table 8-2: Dominguez Channel Watershed – Zinc Percentile Load Statistics

Statistical Analysis	Volume (ac-ft)	Zinc Load (kg)
Mean	699.44	362.68
Standard Error	245.90	10.46
Median	470.48	351.61
Standard Deviation	815.55	34.69
Sample Variance	665,125.16	1,203.72
Kurtosis	9.52	-1.21
Skewness	3.00	0.12
Range	2,921.49	104.32
Minimum	171.81	311.40
Maximum	3,093.31	415.72
95% Confidence Range for Mean	963.92	41.01

Table 8-3: Dominguez Channel Estuary – Zinc Percentile Loads and Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Zinc Load (kg)**
3/17/2012	49.56	98.31	1414.74	171.45
10/13/2007	54.05	107.21	1292.39	170.8
12/25/2003	100.43	199.21	673.97	165.51
4/12/2010	99.88	198.11	675.31	164.92
2/27/2006	**111.35**	**220.86**	**603.59**	**164.34**
5/22/2006	72.22	143.25	874.65	154.45
12/28/2004	326.94	648.49	191.28	152.91
1/21/2012	66.56	132.02	911.48	148.34
2/5/2009	71.71	142.23	824.4	144.54

Table 8-4: Dominguez Channel Estuary – Zinc Percentile Load Statistics		
Statistical Analysis	**Volume (ac-ft)**	**Zinc Load (kg)**
Mean	209.96	159.7
Standard Error	56.62	3.28
Median	143.25	164.34
Standard Deviation	169.86	9.85
Sample Variance	28,851.97	97.05
Kurtosis	7.44	-1.47
Skewness	2.65	-0.33
Range	550.18	26.91
Minimum	98.31	144.54
Maximum	648.49	171.45
95% Confidence Range for Mean	221.95	12.87

Table 8-5: Wilmington Drain Watershed – Nitrogen Percentile Loads and Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Nitrogen Load (kg)**
2/11/2003	194.83	386.44	2.53	1,204.68
12/27/2004	106.40	211.05	4.44	1,155.85
10/14/2004	22.48	44.58	19.85	1,090.73
12/12/2003	14.23	28.23	30.34	1,056.02
10/5/2011	15.23	30.21	27.70	1,031.86
4/12/2010	30.64	60.77	13.17	987.00
12/15/2002	73.72	146.22	5.21	939.74
12/17/2010	**56.80**	**112.65**	**6.62**	**918.93**

Table 8-6: Wilmington Drain Watershed – Nitrogen Percentile Load Statistics		
Statistical Analysis	**Volume (ac-ft)**	**Nitrogen Load (kg)**
Mean	127.52	1,048.10
Standard Error	43.35	35.46
Median	86.71	1,043.94
Standard Deviation	122.62	100.31
Sample Variance	15,035.41	10,061.55
Kurtosis	2.38	-0.94
Skewness	1.57	0.28
Range	358.21	285.75
Minimum	28.23	918.93
Maximum	386.44	1,204.68
95% Confidence Range for Mean	169.94	139.02

Table 8-7: Machado Lake Watershed – Fecal Coliform Percentile Loads and Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (MPN/100 mL)**	**Fecal Coliform Load (MPN)**
2/28/2011	13.74	27.26	905,009.24	3.04E+14
2/21/2011	**12.23**	**24.26**	**901,607.98**	**2.70E+14**
4/21/2005	8.50	16.86	1,211,501.63	2.52E+14
3/20/2005	8.77	17.40	1,157,856.24	2.48E+14

Table 8-8: Machado Lake Watershed – Fecal Coliform Percentile Load Statistics		
Statistical Analysis	**Volume (ac-ft)**	**Fecal Coliform Load (MPN)**
Mean	21.44	2.68E+14
Standard Error	2.57	1.28E+13
Median	20.83	2.61E+14
Standard Deviation	5.14	2.55E+13
Sample Variance	26.39	6.52E+26
Kurtosis	-4.32	1.06E+00
Skewness	0.28	1.30E+00
Range	10.41	5.58E+13
Minimum	16.86	2.48E+14
Maximum	27.26	3.04E+14
95% Confidence Range for Mean	10.07	5.01E+13

Table 8-9: Harbor Watershed – Zinc Percentile Loads and Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Zinc Load (kg)**
3/25/2012	297.39	589.85	441.07	320.72
12/15/2002	476.17	944.48	268.17	312.23
11/20/2011	171.78	340.72	721.76	303.15
10/17/2005	75.96	150.67	1577.85	293.07
2/19/2007	175.05	347.21	672.12	287.68
2/18/2011	115.47	229.04	938.95	265.11
12/23/2003	260.45	516.60	378.91	241.31
1/20/2010	1,176.45	2,333.45	81.12	233.36
1/18/2010	484.40	960.80	194.12	229.92
1/23/2012	152.28	302.05	610.3	227.24
5/18/2011	105.88	210.01	874.59	226.42
3/15/2003	1,143.71	2,268.52	79.31	221.78
12/1/2005	59.04	117.10	1442.49	208.23
3/28/2006	378.42	750.58	220.84	204.33
10/13/2007	177.21	351.49	460.84	199.68
3/20/2011	628.05	1245.72	128.7	197.64

Table 8-10: Harbor Watershed – Zinc Percentile Load Statistics		
Statistical Analysis	**Volume (ac-ft)**	**Zinc Load (kg)**
Mean	728.64	248.24
Standard Error	173.52	10.58
Median	434.05	231.64
Standard Deviation	694.07	42.33
Sample Variance	481,732.36	1,792.18
Kurtosis	1.79	-1.24
Skewness	1.60	0.53
Range	2,216.35	123.08
Minimum	117.10	197.64
Maximum	2,333.45	320.72
95% Confidence Range for Mean	680.19	41.49

The values in the tables show the relatively wide range of variability. Based on the results of the statistical analyses and engineering judgment, the bold storm event was chosen to represent the 90th percentile load event for each watershed. These events generally have loads and volumes up to 10 percent higher than the median statistical 90th percentile load, with a volume that is also up to 30 percent higher. The storm events that generated these volumes and loads were spatially consistent over the entire watershed. The values for volumes and loads generally fall well within the 95 percent confidence interval. The volume generated is also consistent with the 85th percentile 24-hour storm volume.

The storms that generated the 87th to 93rd percentile loads were evaluated to determine the pollutant load distribution throughout the storm hydrograph. Standard literature reviews and studies within the region show that pollutant load concentrations often follow a similar shape with the hydrograph, but lagging in time. An analysis of the hourly loads and volumes showed which hours of the storm exceeded pollutant load objectives. The percentage of the volume associated with these exceedances was determined for each storm. The average percentage of the volume required to capture all flows with concentrations exceeding the water quality objective concentrations. This volume was then used to determine the volume of treatment required within the watersheds. Table 8-11 shows the volume reduction percentages required to capture the 90th percentile loads in the five watersheds within the DC WMG. The tables showing the analysis of each watershed storm event are provided in **Attachment J**.

Table 8-11: Limiting Pollutant Percentile Load Statistics

Watershed	Percent Storm Volume Reduction	Limiting Pollutant Analyzed
Dominguez Channel	90	Zinc
Dominguez Channel Estuary	90	Zinc
Wilmington Drain	80	Total Nitrogen
Machado Lake	90	Fecal Coliform
Harbor	70	Zinc

The table shows the percentage of the storm volume on the date of the 90th percentile load event that would need to be captured to capture all of the flow that exceeded the water quality objective concentrations. The table shows that the range of volume capture ranged between 70 and 90 percent of the total storm volume. This is due to the nature of land use within the watersheds. The volumes were used to determine the volume of regional projects and green streets required for compliance with water quality objectives.

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Attachment A

Relationships for Other Constituents of Concern

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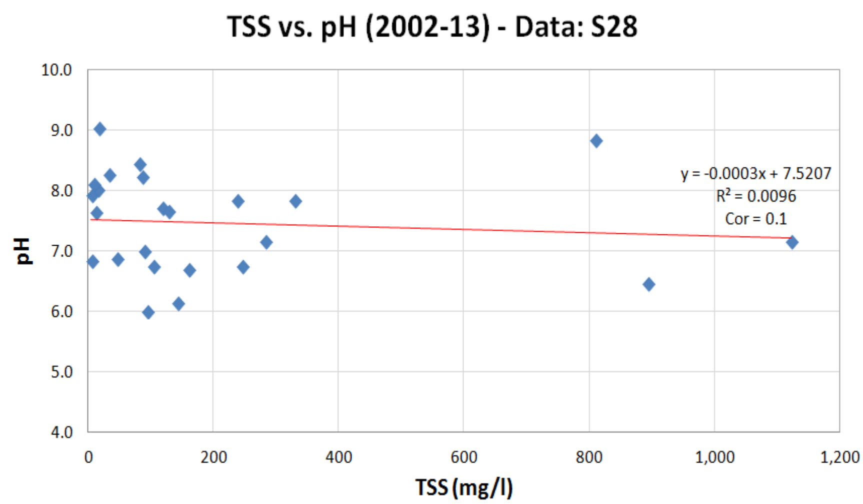
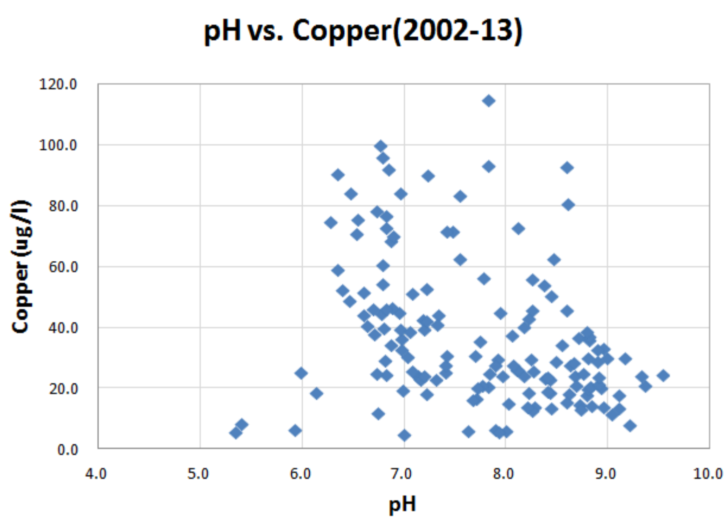


TSS vs. pH (2002-13) - Data: S28
10.0
9.0
8.0
7.0
6.0
5.0
4.0
pH
0
200
400
600
800
1,000
1,200
TSS (mg/l)
y = -0.0003x + 7.5207
R² = 0.0096
Cor = 0.1



pH vs. Copper(2002-13)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Copper (ug/l)
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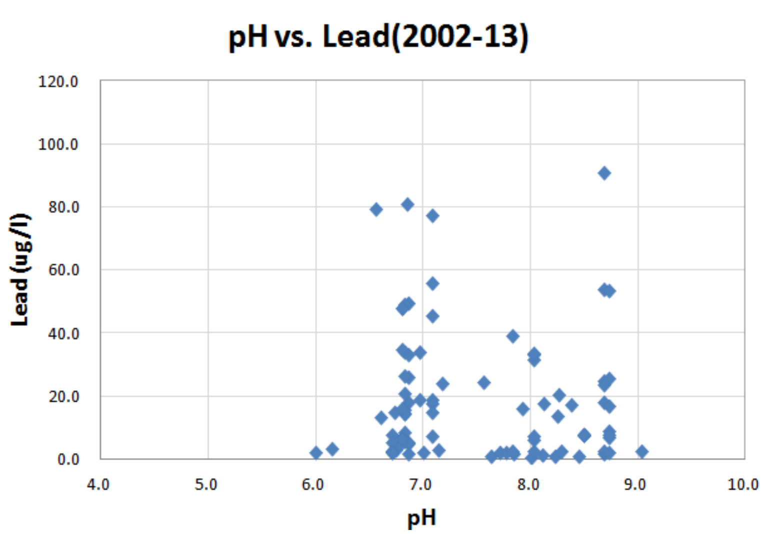
5.0
6.0
7.0
8.0
9.0
10.0
pH



pH vs. Lead(2002-13)
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80.0
60.0
40.0
20.0
0.0
Lead (ug/l)
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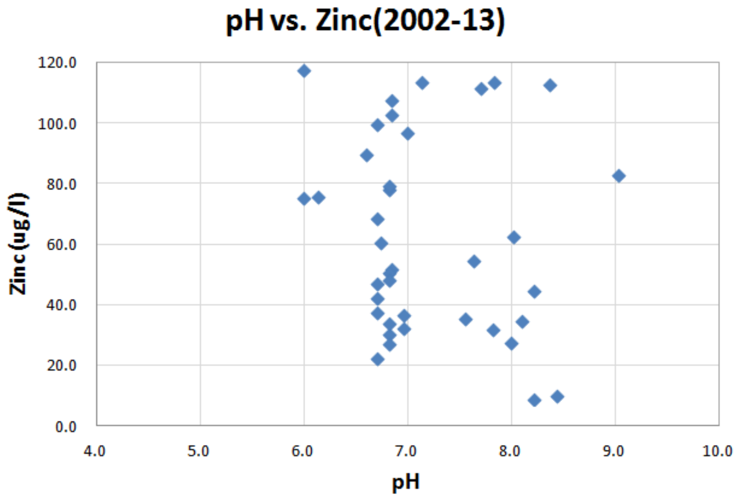
5.0
6.0
7.0
8.0
9.0
10.0
pH



pH vs. Zinc(2002-13)
Zinc (ug/l)
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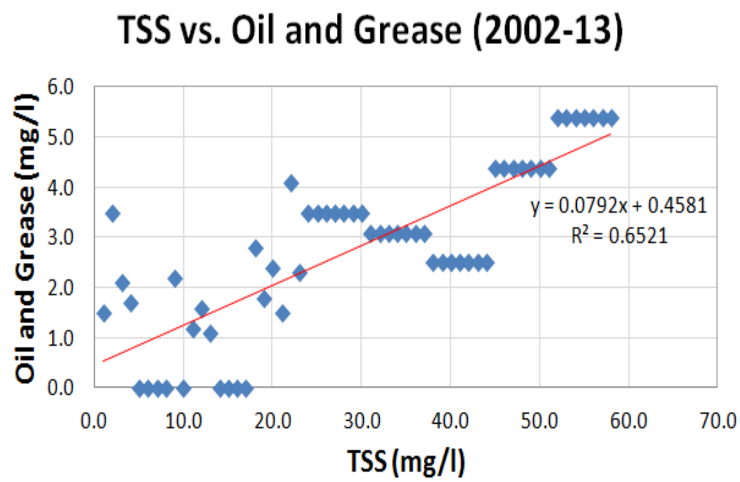
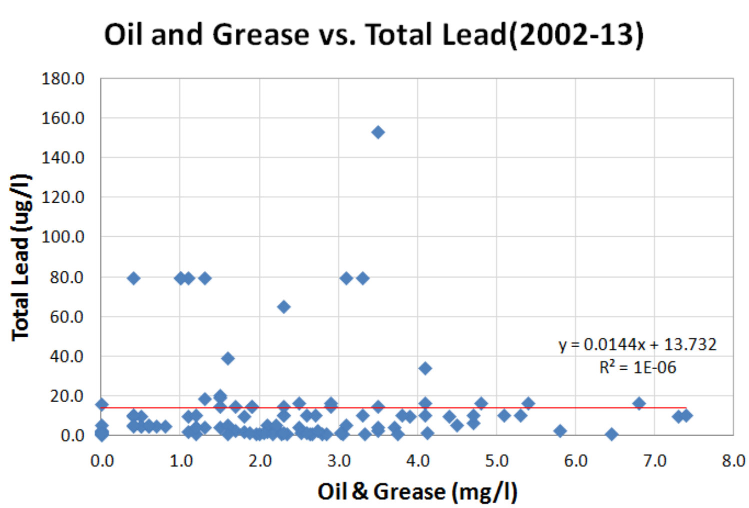
100.0
80.0
60.0
40.0
20.0
0.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
pH



TSS vs. Oil and Grease (2002-13)
Oil and Grease (mg/l)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
TSS (mg/l)
y = 0.0792x + 0.4581
R² = 0.6521



Oil and Grease vs. Total Lead(2002-13)
Total Lead (ug/l)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
Oil & Grease (mg/l)
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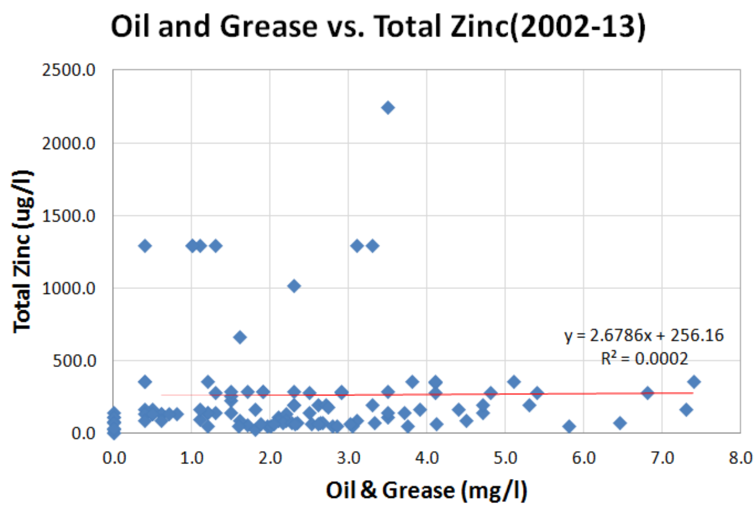
R² = 1E-06


Oil and Grease vs. Total Zinc(2002-13)
Total Zinc (ug/l)
Oil & Grease (mg/l)
y = 2.6786x + 256.16
R² = 0.0002
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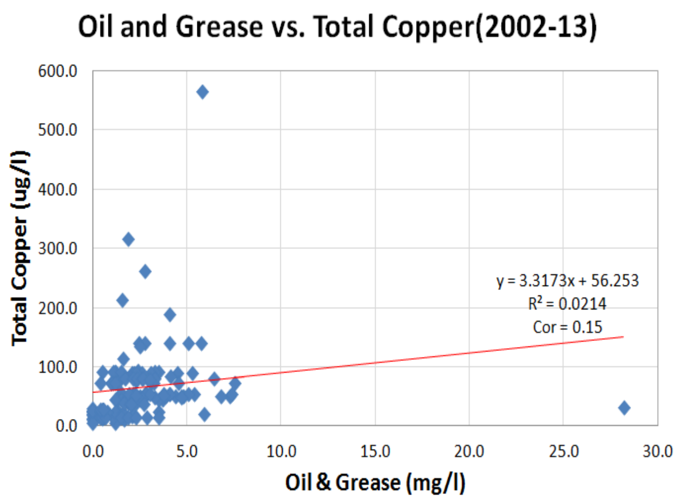
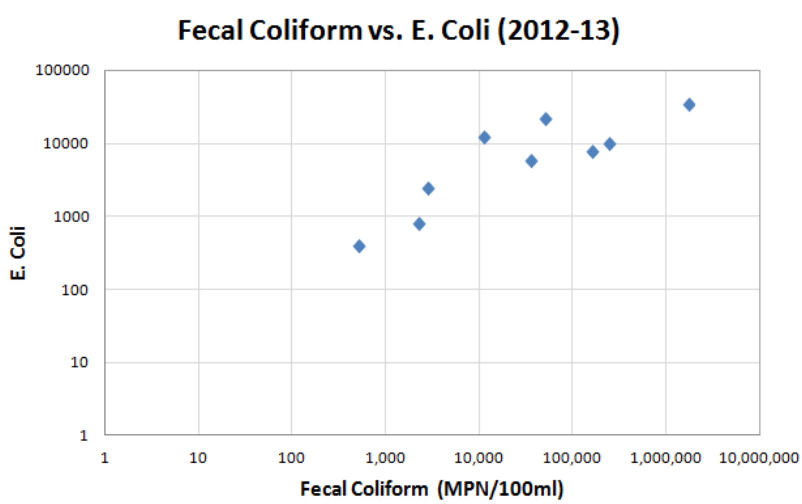
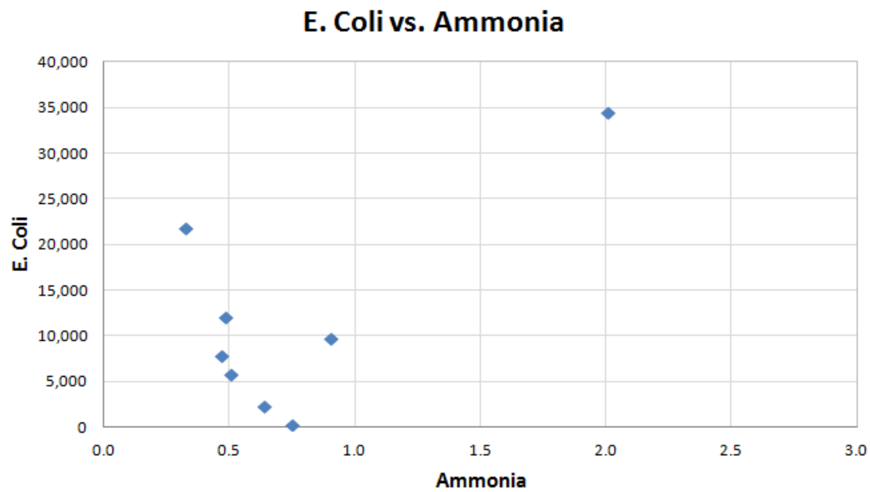
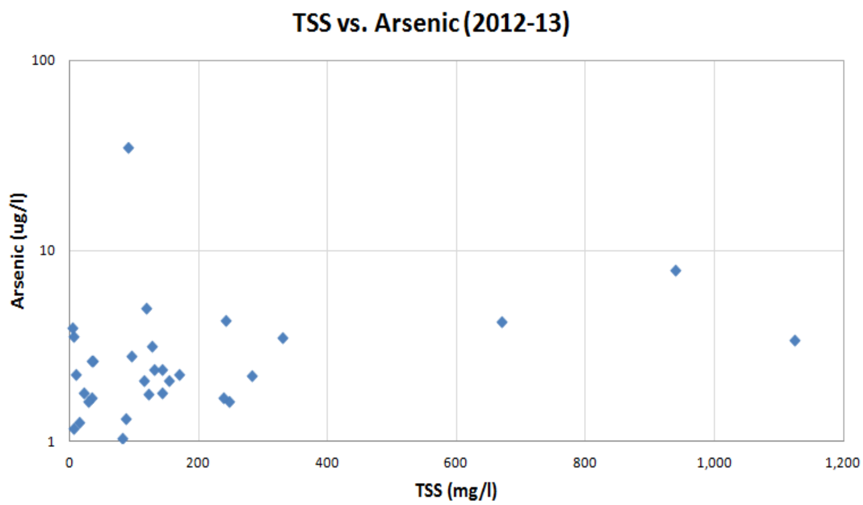
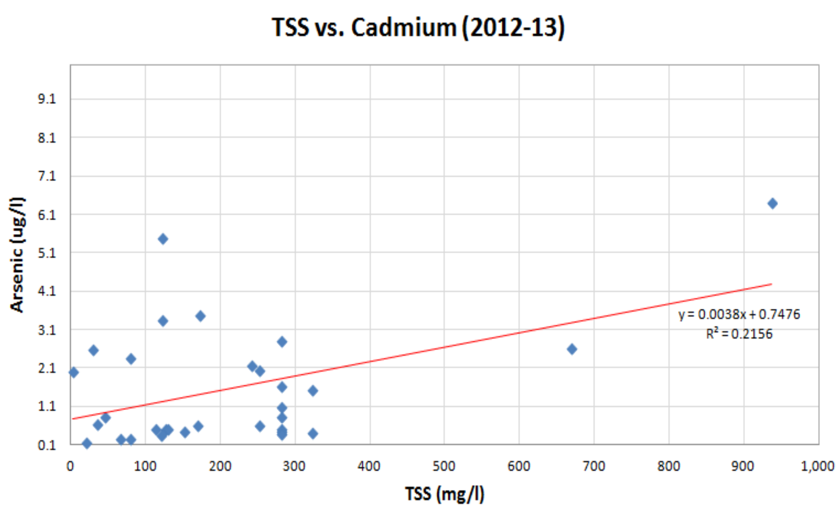
2000.0
1500.0
1000.0
500.0
0.0
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0

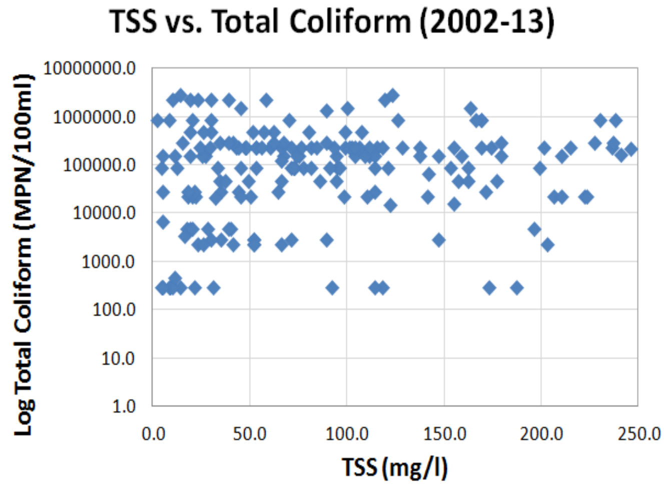

Oil and Grease vs. Total Copper(2002-13)
Total Copper (ug/l)
Oil & Grease (mg/l)
y = 3.3173x + 56.253
R² = 0.0214
Cor = 0.15
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.0 5.0 10.0 15.0 20.0 25.0 30.0

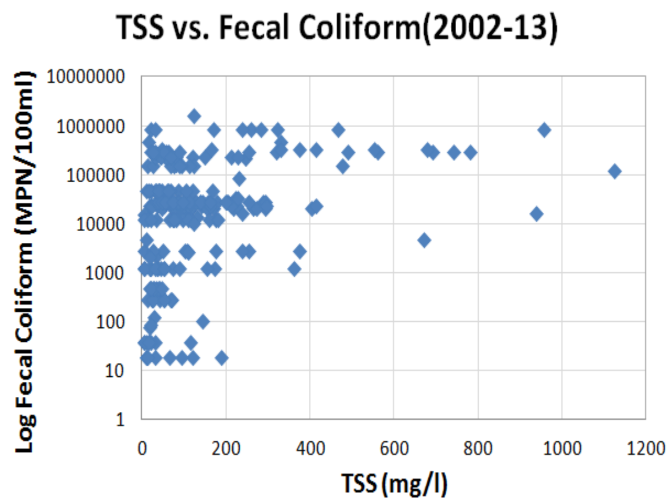

Fecal Coliform vs. E. Coli (2012-13)
E. Coli
Fecal Coliform (MPN/100ml)
100000
10000
1000
100
10
1
1 10 100 1,000 10,000 100,000 1,000,000 10,000,000

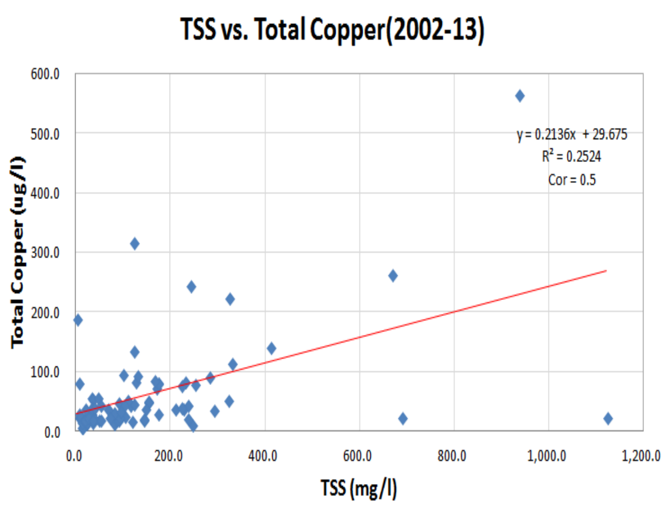

E. Coli vs. Ammonia
E. Coli
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Ammonia

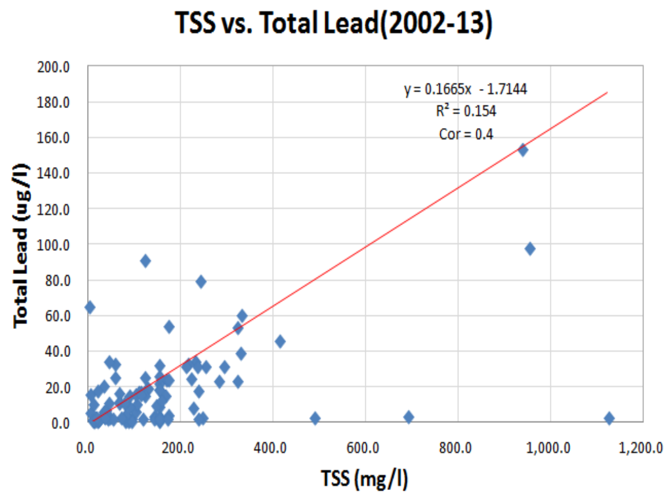

TSS vs. Arsenic (2012-13)
Arsenic (ug/l)
100
10
1
0
200
400
600
800
1,000
1,200
TSS (mg/l)

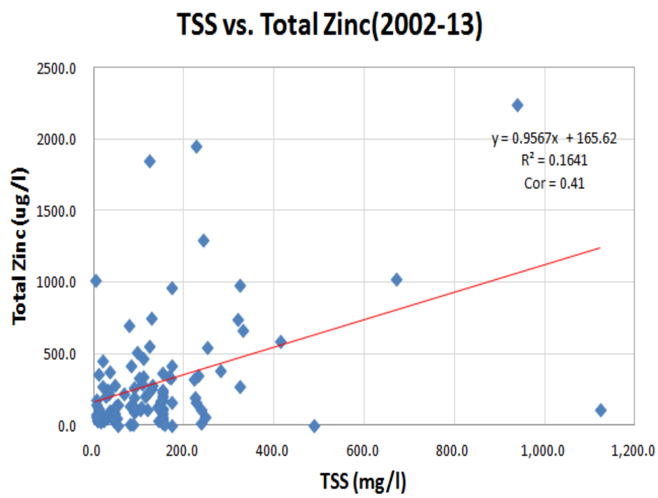

TSS vs. Cadmium (2012-13)
Arsenic (ug/l)
9.1
8.1
7.1
6.1
5.1
4.1
3.1
2.1
1.1
0.1
y = 0.0038x + 0.7476
R² = 0.2156
0
100
200
300
400
500
600
700
800
900
1,000
TSS (mg/l)

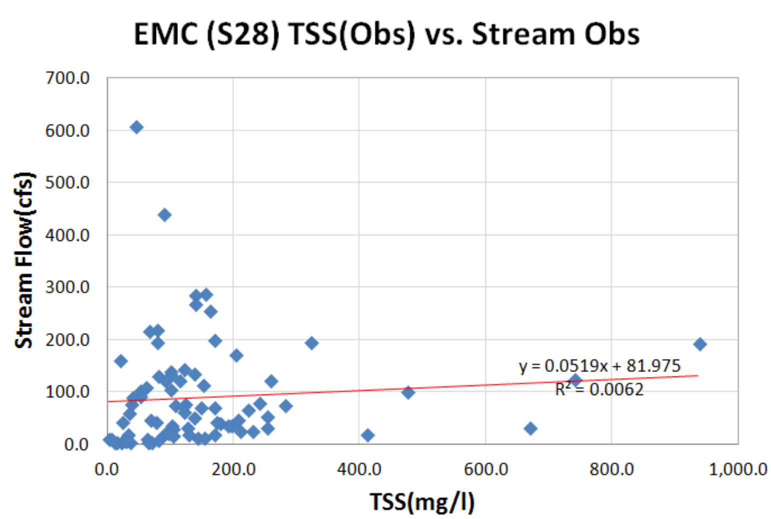

TSS vs. Total Coliform (2002-13)
Log Total Coliform (MPN/100ml)
10000000.0
1000000.0
100000.0
10000.0
1000.0
100.0
10.0
1.0
0.0
50.0
100.0
150.0
200.0
250.0
TSS (mg/l)

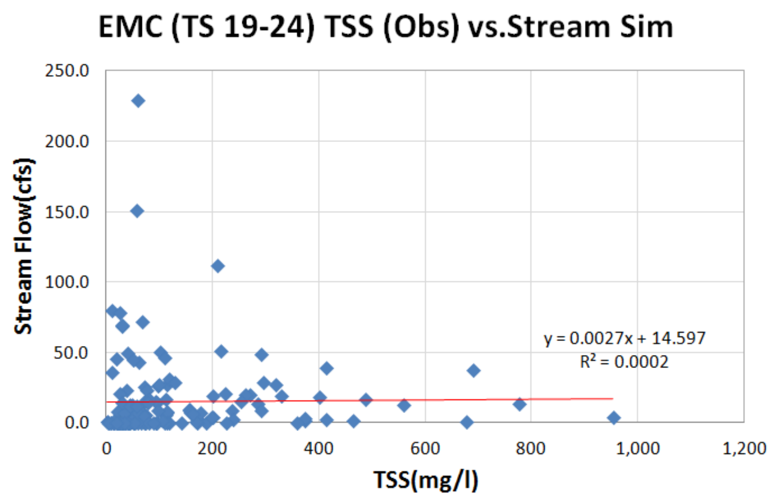

TSS vs. Fecal Coliform(2002-13)
Log Fecal Coliform (MPN/100ml)
10000000
1000000
100000
10000
1000
100
10
1
0
200
400
600
800
1000
1200
TSS (mg/l)


TSS vs. Total Copper(2002-13)
Total Copper (ug/l)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
y = 0.2136x + 29.675
R^2 = 0.2524
Cor = 0.5
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
TSS (mg/l)


TSS vs. Total Lead(2002-13)
y = 0.1665x - 1.7144
R² = 0.154
Cor = 0.4
Total Lead (ug/l)
TSS (mg/l)
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0


TSS vs. Total Zinc(2002-13)
y = 0.9567x + 165.62
R² = 0.1641
Cor = 0.41
Total Zinc (ug/l)
TSS (mg/l)
2500.0
2000.0
1500.0
1000.0
500.0
0.0
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0


EMC (S28) TSS(Obs) vs. Stream Obs
y = 0.0519x + 81.975
R² = 0.0062
Stream Flow(cfs)
TSS(mg/l)
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.0
200.0
400.0
600.0
800.0
1,000.0


EMC (TS 19-24) TSS (Obs) vs.Stream Sim
250.0
200.0
150.0
100.0
50.0
0.0
Stream Flow(cfs)
0
200
400
600
800
1,000
1,200
TSS(mg/l)
y = 0.0027x + 14.597
R² = 0.0002

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Attachment B

Validation Data Sets

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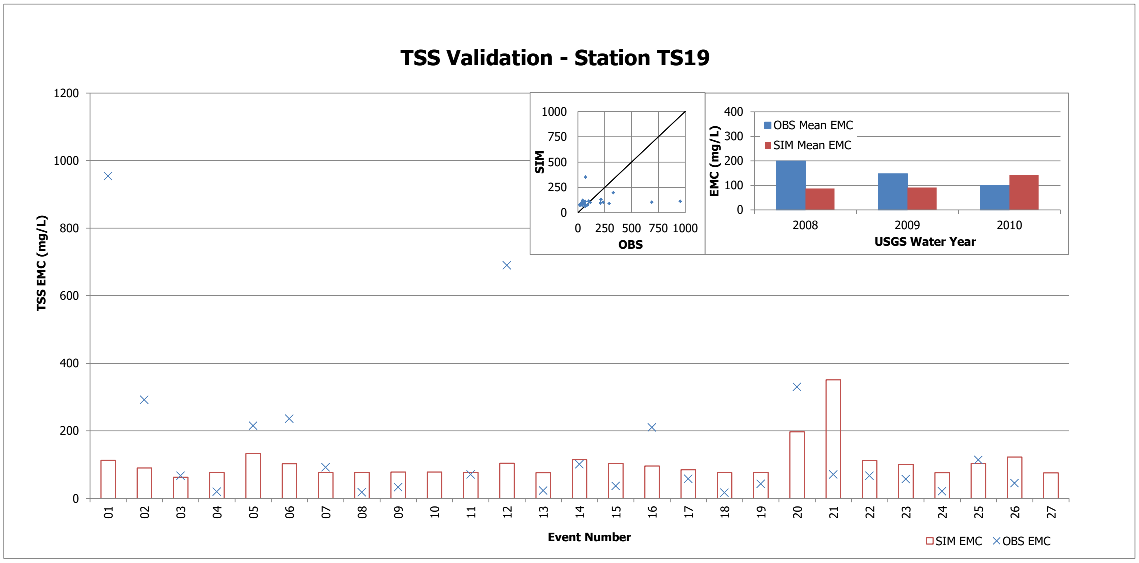
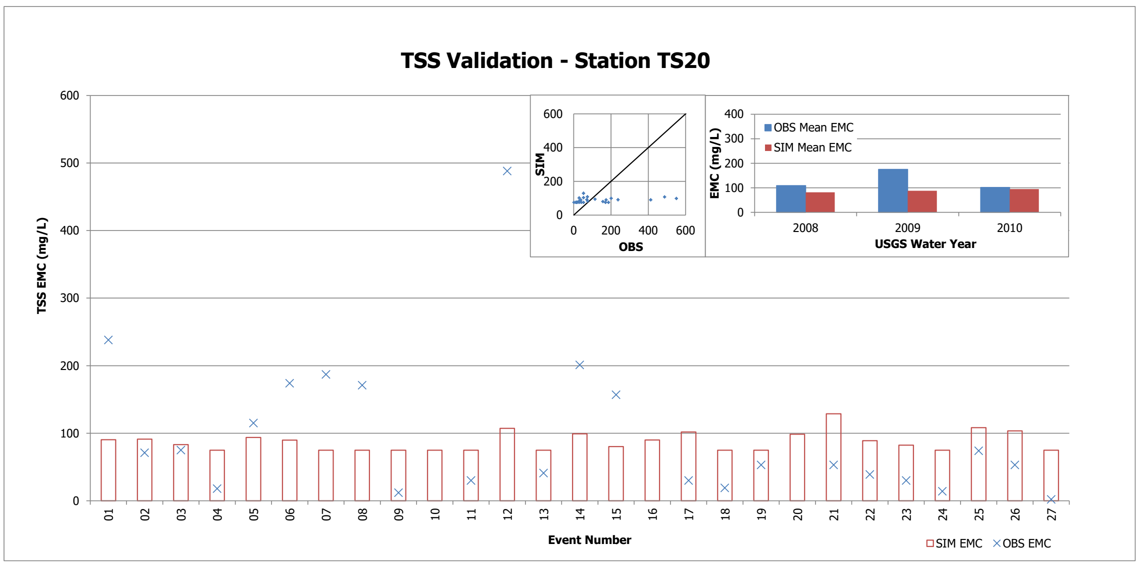
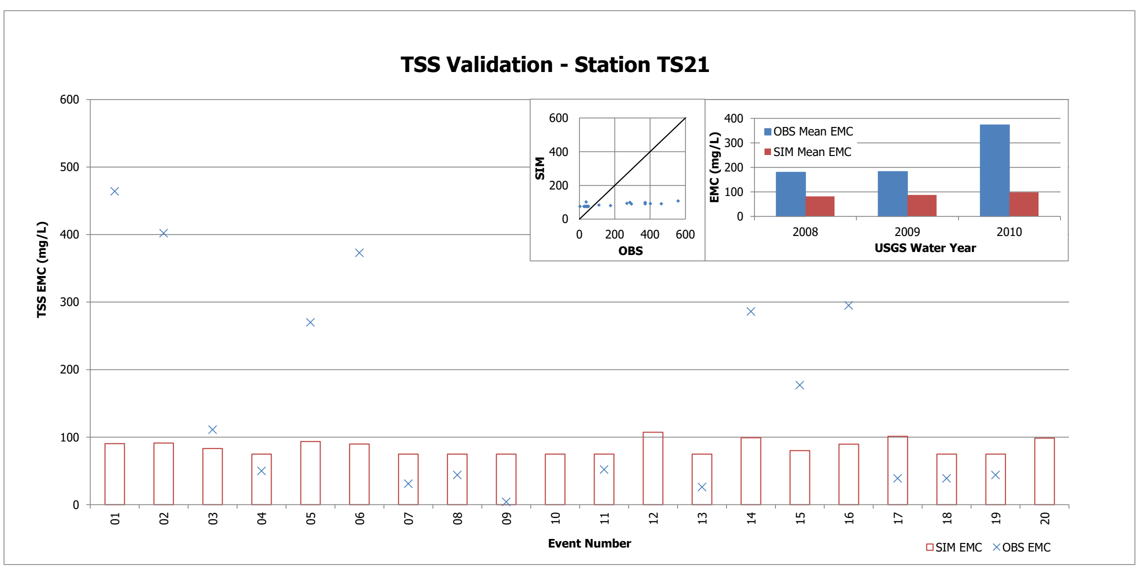
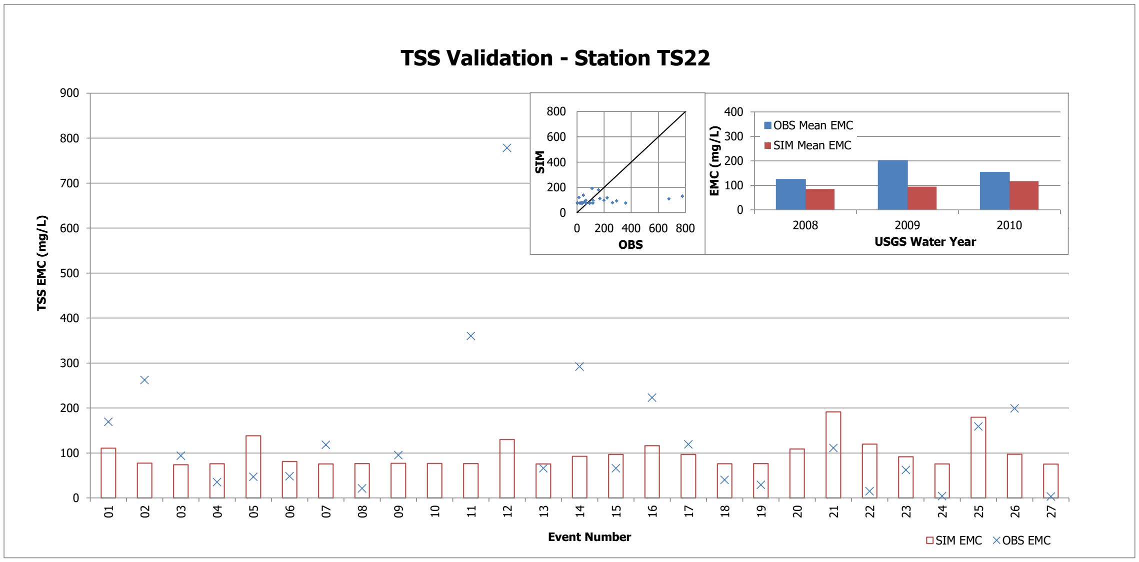
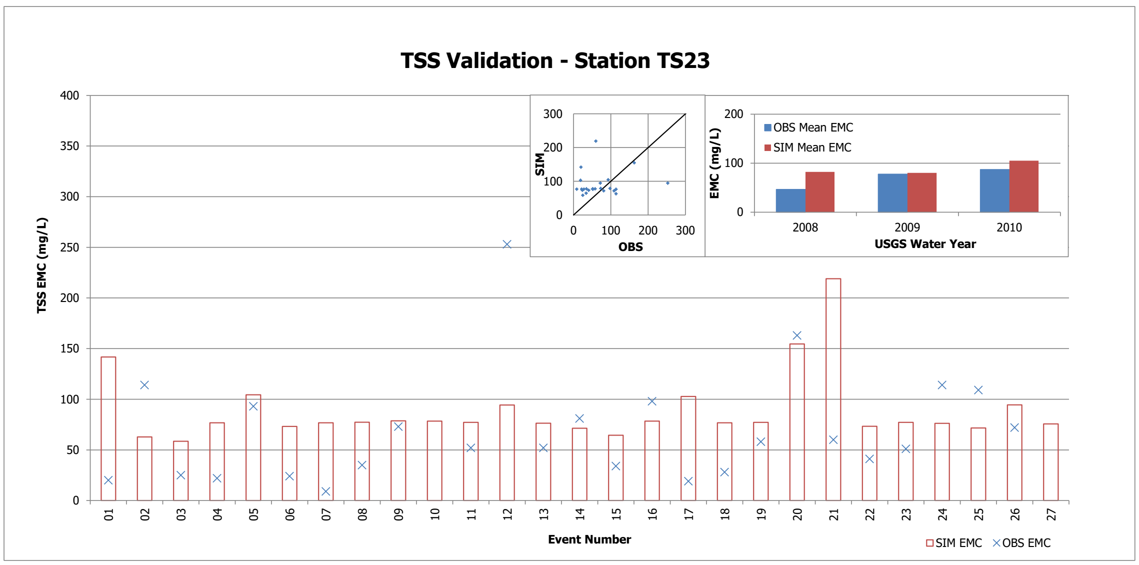
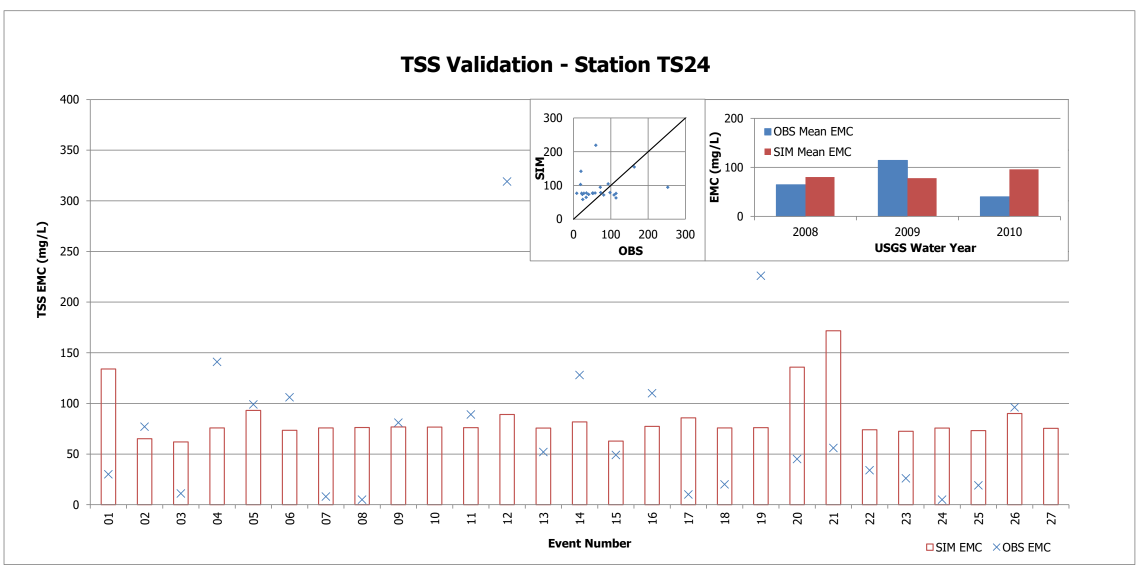

TSS Validation - Station TS19
TSS EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

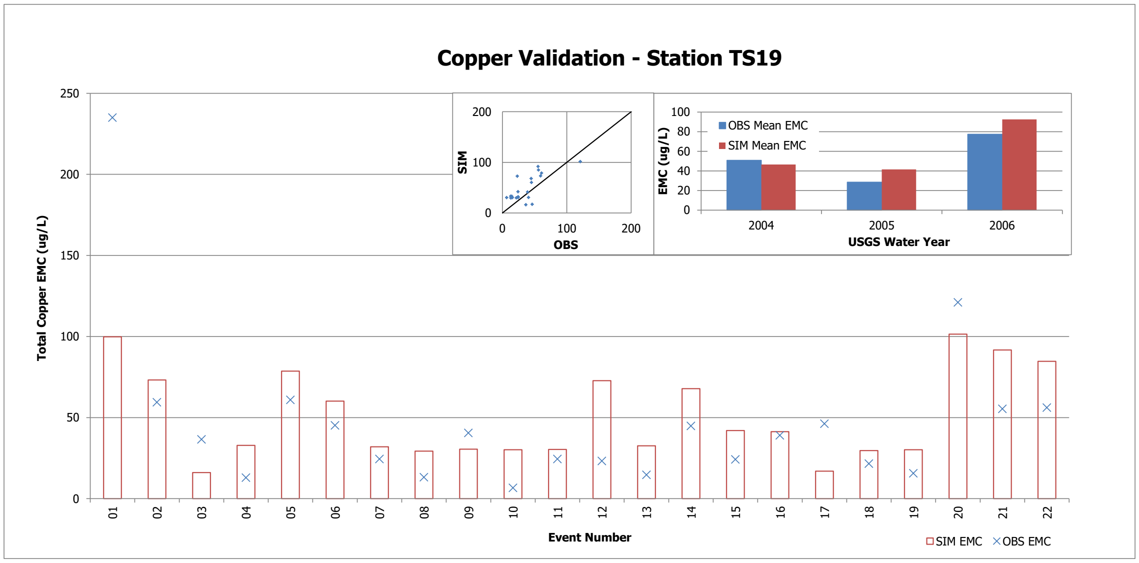

TSS Validation - Station TS20
TSS EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

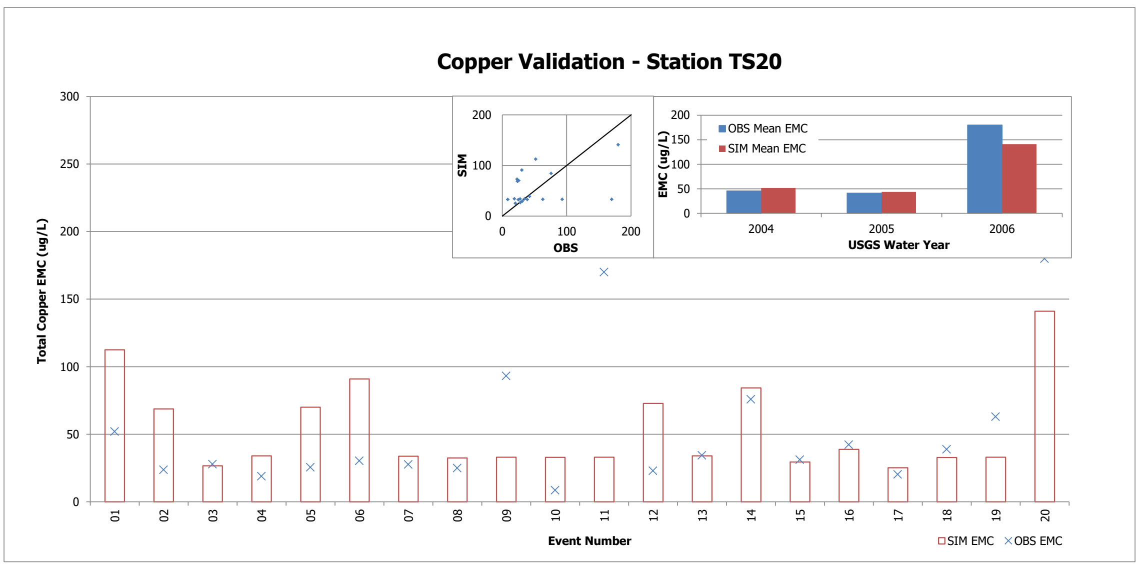

TSS Validation - Station TS21
TSS EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

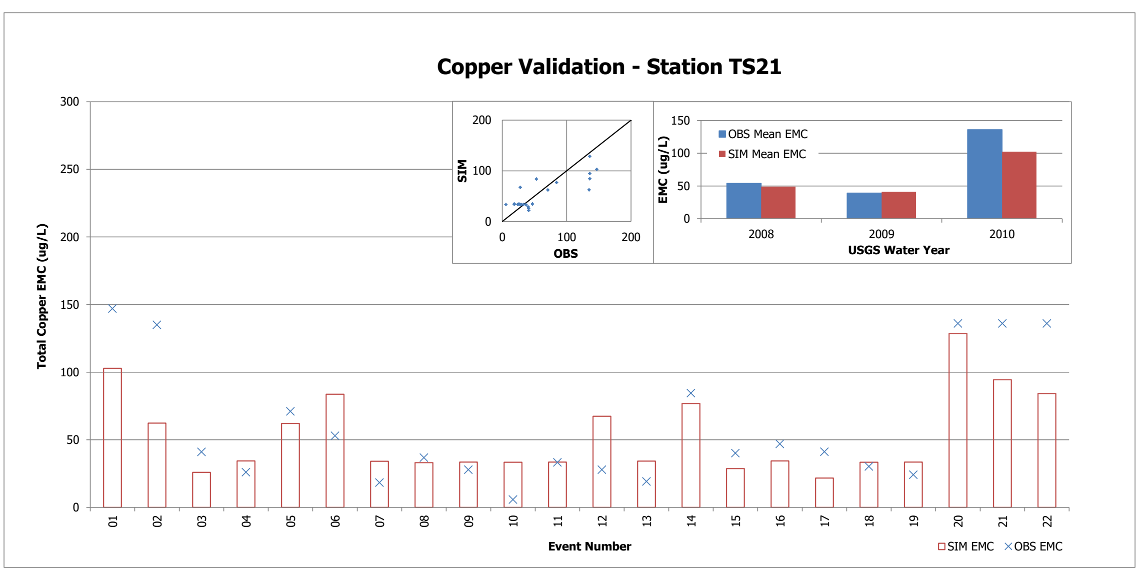

TSS Validation - Station TS22
TSS EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

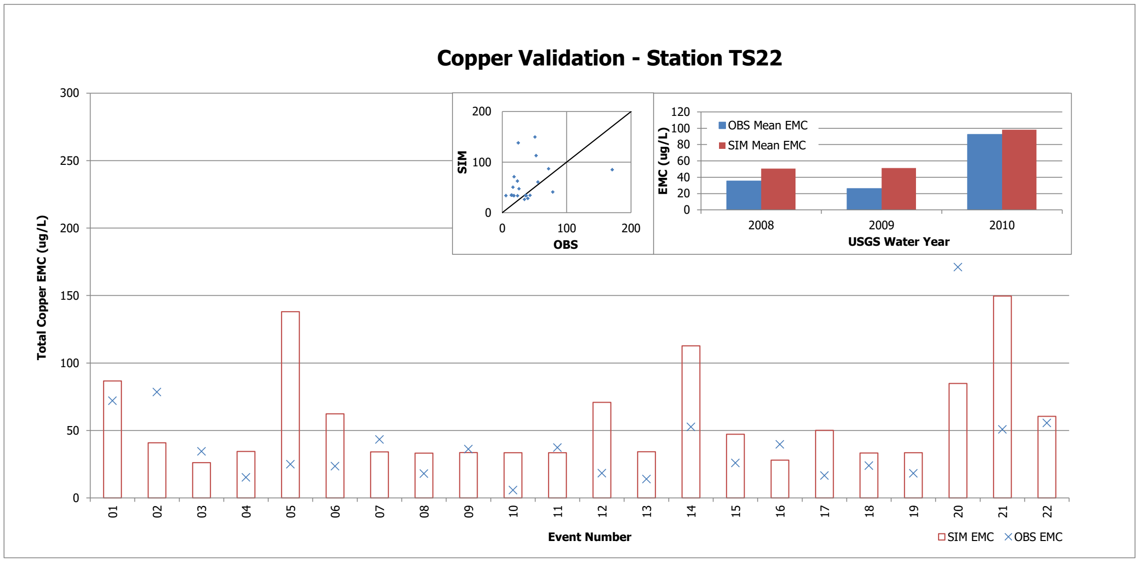

TSS Validation - Station TS23
TSS EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

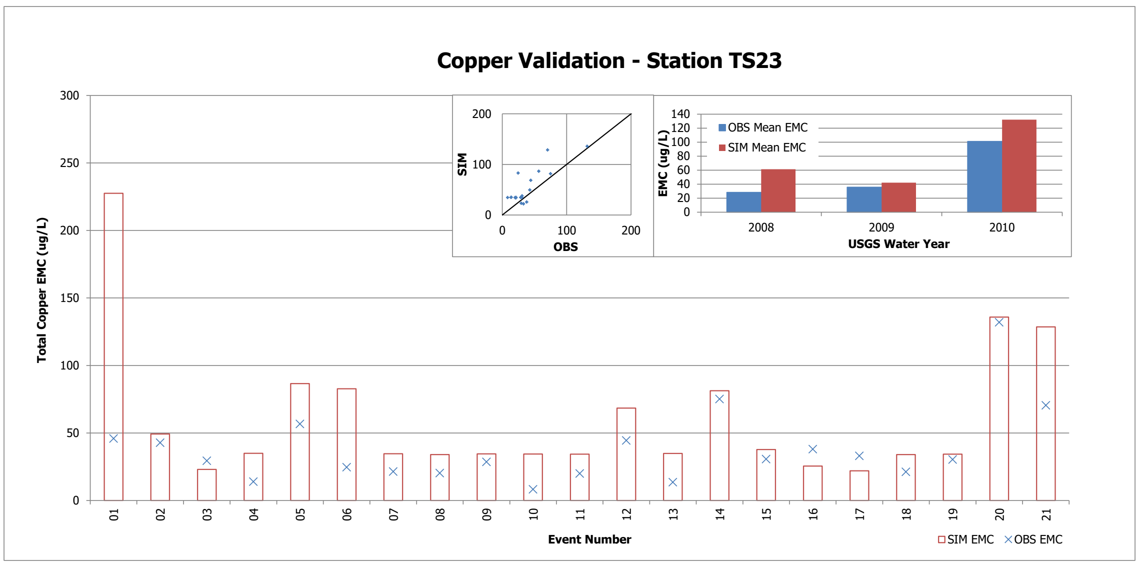

TSS Validation - Station TS24
TSS EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

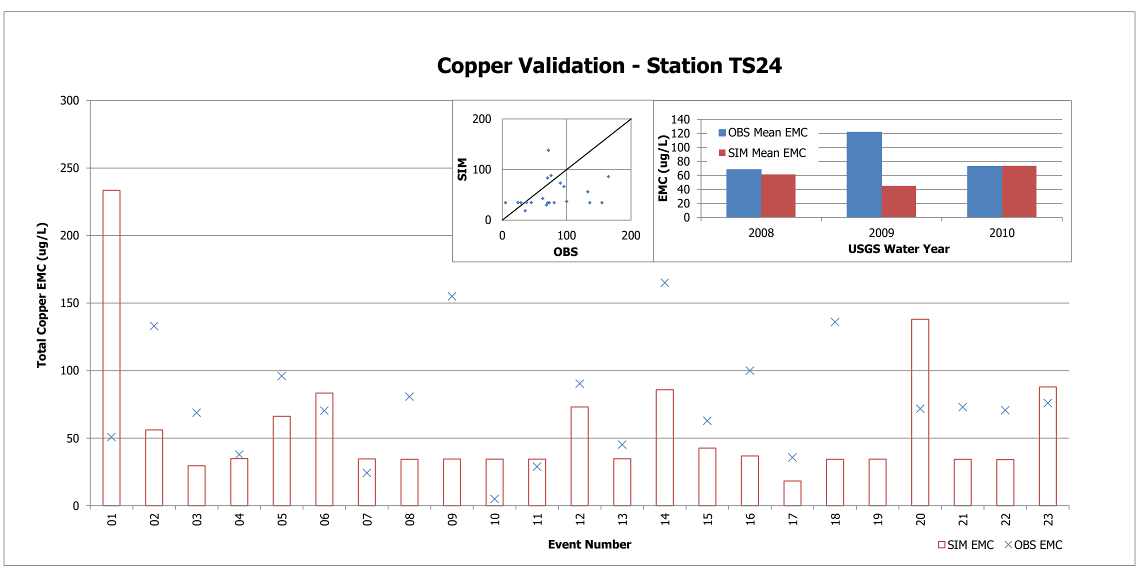

Copper Validation - Station TS19
Total Copper EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2004
2005
2006
USGS Water Year

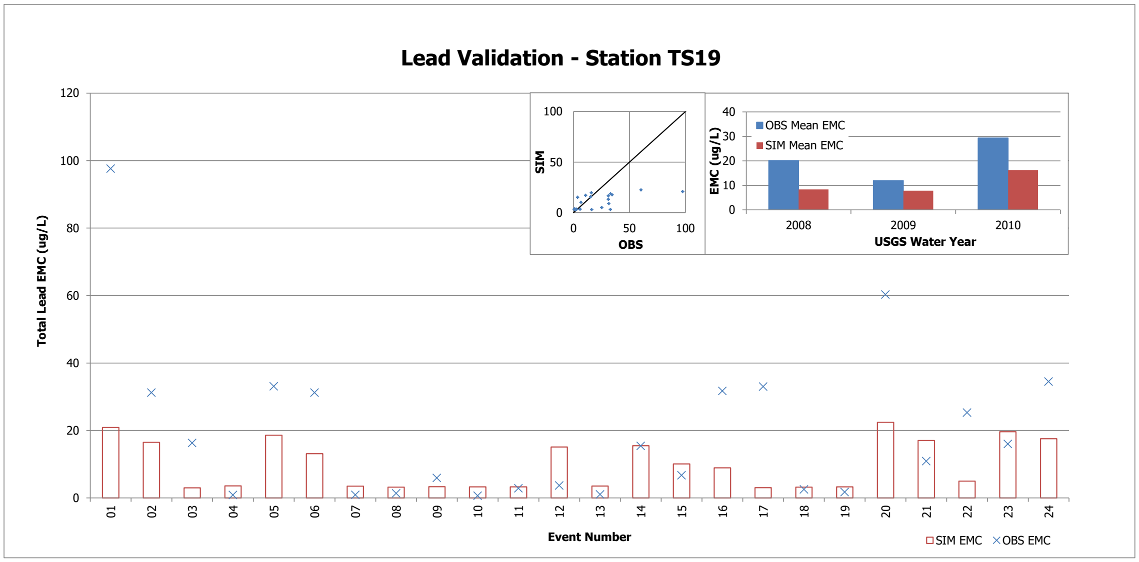

Copper Validation - Station TS20
Total Copper EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2004
2005
2006
USGS Water Year

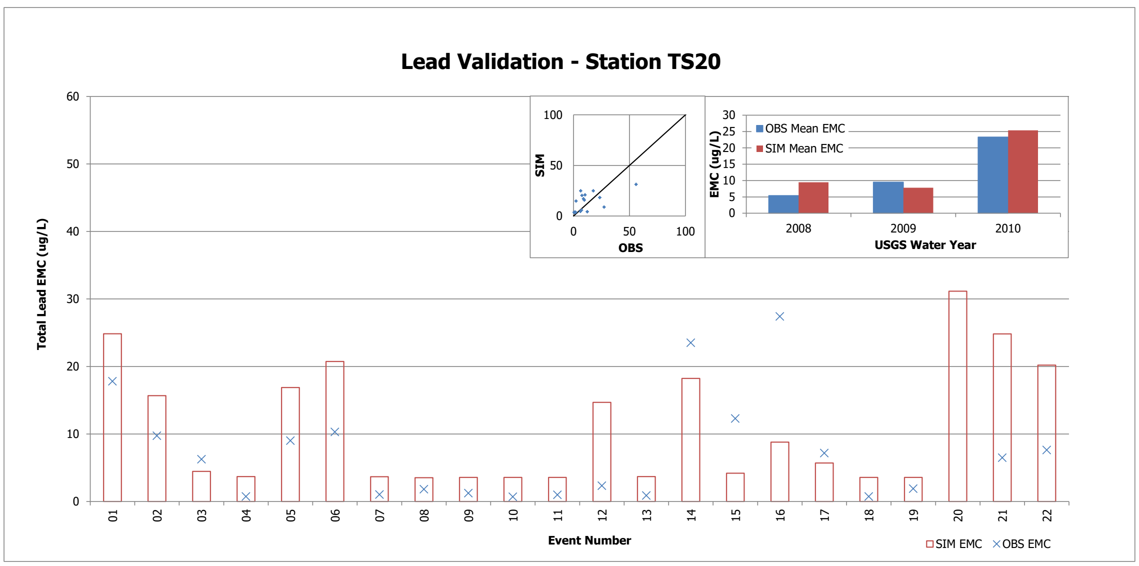

Copper Validation - Station TS21
Total Copper EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

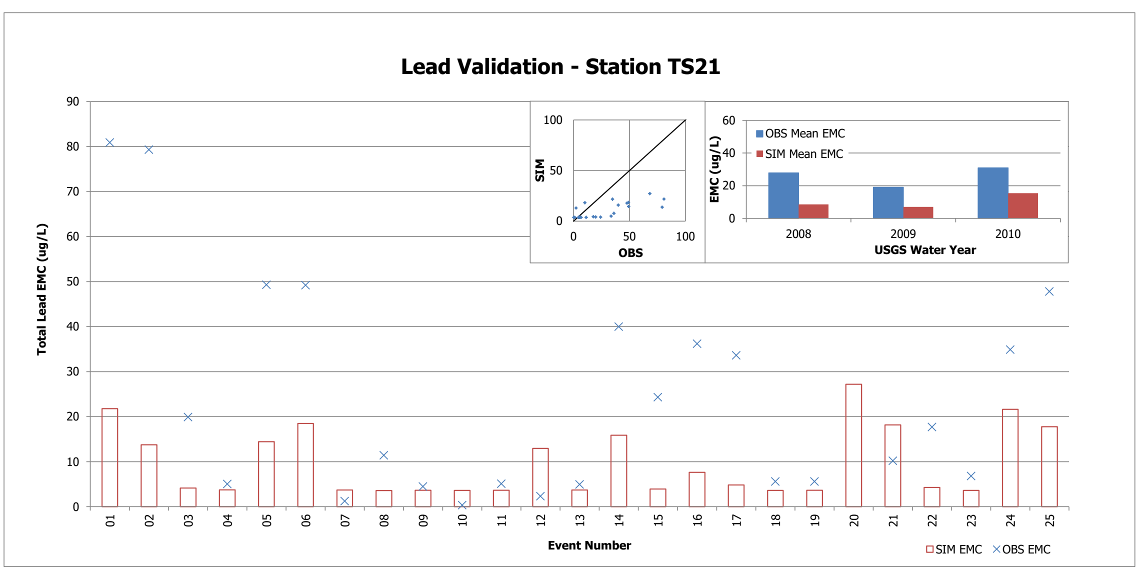

Copper Validation - Station TS22
Total Copper EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

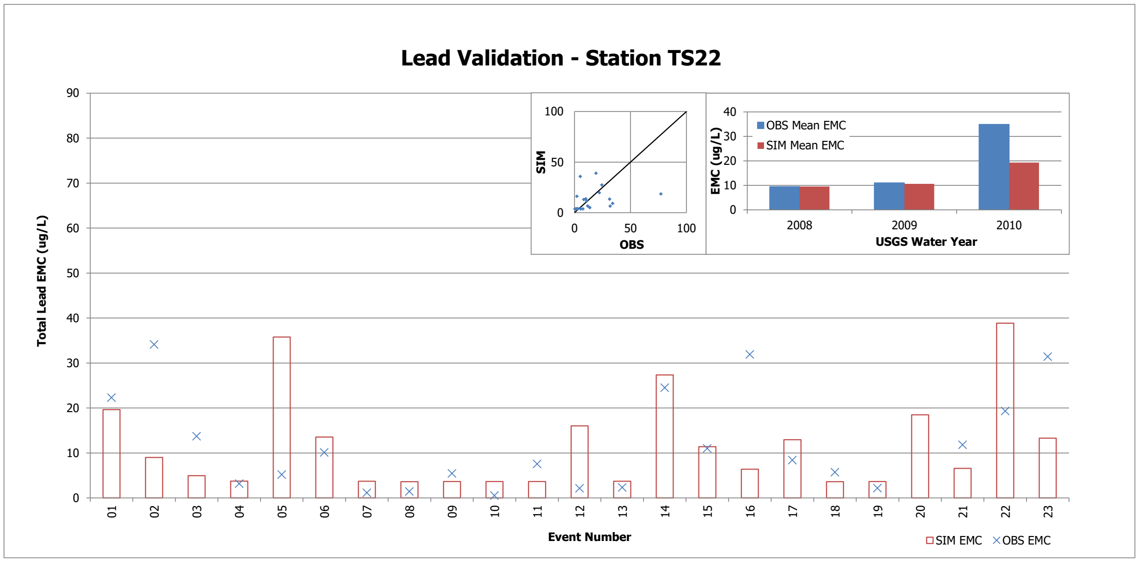

Copper Validation - Station TS23
Total Copper EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

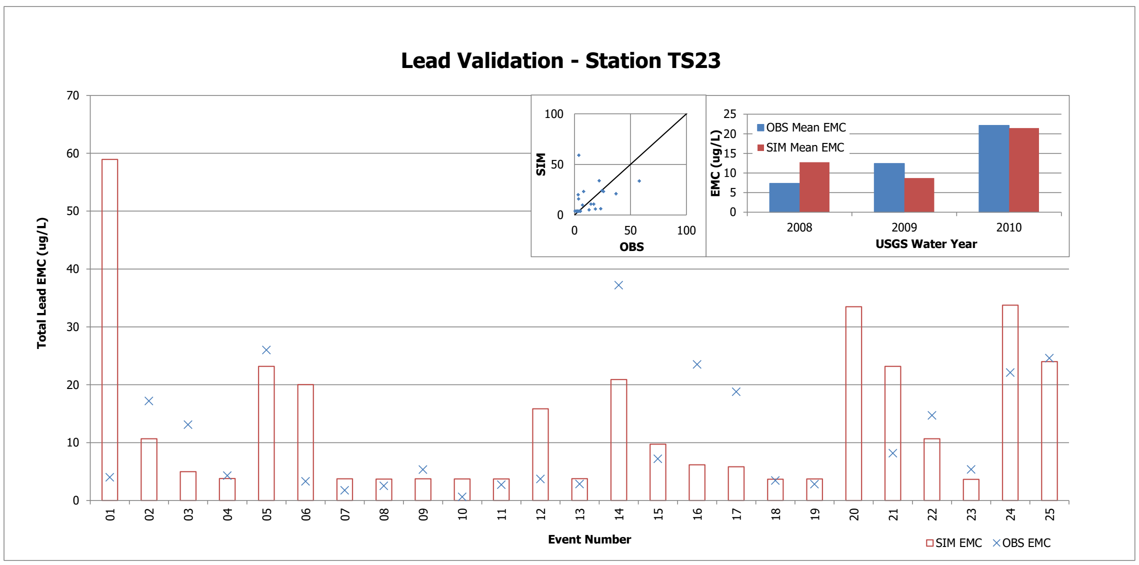

Copper Validation - Station TS24
Total Copper EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

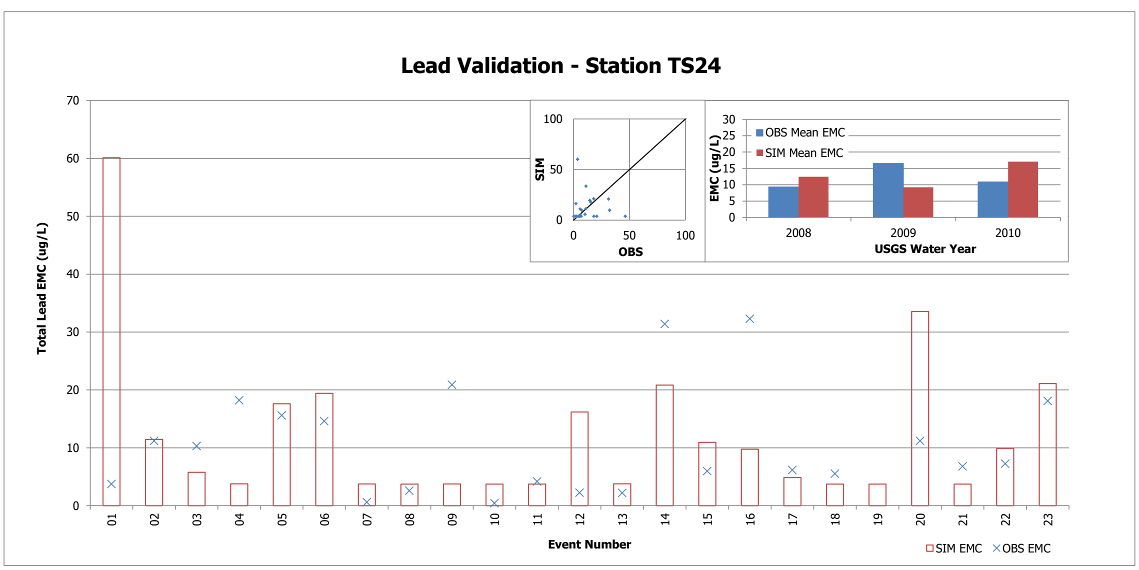

Lead Validation - Station TS19
Total Lead EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year

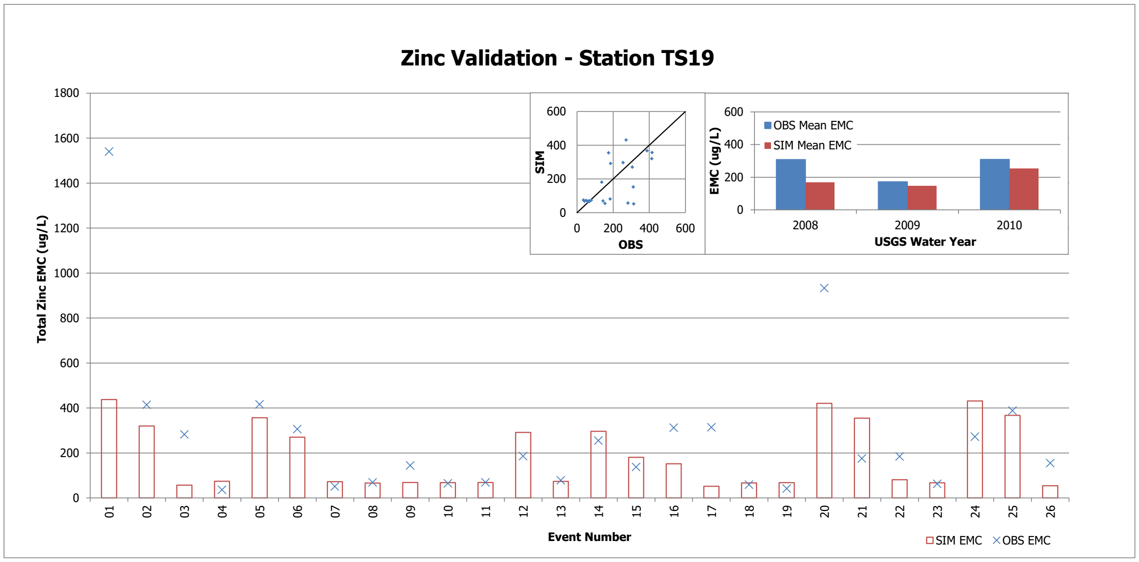

Lead Validation - Station TS20
Total Lead EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year

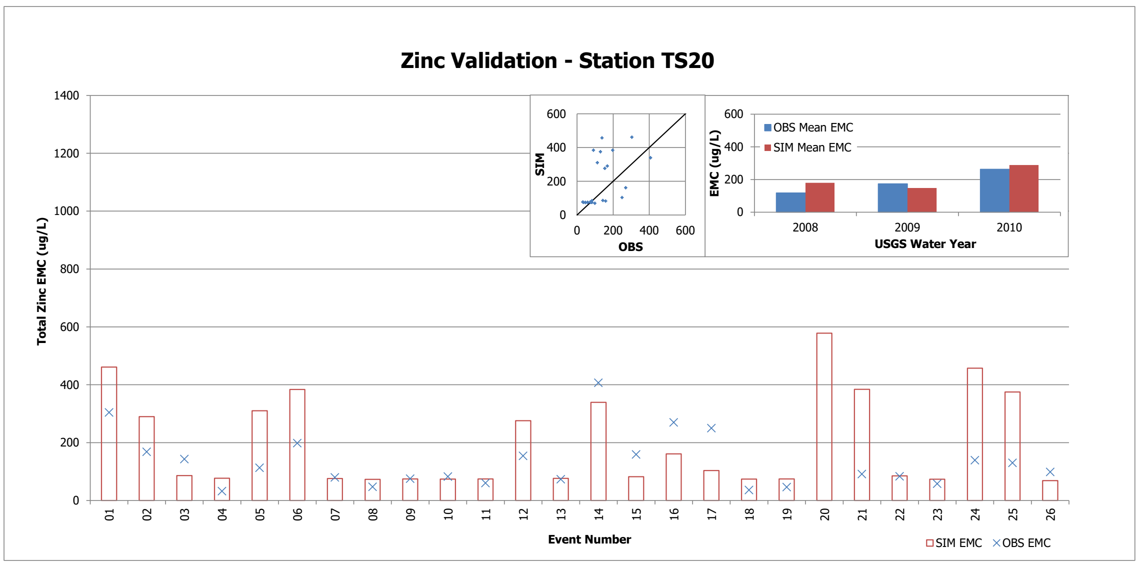

Lead Validation - Station TS21
Total Lead EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year

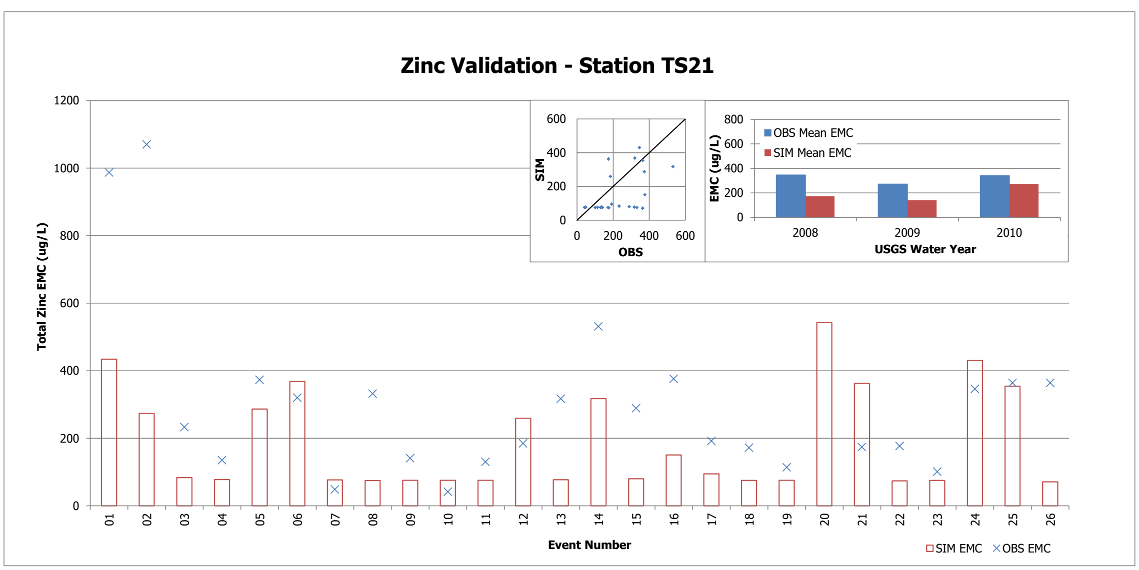

Lead Validation - Station TS22
Total Lead EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010

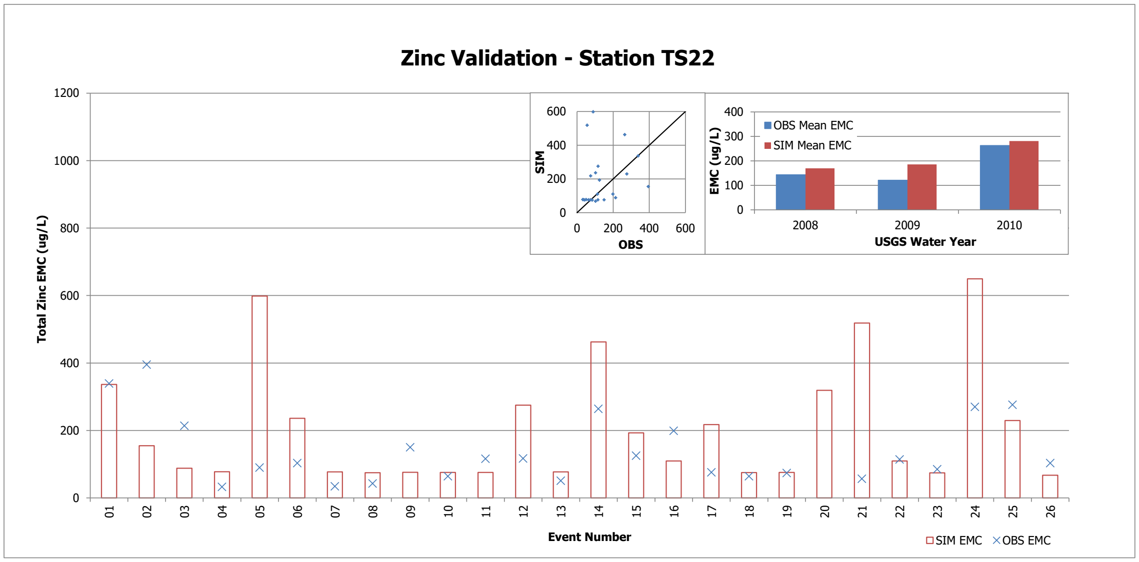

Lead Validation - Station TS23
Total Lead EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010


Lead Validation - Station TS24
Total Lead EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010

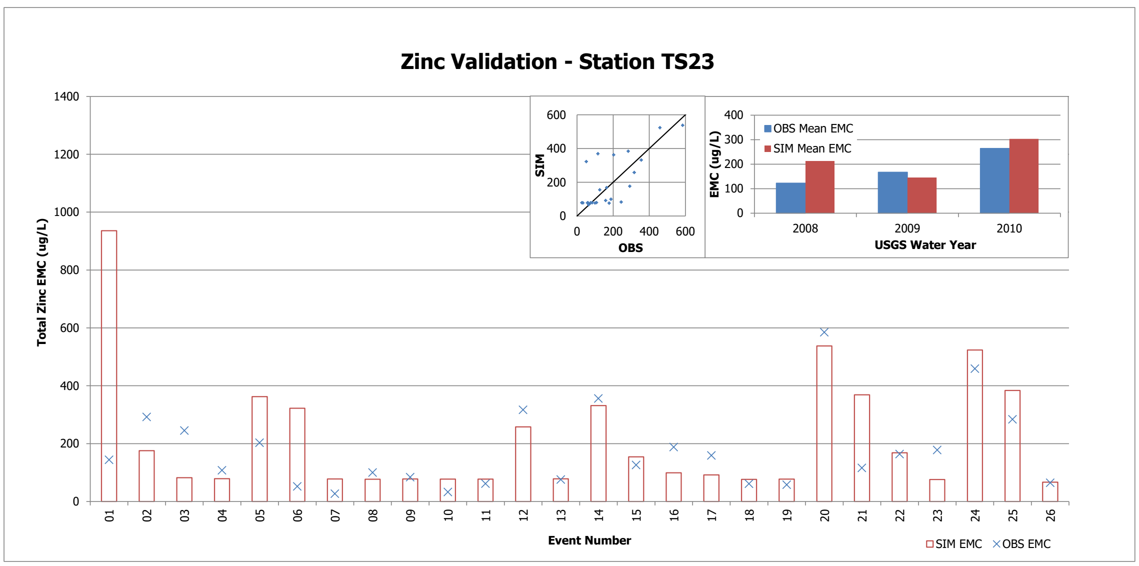

Zinc Validation - Station TS19
Total Zinc EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year


Zinc Validation - Station TS20
Total Zinc EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

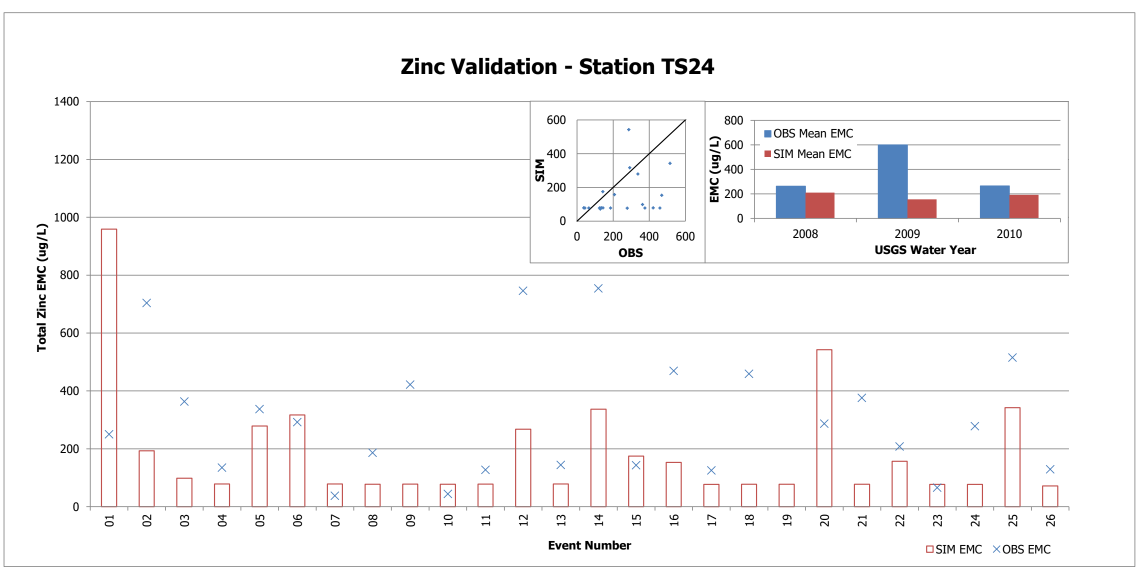

Zinc Validation - Station TS21
Total Zinc EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year



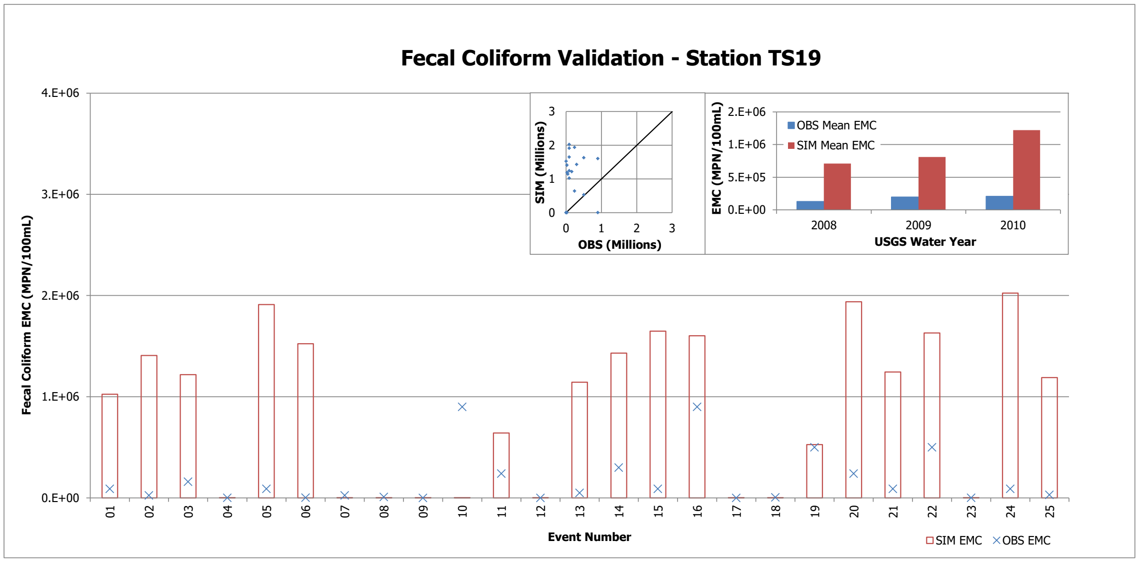
Zinc Validation - Station TS22
Total Zinc EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010



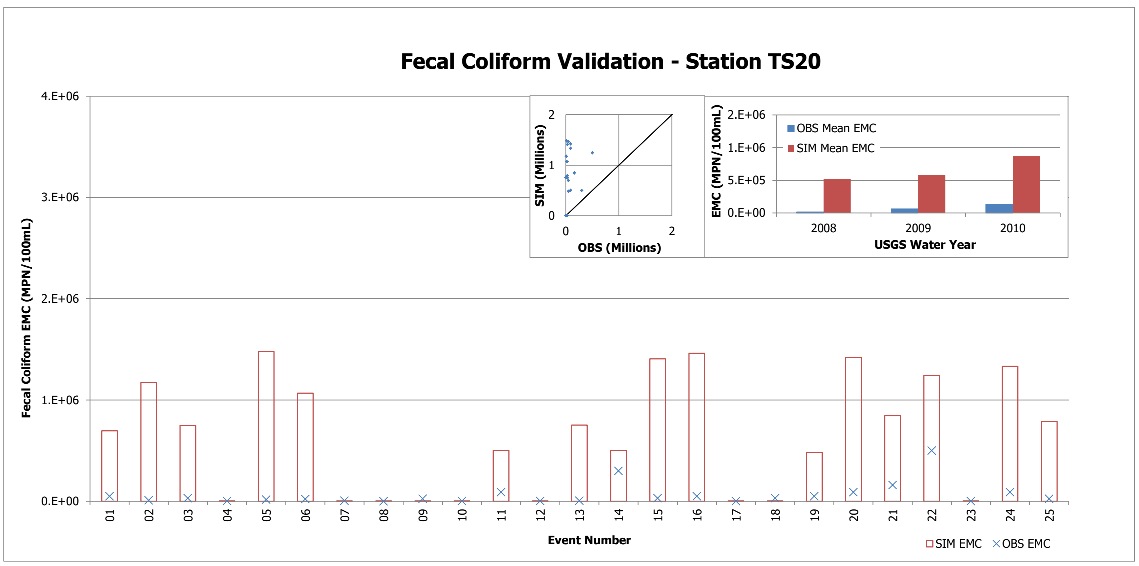
Zinc Validation - Station TS23
Total Zinc EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010



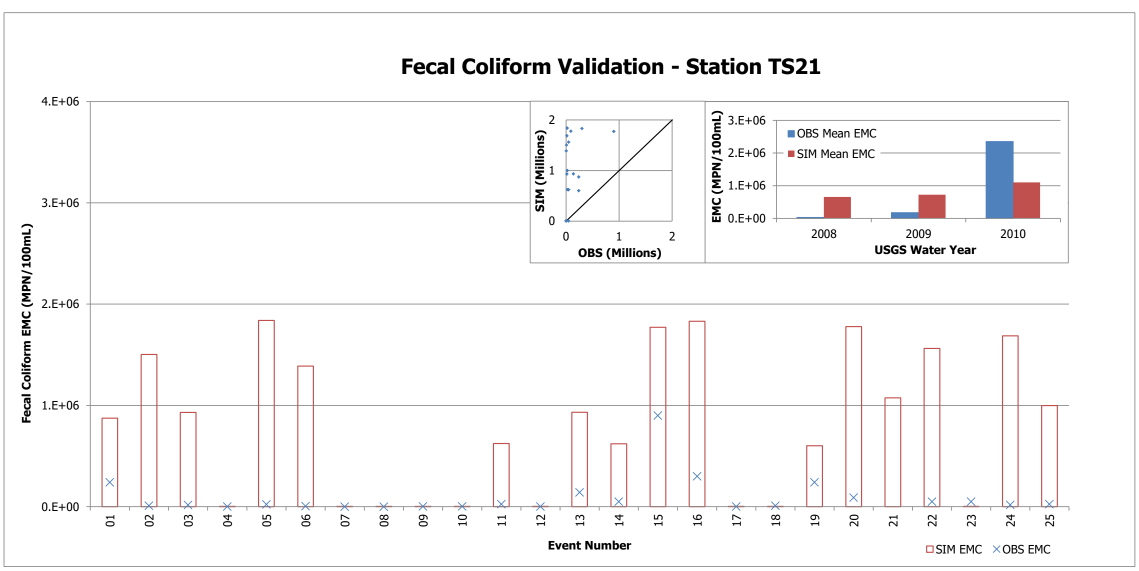
Zinc Validation - Station TS24
Total Zinc EMC (ug/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (ug/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010



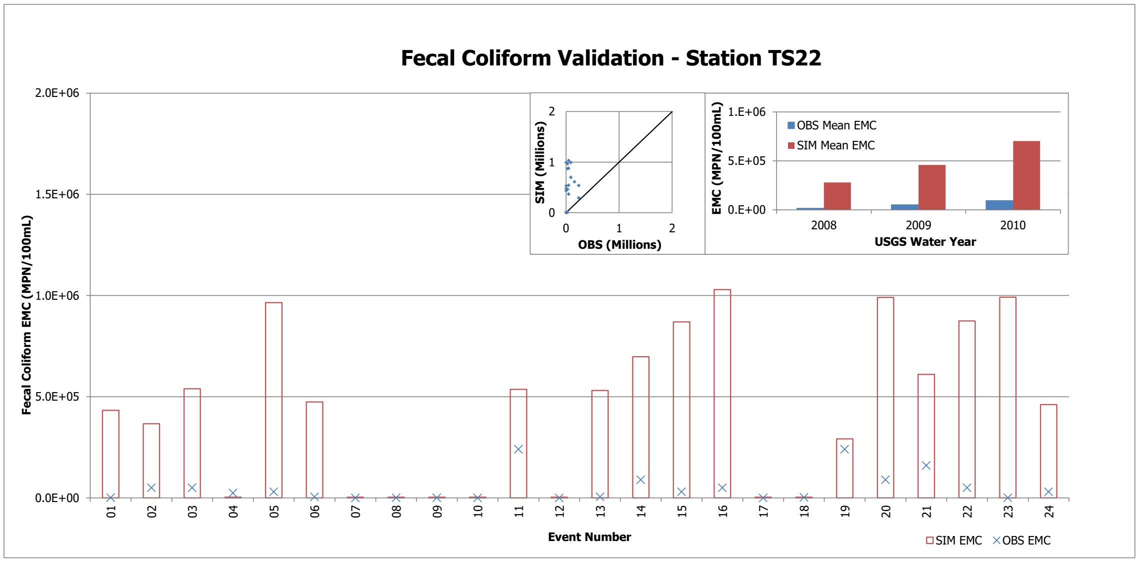
Fecal Coliform Validation - Station TS19
Fecal Coliform EMC (MPN/100mL)
Event Number
SIM EMC
OBS EMC
SIM (Millions)
OBS (Millions)
EMC (MPN/100mL)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010



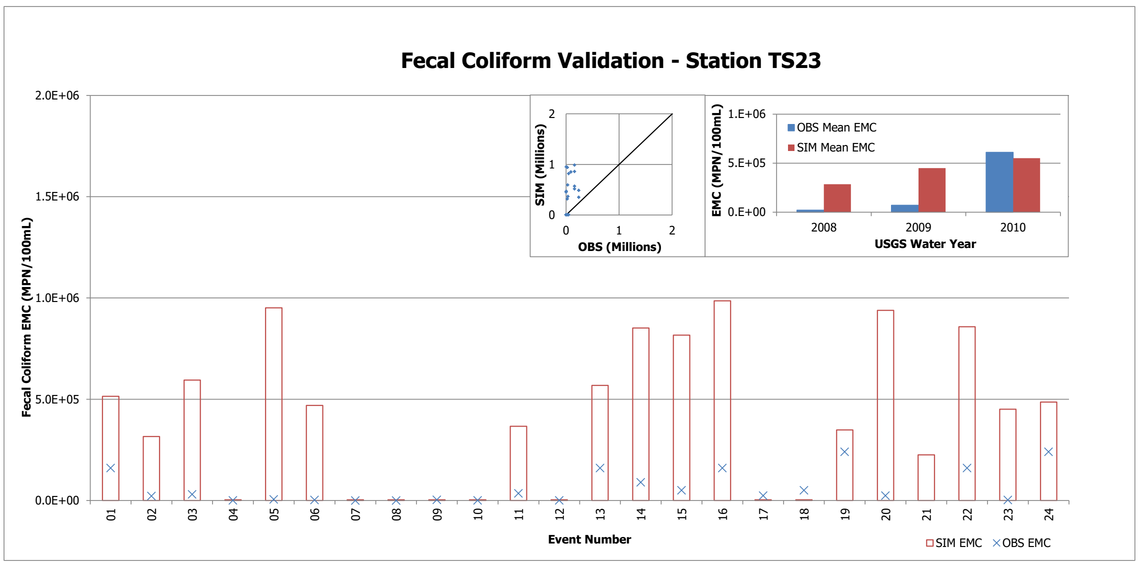
Fecal Coliform Validation - Station TS20
Fecal Coliform EMC (MPN/100mL)
Event Number
SIM EMC
OBS EMC
SIM (Millions)
OBS (Millions)
EMC (MPN/100mL)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010



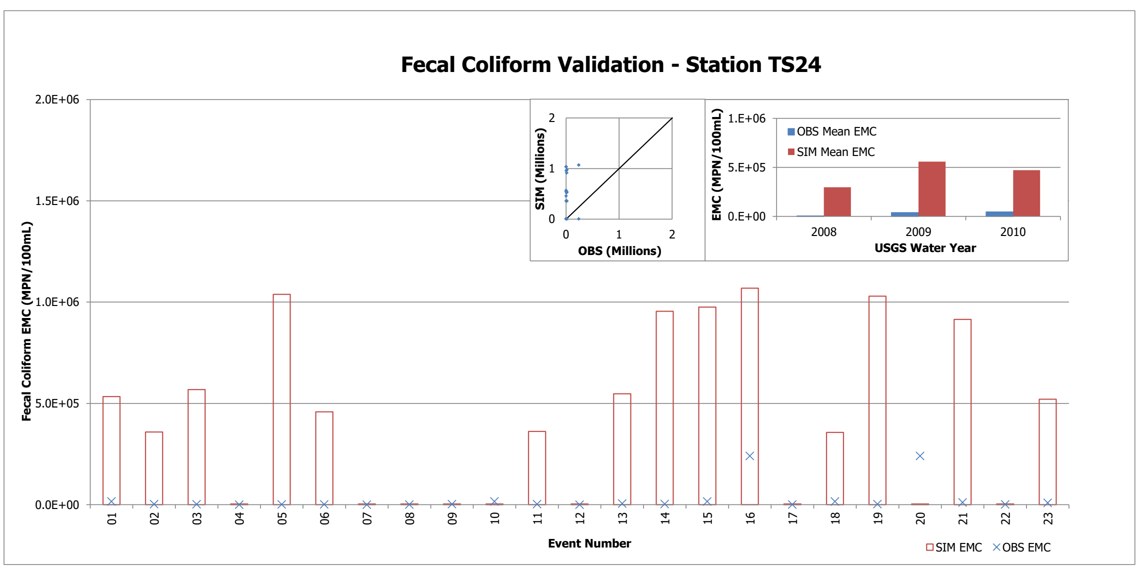
Fecal Coliform Validation - Station TS21
Fecal Coliform EMC (MPN/100mL)
Event Number
SIM EMC
OBS EMC
SIM (Millions)
OBS (Millions)
EMC (MPN/100mL)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010



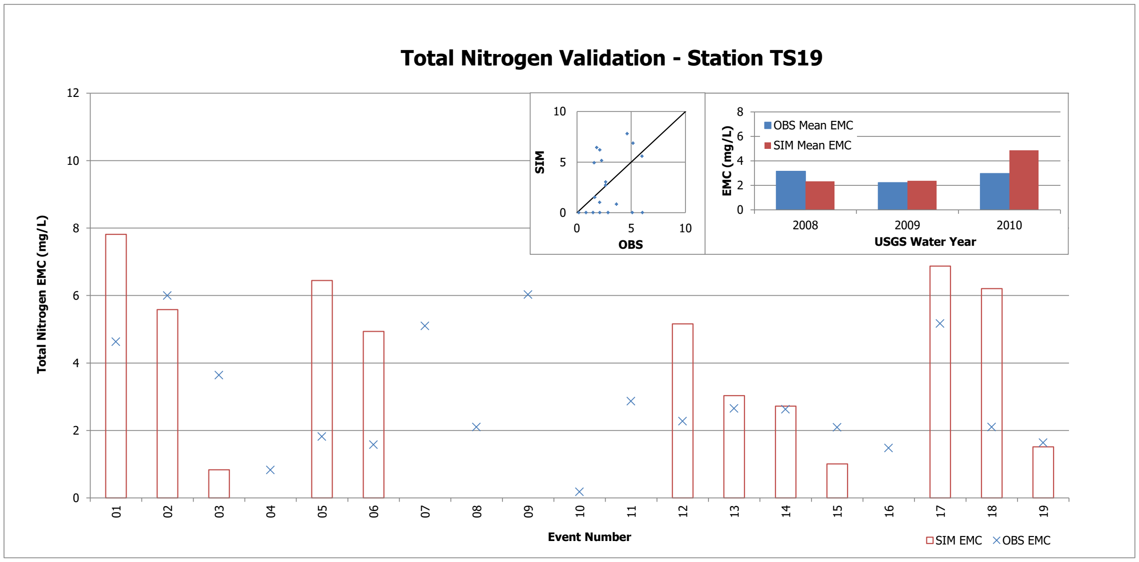
Fecal Coliform Validation - Station TS22
Fecal Coliform EMC (MPN/100mL)
2.0E+06
1.5E+06
1.0E+06
5.0E+05
0.0E+00
SIM (Millions)
OBS (Millions)
EMC (MPN/100mL)
1.E+06
5.E+05
0.E+00
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Event Number
SIM EMC
OBS EMC

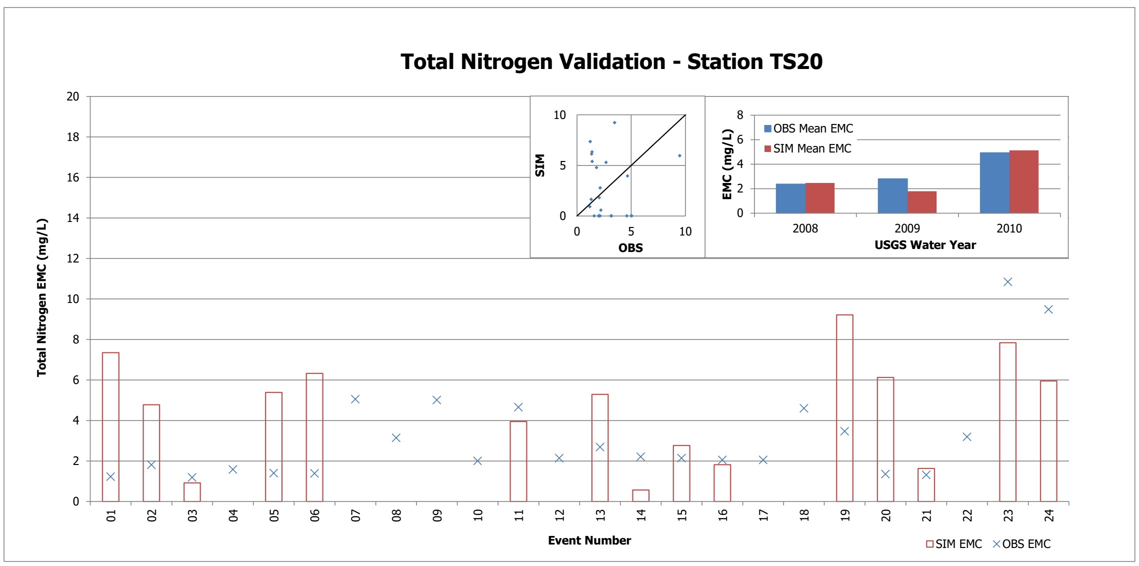


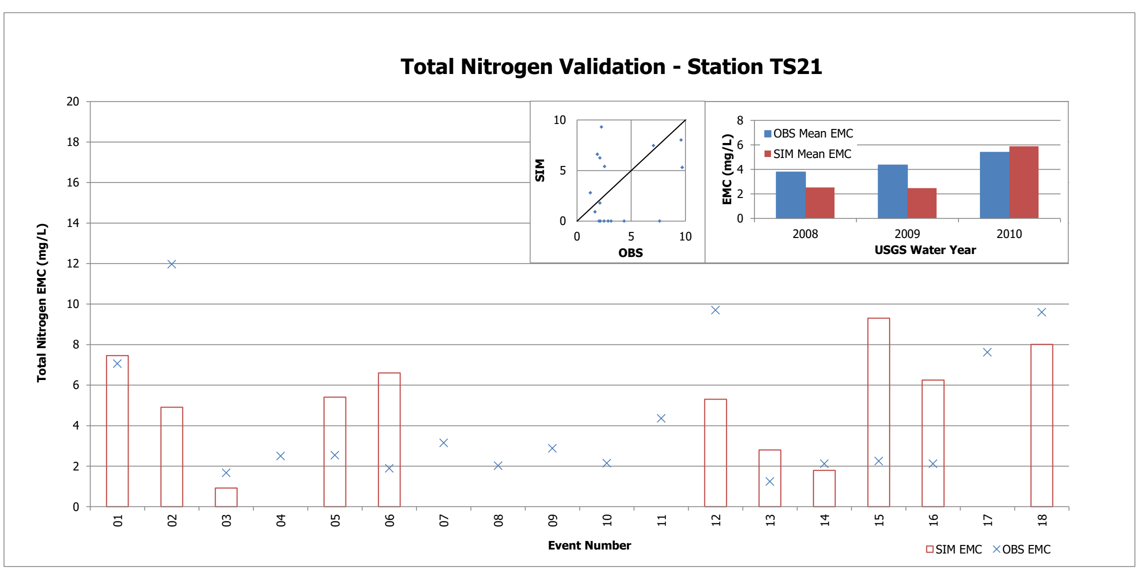
Fecal Coliform Validation - Station TS23
Fecal Coliform EMC (MPN/100mL)
2.0E+06
1.5E+06
1.0E+06
5.0E+05
0.0E+00
SIM (Millions)
OBS (Millions)
EMC (MPN/100mL)
1.E+06
5.E+05
0.E+00
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Event Number
SIM EMC
OBS EMC

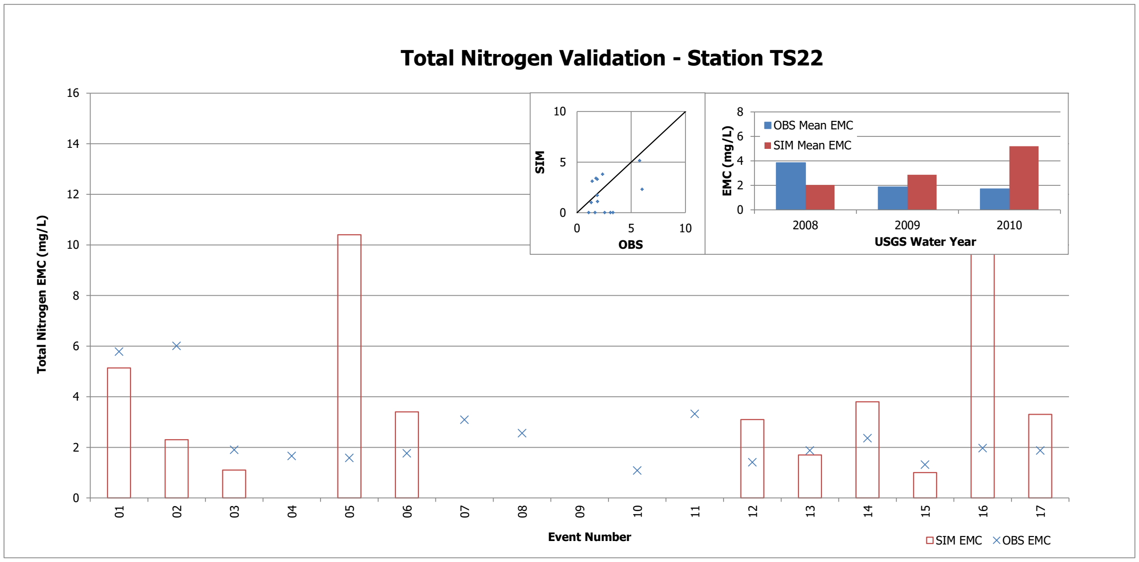


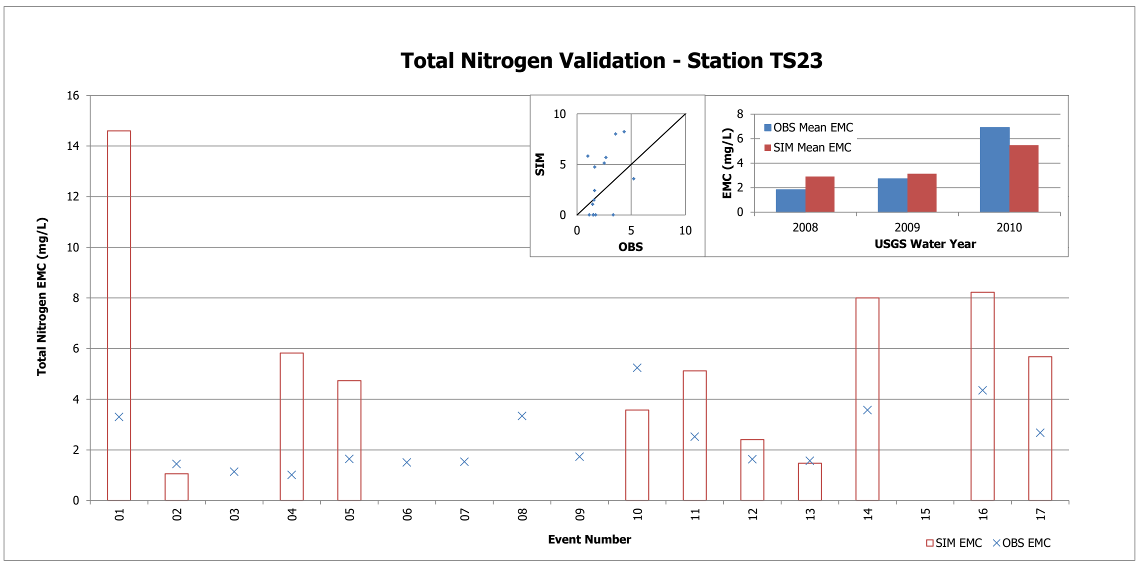
Fecal Coliform Validation - Station TS24
Fecal Coliform EMC (MPN/100mL)
2.0E+06
1.5E+06
1.0E+06
5.0E+05
0.0E+00
SIM (Millions)
OBS (Millions)
EMC (MPN/100mL)
1.E+06
5.E+05
0.E+00
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Event Number
SIM EMC
OBS EMC

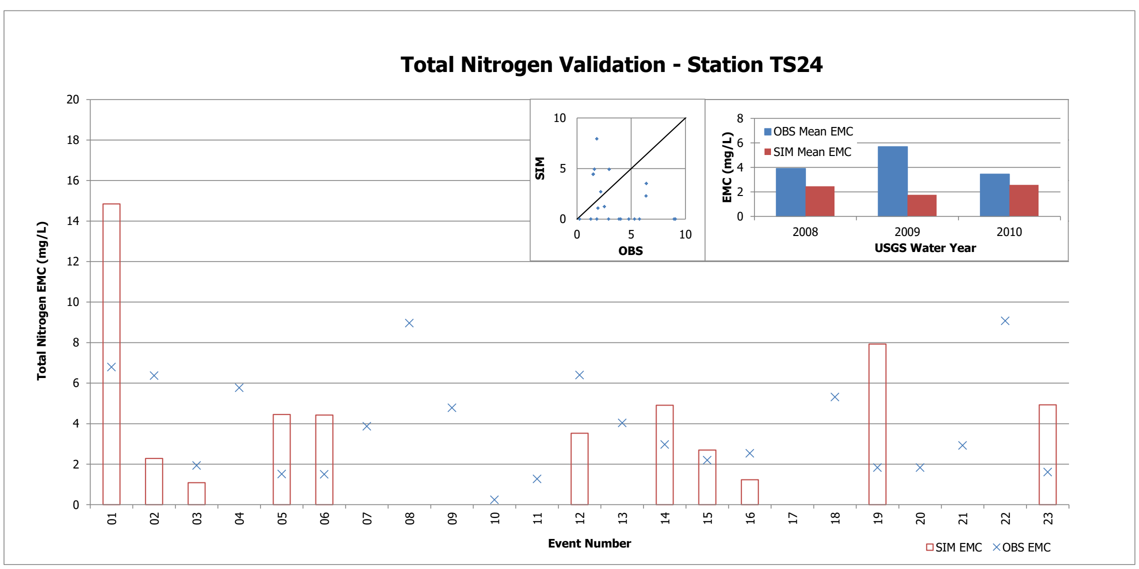

Total Nitrogen Validation - Station TS19
Total Nitrogen EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

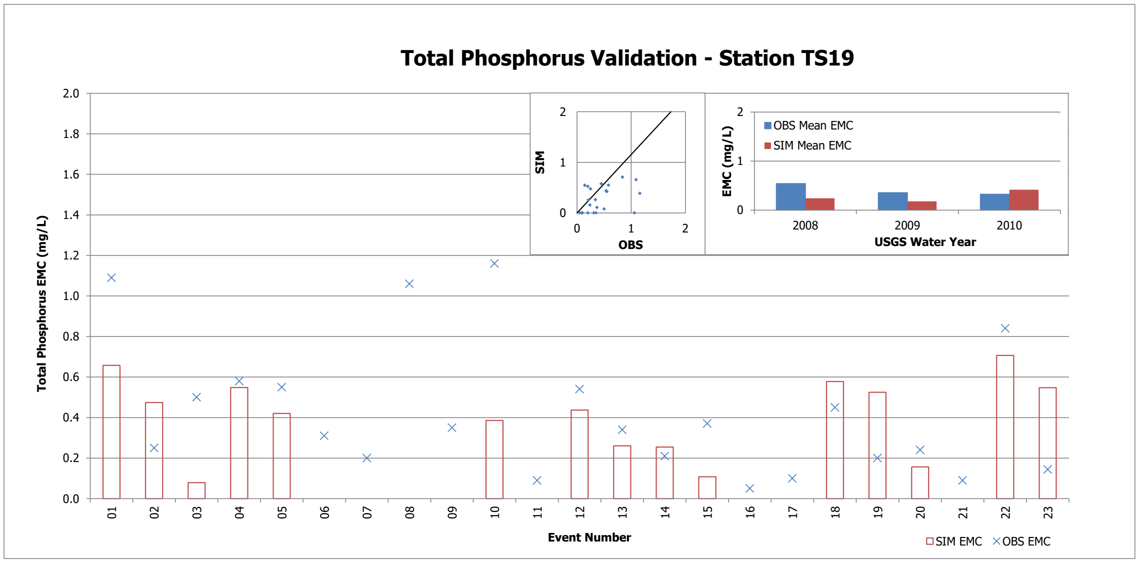

Total Nitrogen Validation - Station TS20
Total Nitrogen EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year

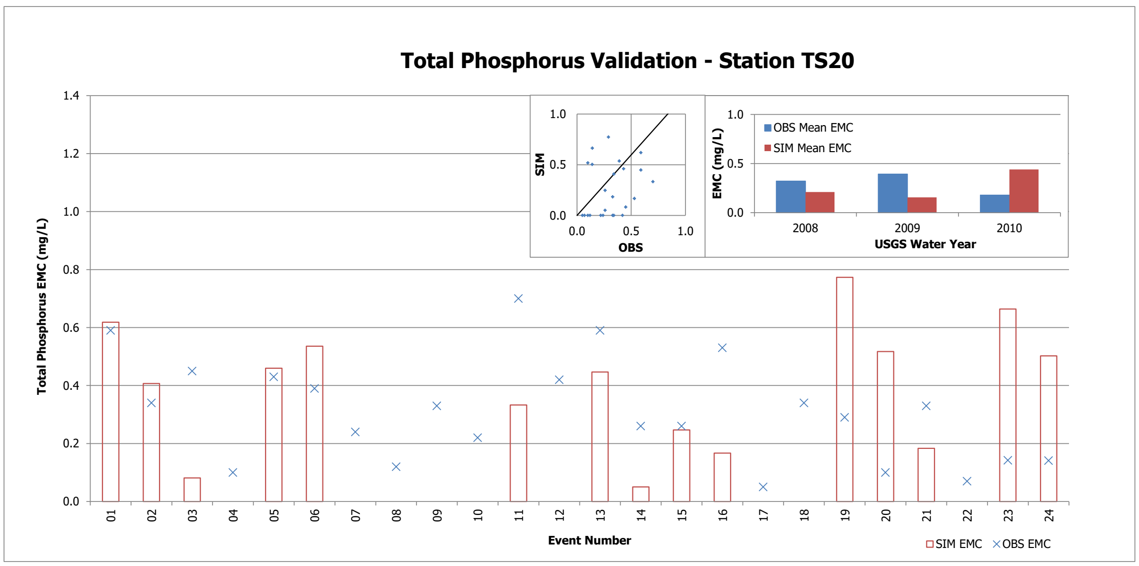

Total Nitrogen Validation - Station TS21
Total Nitrogen EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year


Total Nitrogen Validation - Station TS22
Total Nitrogen EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010


Total Nitrogen Validation - Station TS23
Total Nitrogen EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010


Total Nitrogen Validation - Station TS24
Total Nitrogen EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
USGS Water Year
2008
2009
2010


Total Phosphorus Validation - Station TS19
Total Phosphorus EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year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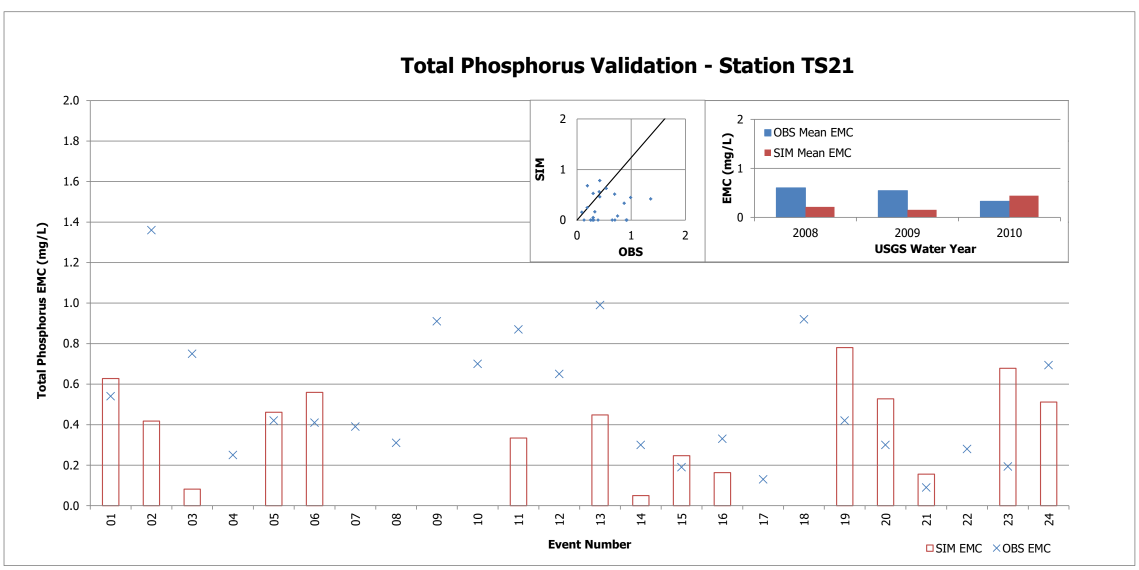
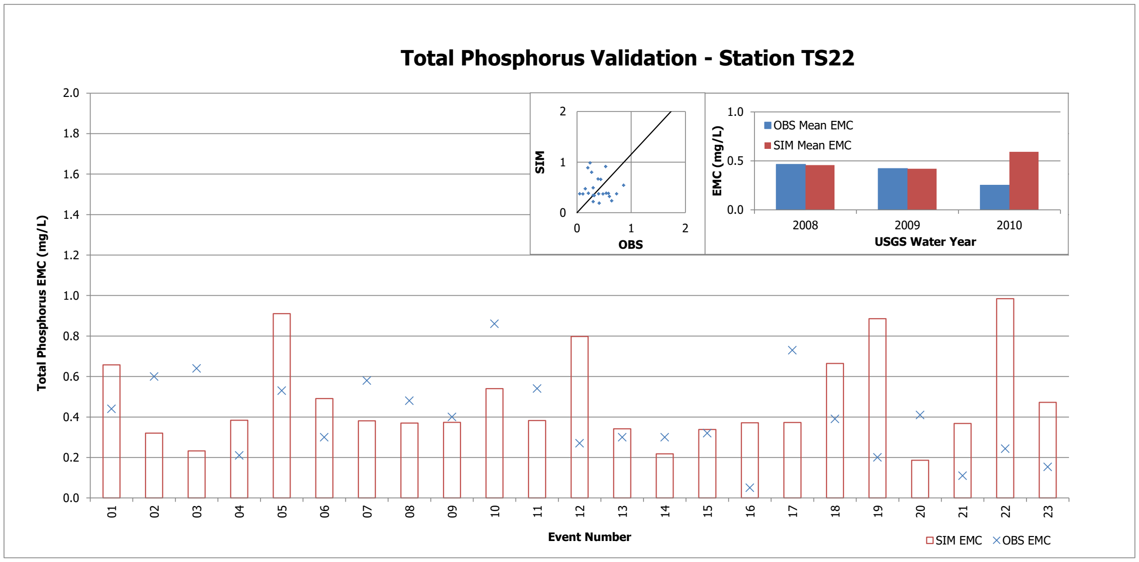
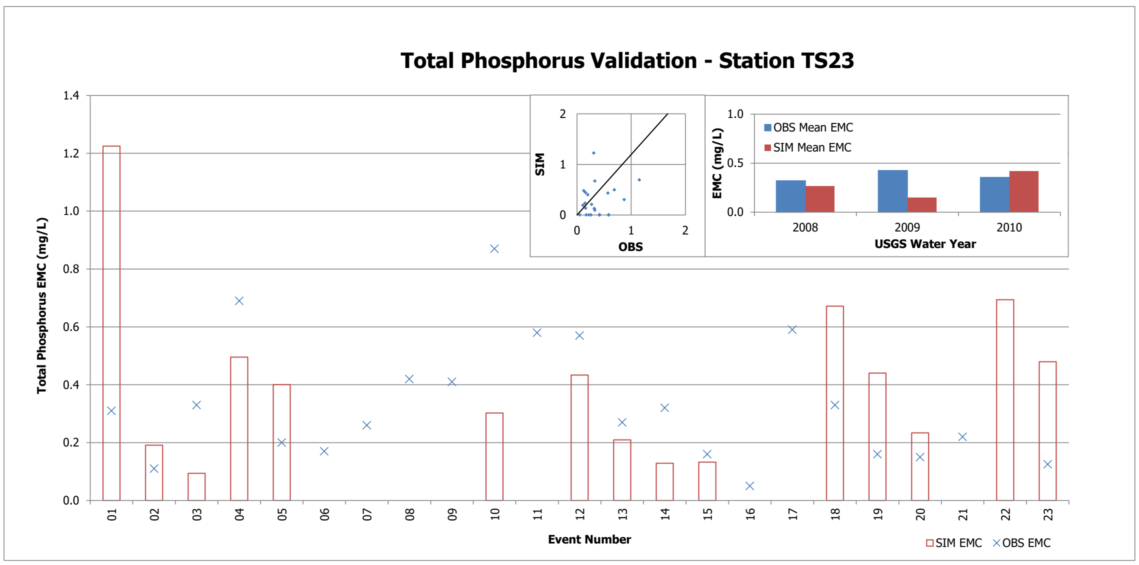
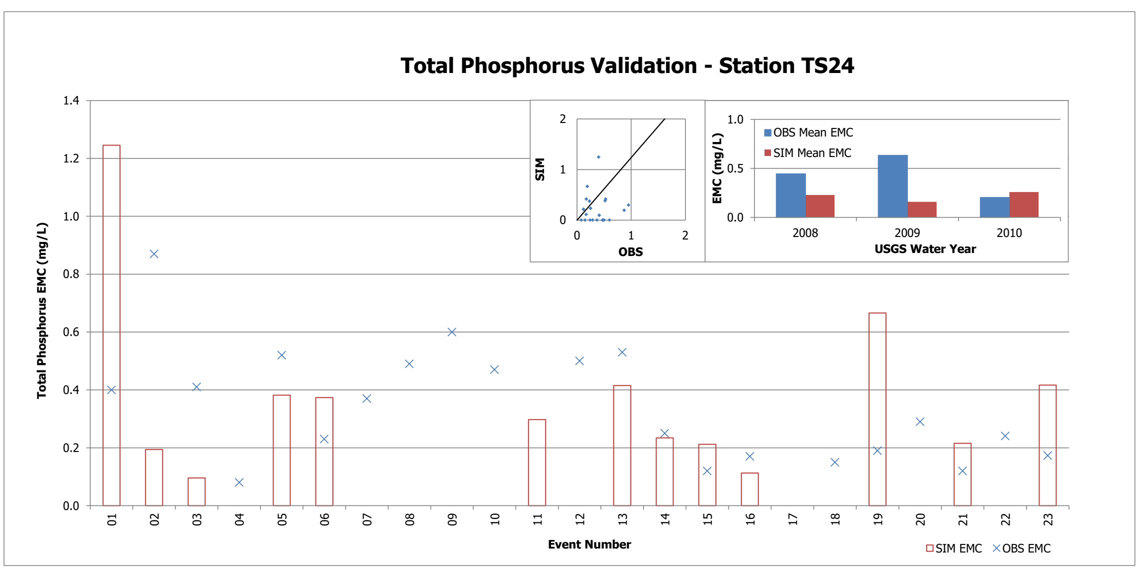
Total Phosphorus EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year


Total Phosphorus Validation - Station TS21
Total Phosphorus EMC (mg/L)
Event Number
SIM EMC
OBS EMC
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year


Total Phosphorus Validation - Station TS22
Total Phosphorus EMC (mg/L)
Event Number
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year
SIM EMC
OBS EMC


Total Phosphorus Validation - Station TS23
Total Phosphorus EMC (mg/L)
Event Number
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year
SIM EMC
OBS EMC


Total Phosphorus Validation - Station TS24
Total Phosphorus EMC (mg/L)
Event Number
SIM
OBS
EMC (mg/L)
OBS Mean EMC
SIM Mean EMC
2008
2009
2010
USGS Water Year
SIM EMC
OBS EMC

Attachment G

RAA Approach Figures

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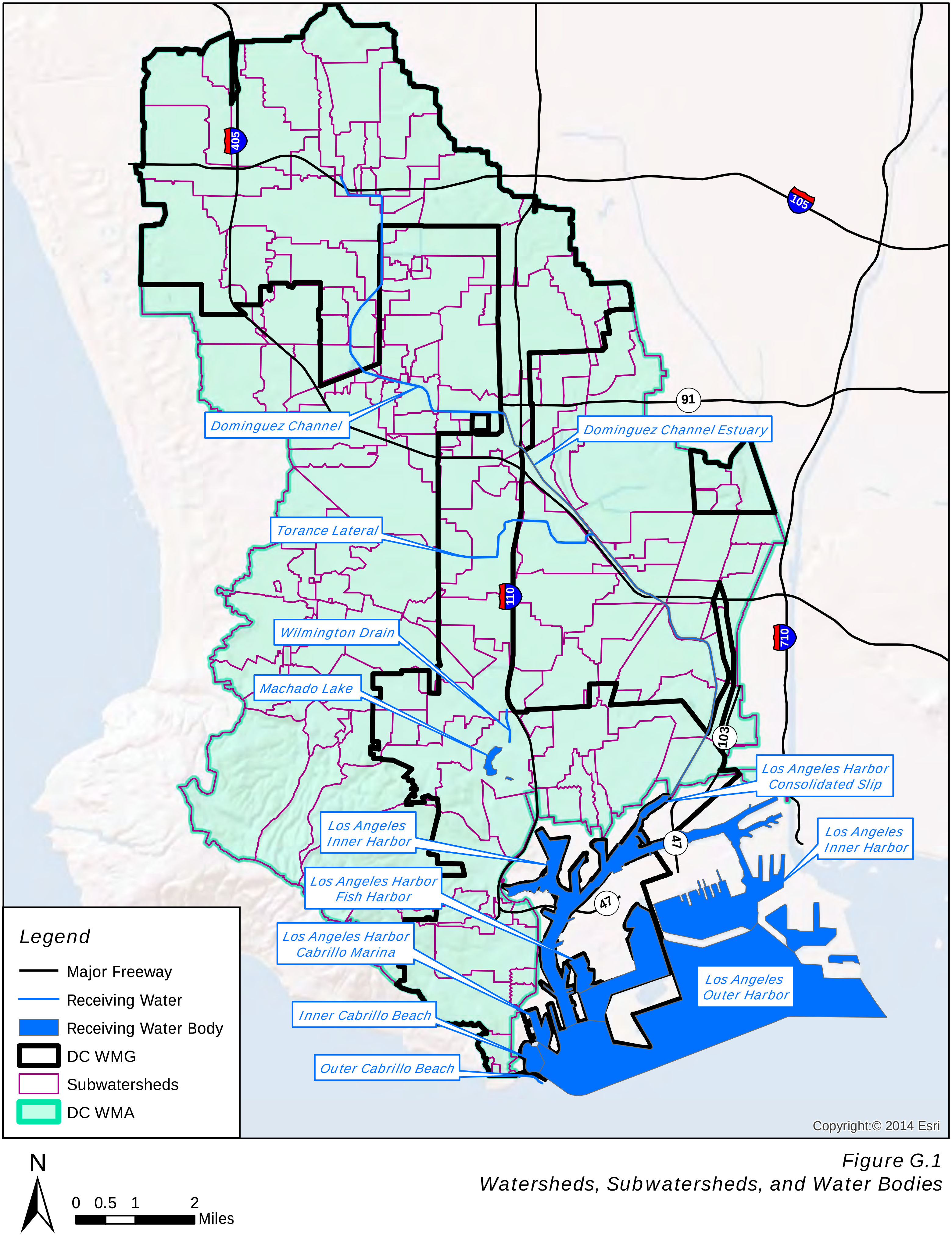

Figure G.1
Watersheds, Subwatersheds, and Water Bodies

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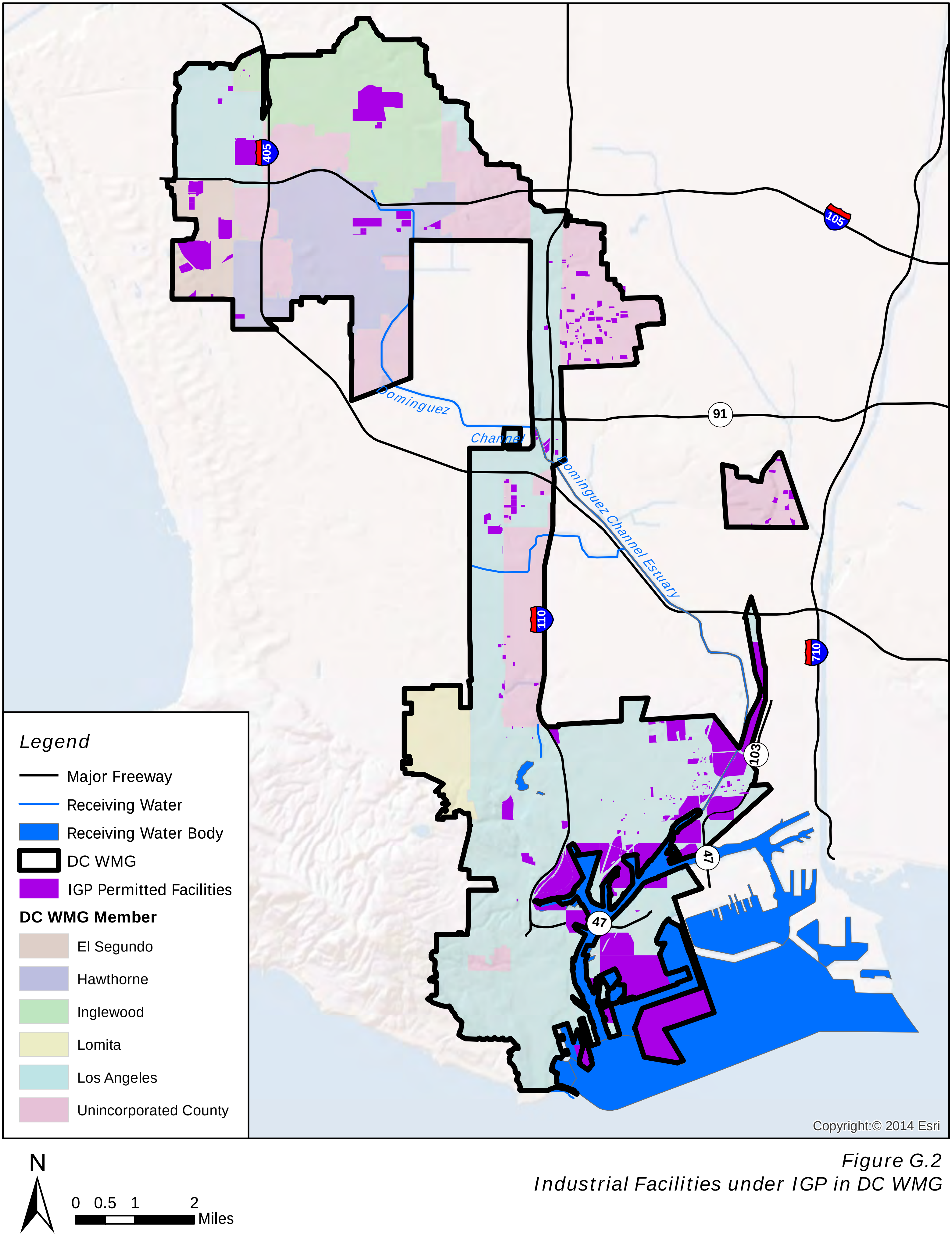

Figure G.2
Industrial Facilities under IGP in DC WMG

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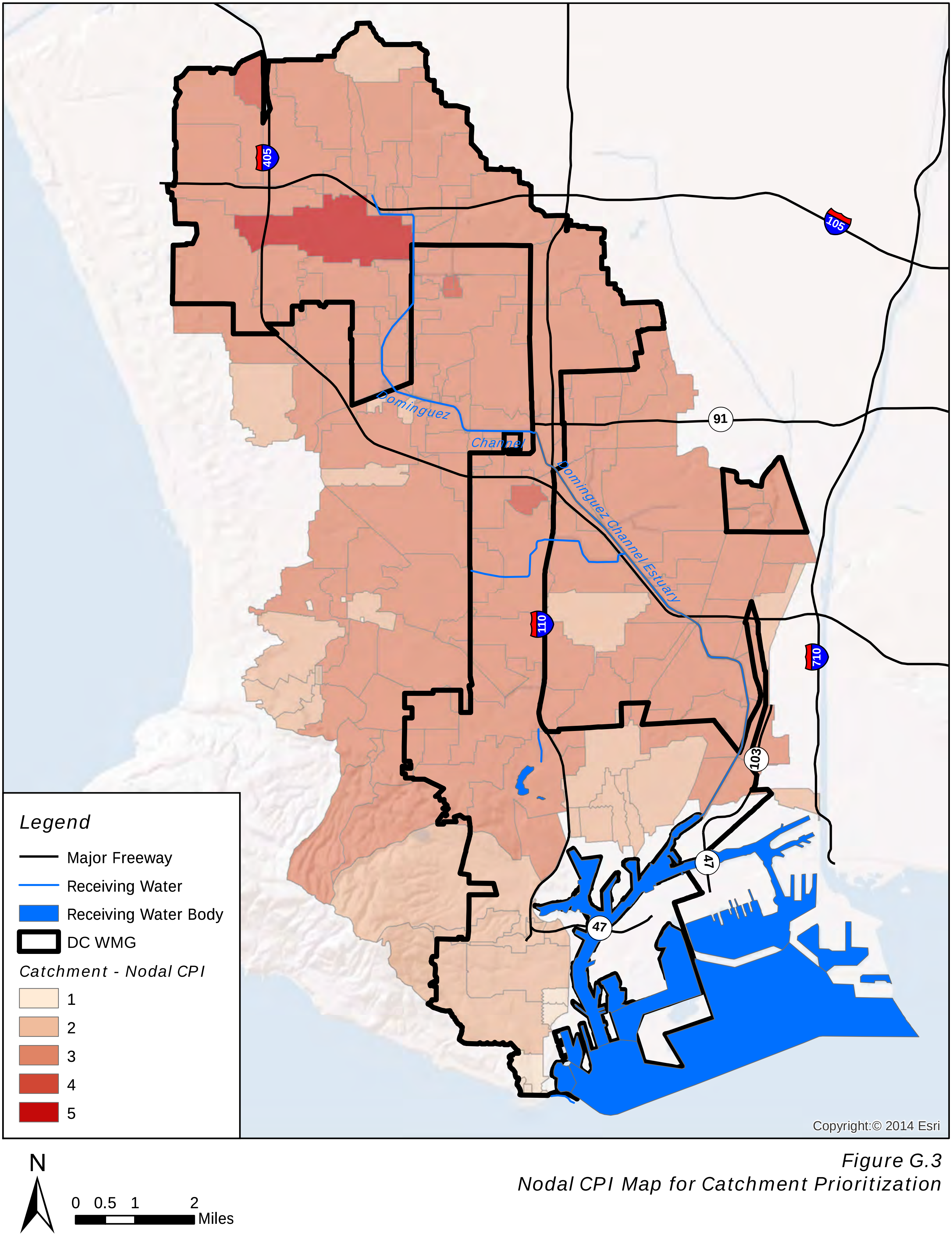

Figure G.3
Nodal CPI Map for Catchment Prioritization

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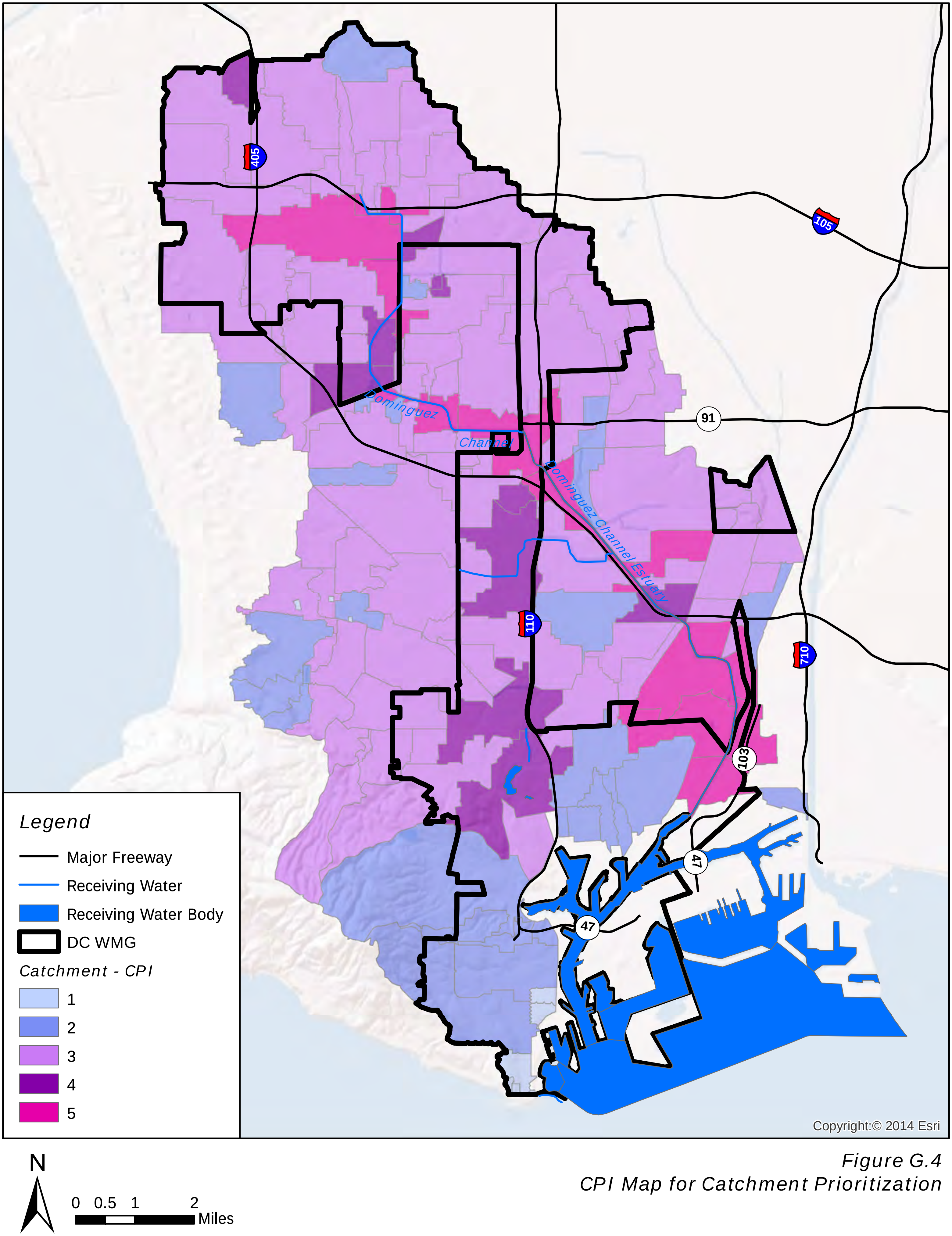

Figure G.4
CPI Map for Catchment Prioritization

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Attachment H

Industrial Facilities Covered Under the IGP in DC WMG

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This attachment includes a table summarizing the industrial facilities covered under the Industrial General Permit (IGP) within the Dominguez Channel Watershed Management Group (DC WMG), corresponding with Section 4.3 of the DC WMG Enhanced Watershed Management Program (EWMP). The table corresponds with Figure G.2 in Attachment G. Note that the postal addresses may designate a city that is not part of the DC WMG. However, the physical location, based on GIS mapping of the facilities, places them in one of the DC MWG agencies jurisdictions.

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Table H.1: Summary of Industrial Facilities Covered Under the IGP in DC WMG

Application ID	WDID	Status Date	Owner/Operator Name	Site/Facility Name	Address	City	WMG City	Zip Code	APN
188744	4 19I001069	3/25/1992	C Brite Metal Finishing Inc Joh	C Brite Co	1213 253rd St	Harbor City	City of Los Angeles	90710	7413006010
189722	4 19I007371	7/6/1993	Bryant Rubber Corp	Bryant Rubber Corp Steve Bryan	1112 Lomita Blvd	Harbor City	City of Los Angeles	90710	7413008018
190809	4 19I014945	2/11/1999	California Metals Recycling	CA Metals Recycling	1022 Lomita Blvd	Harbor City	City of Los Angeles	90710	7413017019
190226	4 19I011879	9/21/1995	Zachers Automotive Recycler	Zachers Automotive Recycler	25224 Vermont	Harbor City	City of Los Angeles	90710	7413020022
188939	4 19I002342	3/31/1992	Brea Canon Oil Co	Brea Canon Oil Co Joughin Facility	23903 Normandie	Harbor City	City of Los Angeles	90710	7438017013
323973	4 19I020849	4/27/2007	Plasticorp	Plasticorp	24105 24049 Frampton Ave	Harbor City	City of Los Angeles	90710	7439011037
370246	4 19I022300	8/31/2009	Plains Midstream Canada	Rancho LPG Holdings LLC	2110 N Gaffey St	San Pedro	City of Los Angeles	90731	7412026006
190642	4 19I014039	6/1/1998	Seaside Transportation Service	Marine Terminals Corp Yang Min	2050 John S Gibson Blvd # Bert	San Pedro	City of Los Angeles	90731	7440016911
188568	4 19I000231	3/2/1992	Yusen Terminal Inc	Yusen Terminal Inc	701 New Dock St	San Pedro	City of Los Angeles	90731	7440022911
433704	4 19I023989	12/27/2012	Catalina Express	Catalina Express	Berth 95	San Pedro	City of Los Angeles	90731	7440024911
189488	4 19I005178	4/8/1992	City of Los Angeles	Terminal Island WWTP	445 Ferry St	San Pedro	City of Los Angeles	90731	7440027914
190481	4 19I013131	6/25/1997	Eagle Marine Services Ltd	Eagle Marine Services Ltd	614 Terminal Way	San Pedro	City of Los Angeles	90731	7440028905
189709	4 19I007310	2/3/1993	US Coast Guard CO	US Coast Guard Support Ctr San Pedro	1001 S Seaside Ave	San Pedro	City of Los Angeles	90731	7440033903
191471	4 19I017765	1/21/2003	Southern California Ship Services	So Cal Ship Services	971 S Seaside Ave	San Pedro	City of Los Angeles	90731	7440033903
189857	4 19I009687	1/8/1993	Jankovich Co	Jankovich Co San Pedro Marine	Berth 74	San Pedro	City of Los Angeles	90731	7440034902
431612	4 19I023843	10/1/2012	SSA Marine	Outer Harbor Berths 54 and 55	Outer Harbor Berths 54 and 55	San Pedro	City of Los Angeles	90731	7440039910
191518	4 19I018069	4/8/2003	APM Terminals	APM Terminals	2500 Navy Way	San Pedro	City of Los Angeles	90731	7440042904
292961	4 19I019214	12/16/2004	BNSF Railway Company	Terminal Island	100 Navy Way	San Pedro	City of Los Angeles	90731	7440042904
189522	4 19I005602	12/20/2011	Defense Logistics Agency	US Defense Fuel Support Point	3171 N Gaffey St	San Pedro	City of Los Angeles	90731	7442001915
189308	4 19I004159	4/6/1992	Ciro Coppa	Coppa Woodworking	1231 Paraiso St	San Pedro	City of Los Angeles	90731	7445012047
331011	4 19I021125	9/5/2007	SA Recycling LLC	SA Recycling LLC dba SA Recycling of Los Angeles	901 New Dock St	Terminal Island	City of Los Angeles	90731	7440013907
422641	4 19I023444	12/15/2011	Progress Rail Services	United Industries Corp	710 Earle St	Terminal Island	City of Los Angeles	90731	7440029917
190173	4 19I011597	5/9/1995	Seaside Transportation Service	Evergreen Terminal	389 Terminal Wy	Terminal Island	City of Los Angeles	90731	7440029917
298504	4 19I020148	3/16/2006	Ardagh Metal Packaging USA Inc	Ardagh Metal Packaging USA Inc	936 Barracuda St	Terminal Island	City of Los Angeles	90731	7440029917
337275	4 19I021320	12/4/2007	General Petroleum Corporation	General Petroleum Corporation Terminal Island	1028 S Seaside Ave	Terminal Island	City of Los Angeles	90731	7440031906
340586	4 19I021437	2/6/2008	American Marine Corp	American Marine Corp	1500 S Barracuda St	Terminal Island	City of Los Angeles	90731	7440032905

Table H.1: Summary of Industrial Facilities Covered Under the IGP in DC WMG

Application ID	WDID	Status Date	Owner/Operator Name	Site/Facility Name	Address	City	WMG City	Zip Code	APN
410531	4 19I022958	12/27/2010	CA United Terminals	CA United Terminals	2525 Navy Wy	Terminal Island	City of Los Angeles	90731	7440042904
189105	4 19I003212	4/3/1992	California Cartage Co	CA Cartage Co	2401 E Pacific Coast Hwy	Wilmington	City of Los Angeles	90744	7315015905
332751	4 19I021192	10/4/2007	Tesoro Refining & Marketing Co	Tesoro Refining & Marketing Co	1930 Pacific Coast Hwy	Wilmington	City of Los Angeles	90744	7315017005
189766	4 19I009176	11/9/1992	GS Roofing dba CertainTeed RPG	GS Roofing dba CertainTeed RPG	1431 E	Wilmington	City of Los Angeles	90744	7412025009
188959	4 19I002397	3/31/1992	Brea Canon Oil Co	Brea Canon Oil Co South Torrance	630 Lomita	Wilmington	City of Los Angeles	90744	7414001902
190768	4 19I014799	12/5/1998	Honda and Toyota Auto Parts	Honda Toyota Auto Parts Dis	707 E Anaheim St	Wilmington	City of Los Angeles	90744	7416021035
190789	4 19I014881	12/31/1998	Car Aroma Supplies	Car Aroma Supplies	412 W Anaheim St	Wilmington	City of Los Angeles	90744	7416028004
347060	4 19I021624	6/18/2008	West Coast Aerospace Inc	West Coast Aerospace	220 W E St	Wilmington	City of Los Angeles	90744	7418005015
190153	4 19I011485	3/9/1995	Garcia Mario	C & G Auto Wrecking	516 Quay Ave	Wilmington	City of Los Angeles	90744	7418009023
347059	4 19I021625	6/18/2008	West Coast Aerospace Inc	West Coast Aerospace Inc	516 Marine St	Wilmington	City of Los Angeles	90744	7418015008
292925	4 19I018664	3/2/2004	Smart Recycling Inc	Smart Recycling Inc	424 426 N Fries Ave	Wilmington	City of Los Angeles	90744	7418015011
191519	4 19I018076	4/10/2003	Milans Honda	Milans Honda	225 E Harry Bridges Blvd	Wilmington	City of Los Angeles	90744	7418030015
337578	4 19I021327	12/5/2007	Marine Technical Services	Marine Technical Services	211 N Marine Ave	Wilmington	City of Los Angeles	90744	7418033907
188641	4 19I000538	3/16/1992	Wilmington Woodworks Inc	Wilmington Woodworks Inc	318 C St	Wilmington	City of Los Angeles	90744	7418034900
189939	4 19I010244	6/28/1993	Auto Recycling Wilmington I	Auto Recycling Wilmington I	418 E Anaheim St	Wilmington	City of Los Angeles	90744	7423015013
307626	4 19I020405	1/6/2014	Warren E and P Inc	Warren E and P Inc WTU	625 E Anaheim St	Wilmington	City of Los Angeles	90744	7423024032
293435	4 19I019979	12/19/2005	Royal Adhesives & Sealants LLC	Royal Adhesives & Sealants LLC	800 E Anaheim St	Wilmington	City of Los Angeles	90744	7424011056
431152	4 19I023817	9/14/2012	Potential Industries	Potential Industries	922 East E St	Wilmington	City of Los Angeles	90744	7424017043
425346	4 19I023570	3/20/2012	Shokri Sayegh	Nu Way Auto Dismantling Inc	1022 E Anaheim St	Wilmington	City of Los Angeles	90744	7424021006
370632	4 19I022314	9/9/2009	Ford Only Inc	Ford Only Inc	728 N Sanford Ave	Wilmington	City of Los Angeles	90744	7424021012
307192	4 19I020391	8/3/2006	Adrian Orozco	Motor Sport Auto Body	734 N Flint Ave	Wilmington	City of Los Angeles	90744	7424022008
190912	4 19I015333	8/12/1999	Quintanilla Maria	Mid Auto Dismantler & Sales	725 Watson Ave	Wilmington	City of Los Angeles	90744	7424023012
191313	4 19I017067	2/6/2002	Gil Perez	M G Auto Dismantlers	711 Watson Ave	Wilmington	City of Los Angeles	90744	7424023014
191420	4 19I017505	9/25/2002	Garcias Auto Sales & Dismantling Inc	Garcias Auto Dismantling	640 Flint Ave	Wilmington	City of Los Angeles	90744	7424024038
190299	4 19I012295	5/9/1996	Mikes Foreign Auto Parts	Mikes Foreign Auto Parts	921 E Anaheim St	Wilmington	City of Los Angeles	90744	7425011018
189482	4 19I005131	4/7/1992	Pick Your Partners Auto Wrecking	Pick Your Part Help Yourself	1232 Blinn Ave	Wilmington	City of Los Angeles	90744	7425026002
189087	4 19I003067	4/2/1992	Jacks Foreign Auto Wrecking	Jacks Foreign Auto Wrecking	1019 E Anaheim St	Wilmington	City of Los Angeles	90744	7425037015

Table H.1: Summary of Industrial Facilities Covered Under the IGP in DC WMG									
Application ID	**WDID**	**Status Date**	**Owner/Operator Name**	**Site/Facility Name**	**Address**	**City**	**WMG City**	**Zip Code**	**APN**
440599	4 19I024417	8/19/2013	Davilas Enterprise LLC	4 Wheel Dismantling	1034 Cristobal Ave	Wilmington	City of Los Angeles	90744	7425042009
366197	4 19I022175	6/3/2009	Howdy Auto Dismantler Inc	Howdy Auto Dismantler	1018 Alameda St	Wilmington	City of Los Angeles	90744	7425042021
190157	4 19I011502	3/14/1995	Liberty Auto Sales & Dismantling	Liberty Auto Sales & Dismantling	1542 E Opp St	Wilmington	City of Los Angeles	90744	7425043024
190269	4 19I012137	2/7/1996	Japanese Truck Dismantling	Japanese Truck Dismantling	940 Alameda St	Wilmington	City of Los Angeles	90744	7425043045
190840	4 19I015054	4/8/1999	Blanco Engine Core	Blanco Engine Core	925 Henry Ford	Wilmington	City of Los Angeles	90744	7425043050
442792	4 19I024557	11/14/2013	Roland A Molina	Blanco Auto Wrecking and Repair	925 N Henry Ford Ave	Wilmington	City of Los Angeles	90744	7425043050
191013	4 19I015737	4/12/2000	Juan Cerna	4 Stars Auto Dismantler Sales	921 N Henry Ford Ave	Wilmington	City of Los Angeles	90744	7425043055
435549	4 19I024124	3/5/2013	Commercial Truck Used Parts	Commercial Truck Used Parts	1523 East I Street	Wilmington	City of Los Angeles	90744	7425043057
189443	4 19I004915	4/7/1992	International Cargo Equipment	International Cargo Equipment	1540 Eubank Ave	Wilmington	City of Los Angeles	90744	7426001013
189114	4 19I003269	4/3/1992	Norwalk Industries Co	Ecology Auto Wrecking	1000 Lomita	Wilmington	City of Los Angeles	90744	7426001014
190462	4 19I012997	3/19/1997	BNSF Railway Co	BNSF Railway Watson	1302 Lomita	Wilmington	City of Los Angeles	90744	7426001808
315179	4 19I020571	11/27/2006	Martin Container Inc	Martin Container Inc	1402 E Lomita Blvd	Wilmington	City of Los Angeles	90744	7426006001
189430	4 19I004876	4/7/1992	AMC Auto Salvage	AMC Auto Salvage	1310 E Lomita Blvd	Wilmington	City of Los Angeles	90744	7426006016
189484	4 19I005133	4/7/1992	Pick Your Partners Auto Wrecking	Pick Your Part	1903 Blinn Ave	Wilmington	City of Los Angeles	90744	7426007001
324019	4 19I020852	4/27/2007	Estes Express West	GI Trucking Co dba Estes West	1531 Blinn Ave	Wilmington	City of Los Angeles	90744	7426007002
189167	4 19I003490	4/3/1992	Ace High Truck	Ace High Truck	1305 Sandison	Wilmington	City of Los Angeles	90744	7426008034
410443	4 19I022956	12/23/2010	Ruben Chavez	West Coast Dismantlers	1523 E Sandison St	Wilmington	City of Los Angeles	90744	7426024038
442369	4 19I024542	10/28/2013	Maria Leticia Urias Alfonso Urias Alfonso Hijinio Urias Junior	Tex Auto Wrecking	1549 East Sandison Street	Wilmington	City of Los Angeles	90744	7426024043
293027	4 19I019352	3/16/2005	Juniors Auto Parts	Juniors Auto Parts	1535 E Sandison St	Wilmington	City of Los Angeles	90744	7426024054
191190	4 19I016559	6/5/2001	Valero Refining Co California	Valero Refining Co CA	1651 Alameda St	Wilmington	City of Los Angeles	90744	7426028005
190946	4 19I015482	11/9/1999	Paramount Forge Inc	Paramount Forge Inc	1721 E Colon St	Wilmington	City of Los Angeles	90744	7426031023
189238	4 19I003787	4/3/1992	Action Sales & Metal Co	Action Sales & Metal Co	1625 E Pacific Coast Hwy	Wilmington	City of Los Angeles	90744	7426033030
345563	4 19I021575	5/27/2008	New Bone Inc DBA Boneyard Auto Parts	New Bone Inc DBA Boneyard Auto Parts	1807 E M St	Wilmington	City of Los Angeles	90744	7428002009
191050	4 19I015957	7/19/2000	Wilmington Auto Wrecking	Wilmington Auto Wrecking	1817 M	Wilmington	City of Los Angeles	90744	7428002012
365982	4 19I022166	5/29/2009	Tonys Vette Inc	Tonys Vette Inc	1818 E Mauretania St	Wilmington	City of Los Angeles	90744	7428002026
191613	4 19I018414	10/16/2003	Martinez Engine Cores	Martinez Engine Cores	1814 E Mauretania St	Wilmington	City of Los Angeles	90744	7428002027
426005	4 19I023594	4/10/2012	Elvira Mercedes Lezama Ruiz	CL Auto Parts & Dismantling	1714 E Mauretania St	Wilmington	City of Los Angeles	90744	7428002031
190970	4 19I015579	1/12/2000	Lincoln Iron & Metals	Lincoln Iron & Metals	1262 Alameda St	Wilmington	City of Los Angeles	90744	7428002037
189244	4 19I003826	4/3/1992	Alco Truck & Auto Inc	Alco Truck & Van Parts	1230 Alameda St	Wilmington	City of Los Angeles	90744	7428003003

Table H.1: Summary of Industrial Facilities Covered Under the IGP in DC WMG

Application ID	WDID	Status Date	Owner/Operator Name	Site/Facility Name	Address	City	WMG City	Zip Code	APN
426874	4 19I023621	5/7/2012	Recycling Unlimited Metal Co	Recycling Unlimited Metal Co	1813 E Robidoux St	Wilmington	City of Los Angeles	90744	7428003015
428728	4 19I023699	7/2/2012	Wilmington Recycling Group LLC	Wilmington Recycling Group LLC	1248 Alameda St	Wilmington	City of Los Angeles	90744	7428003048
191263	4 19I016818	9/25/2001	Moine Charles A	Wilmington Recyclers	1120 Henry Ford	Wilmington	City of Los Angeles	90744	7428005025
189495	4 19I005229	4/9/1992	Savage Industries Inc	Savage Industries Inc	1635 E Denni St	Wilmington	City of Los Angeles	90744	7428005028
303010	4 19I020236	5/30/2006	Clean Harbors Wilmington LLC	Clean Harbors Wilmington LLC	1737 E Denni St	Wilmington	City of Los Angeles	90744	7428006006
326777	4 19I020937	6/20/2007	Tesoro Refining and Marketing Company LLC	Tesoro Los Angeles Refinery	2101 E Pacific Coast Highway	Wilmington	City of Los Angeles	90744	7428007009
189047	4 19I002849	4/2/1992	VOPAK Terminal Los Angeles Inc	Vopak Terminal Los Angeles Inld	2200 Pacific Coast	Wilmington	City of Los Angeles	90744	7428007009
190640	4 19I014013	5/21/1998	Penzoil Quaker State Co SOPUS Products	Sopus Prod LA Lubes Plant	1926 E Pacific Coast Hwy	Wilmington	City of Los Angeles	90744	7428007010
188733	4 19I001017	3/23/1992	Praxair Inc	Praxair Inc	2300 E Pacific Coast Hwy	Wilmington	City of Los Angeles	90744	7428008905
190102	4 19I011272	11/22/1994	Apple Auto Dismantling Inc	Apple Auto Dismantling	2701 Anaheim	Wilmington	City of Los Angeles	90744	7428014029
191317	4 19I017082	2/6/2002	Rugerio Moises	Chicos Auto Wrecking	905 Farragut Ave	Wilmington	City of Los Angeles	90744	7428015030
191614	4 19I018415	10/16/2003	B & R Auto Dismantling	B & R Auto Dismantling	902 Foote Ave	Wilmington	City of Los Angeles	90744	7428017940
191154	4 19I016406	3/16/2001	AJC Sandblasting Inc	AJC Sandblasting Inc	932 Schley	Wilmington	City of Los Angeles	90744	7428019064
358274	4 19I021964	12/19/2008	Astro Auto Wrecking	Astro Auto Wrecking	1002 Schley Ave	Wilmington	City of Los Angeles	90744	7428019066
190453	4 19I012926	2/20/1997	Guadalupe Rivas	Lupes Auto Sales & Dismantling	918 Schley	Wilmington	City of Los Angeles	90744	7428019092
191194	4 19I016573	6/11/2001	Pacific Auto Dismantler LLC LRP	Pacific Auto Dismantler	2423 E Anaheim St	Wilmington	City of Los Angeles	90744	7428020023
190354	4 19I012541	9/6/1996	M & R Auto Sales	M & R Auto Sales	820 Macdonough Ave	Wilmington	City of Los Angeles	90744	7428020029
191002	4 19I015698	3/23/2000	Olmedos Auto Sales Dismantler	Olmedos Auto Sales Dismantler	828 Macdonough Ave	Wilmington	City of Los Angeles	90744	7428020029
191040	4 19I015917	7/6/2000	Barillas Nicolas	Nicks Auto Wrecking	2211 E Anaheim St	Wilmington	City of Los Angeles	90744	7428021049
439672	4 19I024363	7/16/2013	Anoosh Dayani	Harbor Auto LLC	2223 E Anaheim Street	Wilmington	City of Los Angeles	90744	7428021050
188667	4 19I000668	1/12/1993	HJ Baker & Bro Inc	H J Baker & Bro Inc	1001 Schley Ave	Wilmington	City of Los Angeles	90744	7428022903
306858	4 19I020378	7/27/2006	Warren E & P Inc	Warren E & P Inc	2209 E I St	Wilmington	City of Los Angeles	90744	7428023050
409668	4 19I022930	12/3/2010	Rafael Ruiz Sanchez	Sanchez Auto Service Dismantling	2113 E I St	Wilmington	City of Los Angeles	90744	7428024001
429198	4 19I023724	7/17/2012	G M B Auto Sales & Dismantling	G M B Auto Sales & Dismantling	1008 Vreeland Ave	Wilmington	City of Los Angeles	90744	7428030005
189424	4 19I004763	4/7/1992	Vanderwerff Chip	Alle Auto Wrecking	1710 E Opp St	Wilmington	City of Los Angeles	90744	7428033042
412771	4 19I023050	3/7/2011	Luis Castro and Pablo Rene Cruz	Element Auto Dismantling	1800 E Opp St	Wilmington	City of Los Angeles	90744	7428034020
411829	4 19I023015	2/9/2011	Shoreline Auto Wrecking	Shoreline Auto Wrecking	911 S Vreeland Ave	Wilmington	City of Los Angeles	90744	7428034031
432146	4 19I023876	10/19/2012	Titos Auto Dismantling and Used	Titos Auto Dismantling and Used	1801 East I Street	Wilmington	City of Los Angeles	90744	7428034036
190162	4 19I011535	4/6/1995	Medrano George	George S Body Shop Auto Sales	927 Vreeland Ave	Wilmington	City of Los Angeles	90744	7428034906

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Application ID	**WDID**	**Status Date**	**Owner/Operator Name**	**Site/Facility Name**	**Address**	**City**	**WMG City**	**Zip Code**	**APN**
191716	4 19I018761	4/29/2004	Aguar Auto Dismantling	Aguar Auto Dismantling	908 Vreeland Ave	Wilmington	City of Los Angeles	90744	7428035018
191744	4 19I018854	6/23/2004	I De L Auto Dismantling	I De L Auto Dismantling	1907 E I St	Wilmington	City of Los Angeles	90744	7428035020
441218	4 19I024461	9/13/2013	William Miranda	Idel Auto Dismantling and Body Work	1907 East I Street	Wilmington	City of Los Angeles	90744	7428035021
190464	4 19I013005	3/19/1997	Salvador Danny	Danny Auto Dismantling	1919 I	Wilmington	City of Los Angeles	90744	7428035025
402387	4 19I022548	3/3/2010	Walid Jahchan	WJ Auto Wrecking Inc Wally Auto Dismantling	942 N Vreeland Ave	Wilmington	City of Los Angeles	90744	7428035039
327168	4 19I020955	6/29/2007	Robertos Auto Dismantler	Robertos Auto Dismantler	912 Vreeland Ave	Wilmington	City of Los Angeles	90744	7428035046
293255	4 19I019816	10/11/2005	Tension Member Technology	Coordinated Equipment Co	1707 E Anaheim St	Wilmington	City of Los Angeles	90744	7428036045
443539	4 19I024612	12/31/2013	Manson Construction Co	Manson Construction Co	Berth 200 611 Henry Ford	Wilmington	City of Los Angeles	90744	7440001912
293285	4 19I019868	10/31/2005	Air Product & Chemicals	Air Products & Chemicals Inc	700 N Henry Ford Ave	Wilmington	City of Los Angeles	90744	7440002034
189346	4 19I004312	4/6/1992	Tidelands Oil Production Co	Tidelands Oil Production Co	420 Henry Ford	Wilmington	City of Los Angeles	90744	7440004271
189491	4 19I005196	4/9/1992	Los Angeles Department of Water and Power Power	Harbor Generating Station	161 Island	Wilmington	City of Los Angeles	90744	7440006911
188702	4 19I000868	3/23/1992	Trans Pacific Container	Trans Pac Container	920 W Harry Bridges Blvd	Wilmington	City of Los Angeles	90744	7440008901
189576	4 19I006177	4/22/1992	Catalina Freight Line	Catalina Freight Line	100 W Water St	Wilmington	City of Los Angeles	90744	7440009911
189048	4 19I002850	4/2/1992	VOPAK Terminal Los Angeles Inc	Vopak Terminal Los Angeles	401 Canal	Wilmington	City of Los Angeles	90744	7440010910
188808	4 19I001436	3/27/1992	Colonial Yacht Anchorage	Colonial Yacht Anchorage	Berth 204 Anchorage Rd	Wilmington	City of Los Angeles	90744	7440011908
368978	4 19I022242	7/28/2009	Associated Pacific Contructors Inc.	APC Berth 193	325 Yacht St	Wilmington	City of Los Angeles	90744	7440013909
191604	4 19I018386	9/30/2003	Cerritos Yacht Anchorage	Cerritos Yacht Anchorage	205 Berth Ste C	Wilmington	City of Los Angeles	90744	7440014904
189064	4 19I002928	4/2/1992	Pasha Stevedoring & Terminal	Pasha Stevedoring & Terminal	802 S Fries Ave	Wilmington	City of Los Angeles	90744	7440014904
324960	4 19I020888	5/16/2007	Shore Terminals LLC	Shore Terminals LLC	841 La Paloma Ave	Wilmington	City of Los Angeles	90744	7440014904
189009	4 19I002660	4/1/1992	US Borax Inc	U S Borax	300 Falcon	Wilmington	City of Los Angeles	90744	7440019001
432128	4 19I023869	10/19/2012	Impresa Aerospace LLC	Impresa Aerospace LLC	344 W 157th Street	Gardena	Unincorporated	90248	6125001002
410489	4 19I022954	12/22/2010	RJs Demolition & Disposal	RJs Chipping & Grinding	355 W Alondra Blvd	Gardena	Unincorporated	90248	6125001012
346405	4 19I021608	6/10/2008	Environmental Recovery Services Inc	Environmental Recovery Services Inc	15902 S Main St	Gardena	Unincorporated	90248	6125003003
190973	4 19I015609	2/1/2000	Bay Cities Metal Production	Bay Cities Metal Production	301 E Alondra Blvd	Gardena	Unincorporated	90248	6125004006
189616	4 19I006362	4/24/1992	Northrop Grumman Corp	Northrop Grumman Mil Air Sys	1 Hornet	El Segundo	El Segundo	90245	4138002901
191274	4 19I016870	10/17/2001	CoorsTek	Coors Tek	2051 E Maple Ave	El Segundo	El Segundo	90245	4138005016
189564	4 19I006091	4/21/1992	The Boeing Company	The Boeing Company	2060 E Imperial Hwy	El Segundo	El Segundo	90245	4138005067

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Application ID	WDID	Status Date	Owner/Operator Name	Site/Facility Name	Address	City	WMG City	Zip Code	APN
190113	4 19I011326	12/29/1994	CalPortland Co	Catalina Pacific Concrete Co	339 S Aviation Blvd	El Segundo	El Segundo	90245	4138008002
439562	4 19I024358	7/11/2013	Carlisle Interconnect Tech Inc	Tri Star Electronics Intl Inc	2201 Rosecrans Ave	El Segundo	El Segundo	90245	4138011011
339622	4 19I021413	1/16/2008	Raytheon Co	Raytheon Co	2000 E El Segundo Blvd	El Segundo	El Segundo	90245	4138014047
190263	4 19I012074	1/3/1996	West Basin MWD	West Basin Mun Water Dist Recl	1935 Hughes	El Segundo	El Segundo	90245	4138014906
189128	4 19I003356	4/3/1992	Air Product & Chemicals	Air Prod & Chemicals	2021 Rosecrans Ave	El Segundo	El Segundo	90245	4138015012
339623	4 19I021414	1/16/2008	Raytheon Co	Raytheon Co	2030 E Maple Ave	El Segundo	El Segundo	90245	4138019001
188987	4 19I002527	4/1/1992	Mattel Toys	Mattel Toys Design Ctr	2031 E Mariposa Ave	El Segundo	El Segundo	90245	4138019002
191530	4 19I018105	4/28/2003	California Waste Services LLC	California Waste Services LLC	621 152nd	Gardena	City of Los Angeles	90247	6120001017
188950	4 19I002372	3/31/1992	Harbor Auto Liquidators	U Pick U Save	17800 S Vermont Ave	Gardena	City of Los Angeles	90248	6121019005
190810	4 19I014946	2/11/1999	California Metals Recycling	CA Metals Recycling	833 W 182nd St	Gardena	City of Los Angeles	90248	6121019009
190096	4 19I011249	11/1/1994	Los Angeles Unified School District	LA Unified Sch Dist Gardena Ga	18421 S Hoover St	Gardena	City of Los Angeles	90248	6121020904
189659	4 19I006973	5/15/1992	Cast Rite Corp	Cast Rite Corp	515 E Airline Way	Gardena	Unincorporated	90248	6125011028
423791	4 19I023491	1/30/2012	Umair Syed	Fastener Innovation Tech	14601 S Broadway	Gardena	Unincorporated	90248	6129001047
189782	4 19I009247	11/11/1992	Binder Metal Product Inc	Binder Metal Prod Inc	14909 S Broadway St	Gardena	Unincorporated	90248	6129002018
298183	4 19I020140	3/10/2006	Waste Resources Recovery Inc	Waste Resources Recovery	357 Compton	Gardena	Unincorporated	90248	6129002029
433466	4 19I023969	1/22/2014	Metric Precision	Metric Precision	350 W Compton Blvd	Gardena	Unincorporated	90248	6129003010
293088	4 19I019473	5/5/2005	Designed Metal Connections	Designed Metal Connections	14800 S Figueroa St	Gardena	City of Los Angeles	90248	6129001046
189130	4 19I003359	4/3/1992	Westway Auto Dismantlers	Westway Auto Dismantlers	15414 S Figueroa St	Gardena	Unincorporated	90248	6129004014
304186	4 19I020268	6/5/2006	Gerald Tupper	American Aircraft Products	15411 S Broadway Ave	Gardena	Unincorporated	90248	6129004029
189310	4 19I004162	4/6/1992	Huniu Norman	Capital Auto Wrecking	15326 S Figueroa St	Gardena	Unincorporated	90248	6129004033
191446	4 19I017633	11/18/2002	Grow More Inc	Grow More Inc	15600 New Century Dr	Gardena	Unincorporated	90248	6129005045
432837	4 19I023928	11/16/2012	Rex Foreign Used Auto Parts	Rex Foreign Used Auto Parts	15601 S Main St	Gardena	Unincorporated	90248	6129006023
307772	4 19I020413	8/16/2006	Sanchez Auto Wrecking	Sanchez Auto Wrecking	15503 1/2 Main	Gardena	Unincorporated	90248	6129006033
400870	4 19I022416	11/23/2009	MDH Auto Wrecking	MDH Auto Wrecking	15503 3/4 S Main St	Gardena	Unincorporated	90248	6129006033
402718	4 19I022570	3/24/2010	Main St Auto Dismantlers Inc	Main St Auto Dismantlers Inc	15503 S Main St	Gardena	Unincorporated	90248	6129006033
189680	4 19I007120	6/2/1992	A & A Ready Mixed Concrete	A&A Ready Mixed Concrete	100 Redondo Beach	Gardena	Unincorporated	90248	6129007017
189682	4 19I007122	6/2/1992	A & A Ready Mixed Concrete	A&A Ready Mixed Concrete	134 Redondo Beach	Gardena	Unincorporated	90248	6129007017
189335	4 19I004271	4/6/1992	Coast Plating	Coast Plating Co	128 W 154th St # 150	Gardena	Unincorporated	90248	6129007035
322389	4 19I020739	3/23/2007	Lite Extrusions Mfg	Lite Extrusions Mfg	15025 S Main St	Gardena	Unincorporated	90248	6129008038

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323958	4 19I020839	4/25/2007	Amfoam Inc	American Foam & Packaging	15110 S Broadway	Gardena	Unincorporated	90248	6129008044
188533	4 19I000043	2/10/1992	Mechanical Metal Finishing	Mechanical Metal Finishing	15220 S Broadway St	Gardena	Unincorporated	90248	6129008050
410815	4 19I022992	1/27/2011	Gamma 2	Gamma 2	14505 S Main St	Gardena	Unincorporated	90248	6129009048
188864	4 19I001829	3/30/1992	Superior Gear Facility	Superior Gear Facility	14814 Broadway	Gardena	Unincorporated	90248	6129009065
191717	4 19I018765	4/30/2004	JB Chemical Co Inc	J B Chemical Co Inc	14803 S Spring St	Gardena	Unincorporated	90248	6129009072
189441	4 19I004906	4/7/1992	Any Kar Auto Dismantling	Any Kar Auto Dismantling	150 W Lennon St	Gardena	Unincorporated	90248	6129009075
188928	4 19I002282	3/31/1992	TCI Precision Metals	TCI Precision Metals	240 E Rosecrans Ave	Gardena	Unincorporated	90248	6129010036
401870	4 19I022501	1/27/2010	Proplas Technologies	Proplas Technologies	14600 S Main St	Gardena	Unincorporated	90248	6129010040
370140	4 19I022330	9/17/2009	Ecology Auto Parts Inc	Ecology Auto Parts Inc	14701 S Maple	Gardena	Unincorporated	90248	6129010041
351216	4 19I021762	8/25/2008	Richard Hough	Cosway Company	14805 S Maple	Gardena	Unincorporated	90247	6129011020
191688	4 19I018650	2/25/2004	Carson Trailer	Carson Trailer inc	14831 S Maple Ave	Gardena	Unincorporated	90248	6129011021
189640	4 19I006665	7/9/1993	Mills Iron Works	Mills Iron Works	14834 S Maple Ave	Gardena	Unincorporated	90248	6129011027
403279	4 19I022633	5/13/2010	Maya Steel Fabrications Inc	Maya Steel Fabrications Inc	301 E Compton Blvd	Gardena	Unincorporated	90248	6129011030
189502	4 19I005353	4/10/1992	Allied Waste Services of North America LLC	Gardena Hauling	14905 S San Pedro Street	Gardena	Unincorporated	90248	6129011040
434520	4 19I024036	1/30/2013	Samuel Cohen	Vege Misting Alco Designs	407 E Redondo Beach Blvd	Gardena	Unincorporated	90248	6129014037
189746	4 19I009076	11/7/1992	Blue Daisy Cement Product	Blue Daisy Cement Prod	314 E Compton Blvd	Gardena	Unincorporated	90248	6129015049
293047	4 19I019382	3/23/2005	FedEx Freight	Fedex Freight Gardena	15200 S Main St	Gardena	Unincorporated	90248	6129018054
189395	4 19I004554	4/8/1992	Angelus Block Co Inc	Angelus Block Co Inc	252 E Redondo Beach Blvd	Gardena	Unincorporated	90248	6129019053
189092	4 19I003126	4/2/1992	YRC Freight	YRC Inc	15400 S Main St	Gardena	Unincorporated	90248	6129019057
190664	4 19I014209	11/29/2012	Hubbard Casting Co Inc	Hubbard Casting Co Inc	127 E 157th St	Gardena	Unincorporated	90248	6129020035
189944	4 19I010285	7/8/1993	Thomas Auto Salvage	Thomas Auto Salvage	440 E Redondo Beach Blvd	Gardena	Unincorporated	90248	6129021031
189729	4 19I008028	9/26/1992	Letvin Ronald A	S Letvin & Son	13210 S Figueroa Steet	Los Angeles	Unincorporated	90248	6132008020
191316	4 19I017076	2/6/2002	Stepstone Inc	Stepstone Inc Plant No 3	13238 S Figueroa St	Los Angeles	Unincorporated	90061	6132008038
403688	4 19I022657	6/1/2010	River Star Inc	River Star Inc	378 W 133rd St	Los Angeles	Unincorporated	90061	6132009001
188651	4 19I000584	3/16/1992	Als Plating Co Inc	Al S Plating Co Inc	318 W 131st St	Los Angeles	Unincorporated	90061	6132011016
293279	4 19I019852	10/21/2005	Nasco Aircraft Brake Inc	Nasco Aircraft Brake Inc	13300 Estrella Ave	Gardena	City of Los Angeles	90248	6132004029
363241	4 19I022095	4/1/2009	Connector Plating Corp	Connector Plating Corp	327 W 132nd St	Los Angeles	Unincorporated	90061	6132011022
190485	4 19I013149	6/25/1997	Phillips 66 Company	Phillips 66 Company LA Terminal	13500 S Broadway	Los Angeles	Unincorporated	90061	6132042022
336892	4 19I021302	11/28/2007	D&D Palstics Inc	D&D Palstics Inc	13920 S Figueroa	Los Angeles	Unincorporated	90061	6132044007
191454	4 19I017672	12/9/2002	Robertsons Ready Mix	Robertsons Ready Mix Gardena	301 Rosecrans	Gardena	Unincorporated	90248	6132044033
190177	4 19I011620	5/30/1995	Parkers Towing & Salvage Inc	Parker S Towing & Salvage Inc	14116 Avalon Blvd	Los Angeles	Unincorporated	90061	6134018039
188732	4 19I001009	3/23/1992	V & M Plating Co	V & M Plating Co	14024 Avalon Blvd	Los Angeles	Unincorporated	90061	6134018056

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190142	4 19I011444	2/27/1995	Hi Craft Metal Product	Hi Craft Metal Prod	606 W 184th St	Gardena	City of Los Angeles	90248	7339008029
190120	4 19I011370	1/25/1995	Scotch Paint	Scotch Paint	555 W 189th St	Gardena	City of Los Angeles	90248	7339008030
190311	4 19I012361	6/4/1996	Spectrum Laboratory Product Inc	Spectrum Laboratory Prod Inc	14422 S San Pedro St	Gardena	Unincorporated	90248	6137001004
189698	4 19I007219	6/18/1992	International Die Casting	International Die Casting	14733 Avalon	Gardena	Unincorporated	90248	6137002019
191221	4 19I016662	7/25/2001	OSI Optoelectronics Inc	Udt Sensors Inc	12525 Chadron Ave	Hawthorne	Hawthorne	90250	4049007042
190566	4 19I013631	12/30/1997	Fed Ex	Fed Ex	12600 Prairie Ave	Hawthorne	Hawthorne	90250	4049011017
405512	4 19I022728	7/19/2010	Triumph Aerostructures LLC	Triumph Aerostructures Hawthorne	3901 Jack Northrop Ave	Hawthorne	Hawthorne	90250	4049013004
188930	4 19I002294	3/31/1992	Hawthorne City	Hawthorne City Airport	12101 Crenshaw Blvd	Hawthorne	Hawthorne	90250	4049017905
424943	4 19I023543	3/6/2012	Space Exploration Technologies	Space Exploration Technologies	1 Rocket Rd	Hawthorne	Hawthorne	90250	4049019013
443973	4 19I024648	1/23/2014	Arrow Recycling Solutions Inc	Arrow Recycling Solutions Inc	12410 Wilkie Ave	Hawthorne	Hawthorne	90250	4056032045
188701	4 19I000862	3/23/1992	Interplastic Corp	Interplastic Corp	12335 S Van Ness Ave	Hawthorne	Hawthorne	90250	4056032051
293257	4 19I019821	10/12/2005	Hollywood Park Land Co LLC	Hollywood Park Racetrack	1050 S Prairie Ave	Inglewood	Inglewood	90301	4025011037
293147	4 19I019606	6/28/2005	UPS Cartage Services Inc	UPS Cartage Services Inc CAIWD	3600 W Century Blvd	Inglewood	Inglewood	90303	4032004045
189311	4 19I004165	4/6/1992	Chromplate Co Inc	Chromplate Co Inc	1127 W Hillcrest Blvd	Inglewood	Inglewood	90301	4126003013
188819	4 19I001526	3/27/1992	Rho Chem LLC	Rho Chem LLC	425 Isis Ave	Inglewood	Inglewood	90301	4126003020
188945	4 19I002358	3/31/1992	Microplate Inc	Microplate Inc	1013 W Hillcrest Blvd	Inglewood	Inglewood	90301	4126006011
189658	4 19I006958	5/14/1992	Standun Inc	Zephyr Manufacturing	201 Hindry Ave	Inglewood	Inglewood	90301	4127029001
190221	4 19I011858	9/6/1995	LACMTA	Metro Division 22 Green Line	14724 Aviation Blvd	Lawndale	Hawthorne	90260	4149011910
190630	4 19I013944	4/30/1998	Union Pacific Railroad	ICTF	2401 E Sepulveda Blvd	Long Beach	City of Los Angeles	90810	7315011804
338208	4 19I021353	12/20/2007	Mortimer & Wallace Inc	Mortimer & Wallace Inc	2422 E Sepulveda Blvd	Long Beach	City of Los Angeles	90810	7315015905
189775	4 19I009217	11/10/1992	Merle Norman	Norman Merle	9130 Bellanca Ave	Los Angeles	City of Los Angeles	90045	4125010015
189959	4 19I010364	7/22/1993	Neutrogena	Neutrogena	5755 W 96th St	Los Angeles	City of Los Angeles	90045	4125021030
292954	4 19I019183	12/7/2004	National Technical Systems Inc	National Technical Systems Inc	5320 W 104th St	Los Angeles	City of Los Angeles	90045	4129035022
321914	4 19I020720	3/9/2007	CalPortland Co	Catalina Pacific Concrete Co	5299 W 111th St	Los Angeles	City of Los Angeles	90045	4129036908
191835	4 19I019135	12/1/2004	Moonlight Molds Inc	Moonlight Molds Inc	14920 S San Pedro St	Gardena	Unincorporated	90248	6137003015
190823	4 19I014999	3/12/1999	Chemtrans	Chemtrans	14700 S Avalon Blvd	Gardena	Unincorporated	90248	6137005005
190121	4 19I011377	1/26/1995	First Student Inc co Strata Env	First Student Inc 12477	14800 S Avalon Blvd	Gardena	Unincorporated	90248	6137005029
418710	4 19I023288	8/10/2011	CRM CO LLC H Barry Takallou	CRM CO LLC	15800 Avalon Blvd	Rancho Dominguez	Unincorporated	90220	6139013006
402389	4 19I022550	3/4/2010	Golden Gate Steel Inc	Golden Gate Steel Inc	19826 S Alameda St	Los Angeles	Unincorporated	90221	7306006034
189785	4 19I009280	11/13/1992	Nabors Completion & Production	Nabors Completion & Production	19431 S Santa Fe Ave	Rancho Dominguez	Unincorporated	90221	7306017007

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191325	4 19I017122	3/11/2002	General Petroleum Corporation	General Petroleum Rancho Dominguez	19501 S Santa Fe Ave	Rancho Dominguez	Unincorporated	90221	7306017012
190590	4 19I013713	1/23/1998	TA Davies Co	Ta Davies Co	19500 S Alameda St	Compton	Unincorporated	90221	7306017013
430619	4 19I023799	8/29/2012	First Transit Inc	First Transit Inc 55580	2727 E Del Amo Blvd	Compton	Unincorporated	90221	7306018042
431624	4 19I023845	10/1/2012	Fargo Trucking Co Inc	Fargo Trucking Co Inc	2727 E Del Amo Blvd	Rancho Dominguez	Unincorporated	90221	7306018042
191053	4 19I015979	7/31/2000	Plaskolite West Inc	Plaskolite West Inc	2225 Del Amo	Compton	Unincorporated	90220	7318007034
425138	4 19I023557	3/13/2012	Quality Forming LLC	Quality Forming LLC	22906 Frampton Ave	Torrance	City of Los Angeles	90501	7347018009
340590	4 19I021438	2/11/2008	Sims Recycling Solutions	Sims Recycling Solutions	20212 S Rancho Way	Rancho Dominguez	Unincorporated	90220	7318007043
191845	4 19I019159	12/2/2004	MK Diamond Product	MK Diamond Prod	1315 Storm Pkwy	Torrance	City of Los Angeles	90501	7347018034
189361	4 19I004385	4/6/1992	Farmer Bros Co	Farmer Bros Co	20333 Normandie Ave	Torrance	City of Los Angeles	90502	7351020021
191802	4 19I019016	9/7/2004	Rolling Frito Lay Sales	LA Mega	1500 Francisco St	Torrance	City of Los Angeles	90501	7351021039
190380	4 19I012624	10/30/1996	Ecology Control Industries	Ecology Control Industries	20846 Normandie	Torrance	City of Los Angeles	90502	7351027001
439786	4 19I024407	8/9/2013	Pellico Investments LLC	Laclede Inc	2103 East University Drive	Rancho Dominguez	Unincorporated	90220	7318009028
443596	4 19I024619	1/3/2014	AGC Automotive California Inc	AGC Automotive California Inc	19301 Pacific Gateway Drive	Torrance	City of Los Angeles	90502	7351031007
189132	4 19I003373	4/3/1992	RR Donnelley	RR Donnelley LA Div	19681 Pacific Gateway Dr	Torrance	City of Los Angeles	90502	7351034015
191503	4 19I017993	3/18/2003	Ace Clearwater Ent	Ace Clearwater Ent	19815 Magellan Dr	Torrance	City of Los Angeles	90502	7351034043
189628	4 19I006466	4/24/1992	BCI CocaCola Bottling Company of LA	BCI Coca Cola Co of Los Angeles - Torrance Facility	19875 Pacific Gateway	Torrance	City of Los Angeles	90502	7351034057
408447	4 19I022875	10/14/2010	Praxair Surface Technologies	Praxair Surface Technologies	18502 Laurel Park Rd	Compton	Unincorporated	90220	7318019033
439465	4 19I024349	7/9/2013	Puratos Corporation	Puratos Corporation	18831 Laurel Park Road	Rancho Dominguez	Unincorporated	90220	7318019044
190488	4 19I013173	6/26/1997	Aerol Co	Aerol Co	19560 S Rancho Way	Rancho Dominguez	Unincorporated	90220	7318023014
351475	4 19I021776	10/15/2013	Sea Recovery Corp	Sea Recovery Corp	19610 S Rancho Way	Rancho Dominguez	Unincorporated	90220	7318023019
189322	4 19I004213	4/6/1992	Schimmicks Dismantling	Schimmick S Dismantling	22704 Normandie Ave	Torrance	Unincorporated	90502	7344018023
190158	4 19I011513	4/4/1995	Industrial Parts Depot	Industrial Parts Depot	23231 Normandie Ave	Torrance	Unincorporated	90501	7347018024
321913	4 19I020719	3/9/2007	CalPortland Co	Catalina Pacific Concrete Co	19030 S Normandie Ave	Torrance	Unincorporated	90502	7351030003
190255	4 19I012046	12/18/1995	Power Magnetics	Power Magnetics	711 W Knox St	Gardena	Unincorporated	90248	7351032034
419881	4 19I023318	9/7/2011	Redman Equipment & Manufacturing Co	Redman Equipment & Manufacturing Co	19800 Normandie Ave	Torrance	Unincorporated	90502	7351035018
296617	4 19I020093	2/23/2006	Crossfields Products	Crossfield Products Torrance Plant	19514 Normandie Avenue	Torrance	Unincorporated	90502	7351035020
190344	4 19I012498	8/15/1996	Metro Truck Body Inc	Metro Truck Body Inc	1201 Jon St	Torrance	Unincorporated	90502	7351036011
191241	4 19I016724	8/21/2001	Sonic Industries	Sonic Industries	20030 Normandie Ave	Torrance	Unincorporated	90502	7351036020

Table H.1: Summary of Industrial Facilities Covered Under the IGP in DC WMG

Application ID	WDID	Status Date	Owner/Operator Name	Site/Facility Name	Address	City	WMG City	Zip Code	APN
190238	4 19I011957	11/2/1995	Stewart Filmscreen Corp	Stewart Filmscreen Corp	1161 Sepulveda Blvd	Torrance	Unincorporated	90502	7407016045
293153	4 19I019621	6/30/2005	Maxima Ent Inc	Maxima Ent Inc	23920 Vermont Ave	Harbor City	Unincorporated	90710	7409019015
191350	4 19I017191	4/4/2002	Ultramar Inc Hanford	Ultramar Inc Wilmington Refine	2402 E Anaheim St	Wilmington	City of Los Angeles	90744	7440002032

1.San Pedro, Terminal Island, and Wilmington are locations in the City of Los Angeles. Listed separately for reference.

2. Although locations such as Gardena, Torrance, Long Beach, Lawndale, and Rancho Dominguez are not part of the DC WMG, the parcels listed here have postal addresses in those cities but are located within the DC WMG jurisdictions' boundaries.

Attachment I

90th Percentile Determination Statistics

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Copper Percentile Loads for Dominguez Channel Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (μg/l)**	**Copper Load (kg)**
12/25/2003	253.73	503.27	157.72	97.85
4/12/2010	237.2	470.48	167.36	97.07
9/22/2007	86.62	171.81	446.46	94.56
1/21/2012	**212.2**	**420.9**	**179.19**	**92.97**
1/18/2010	332.66	659.82	107.77	87.66
12/16/2002	362.08	718.17	92.83	82.18
2/11/2003	213.08	422.63	156.92	81.75
5/22/2006	149.49	296.5	220.73	80.68
11/26/2008	343.78	681.88	93.58	78.66
11/6/2011	99.65	197.65	308.68	75.21
2/27/2006	282.68	560.68	104.99	72.56

Copper Percentile Load Statistics for Dominguez Channel Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Copper Load (kg)**
Mean	463.98	85.56
Standard Error	56.35	2.69
Median	470.48	82.18
Standard Deviation	186.89	8.93
Sample Variance	34,929.49	79.71
Kurtosis	-1.00	-1.48
Skewness	-0.25	0.12
Range	546.36	25.29
Minimum	171.81	72.56
Maximum	718.17	97.85
95% Confidence Range for Mean	220.89	10.55

Lead Percentile Loads for Dominguez Channel Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Lead Load (kg)**
12/25/2003	253.73	503.27	41.65	25.84
4/12/2010	237.2	470.48	44.19	25.63
9/22/2007	86.62	171.81	117.21	24.82
1/21/2012	**212.2**	**420.9**	**47.32**	**24.55**
1/18/2010	332.66	659.82	28.47	23.16
2/11/2003	213.08	422.63	41.9	21.83
12/16/2002	362.08	718.17	24.59	21.77
5/22/2006	149.49	296.5	58.92	21.53
11/26/2008	343.78	681.88	24.77	20.82
11/6/2011	99.65	197.65	82.42	20.08
2/27/2006	282.68	560.68	27.66	19.11

Lead Percentile Load Statistics for Dominguez Channel Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Lead Load (kg)**
Mean	463.98	22.65
Standard Error	56.35	0.69
Median	470.48	21.83
Standard Deviation	186.89	2.30
Sample Variance	34,929.49	5.28
Kurtosis	-1.00	-1.33
Skewness	-0.25	0.06
Range	546.36	6.73
Minimum	171.81	19.11
Maximum	718.17	25.84
95% Confidence Range for Mean	220.89	2.72

Zinc Percentile Loads for Dominguez Channel Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (μg/l)**	**Zinc Load (kg)**
4/12/2010	237.20	470.48	716.77	415.72
9/22/2007	86.62	171.81	1910.75	404.70
1/21/2012	212.20	420.90	767.35	398.15
12/28/2004	1559.54	3093.31	100.01	381.37
1/18/2010	332.66	659.82	461.51	375.39
12/16/2002	**362.08**	**718.17**	**397.15**	**351.61**
2/11/2003	213.08	422.63	669.17	348.64
5/22/2006	149.49	296.50	941.96	344.30
11/26/2008	343.78	681.88	401.68	337.65
11/6/2011	99.65	197.65	1315.56	320.54
2/27/2006	282.68	560.68	450.53	311.40

Zinc Percentile Load Statistics for Dominguez Channel Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Zinc Load (kg)**
Mean	699.44	362.68
Standard Error	245.90	10.46
Median	470.48	351.61
Standard Deviation	815.55	34.69
Sample Variance	665,125.16	1,203.72
Kurtosis	9.52	-1.21
Skewness	3.00	0.12
Range	2,921.49	104.32
Minimum	171.81	311.40
Maximum	3,093.31	415.72
95% Confidence Range for Mean	963.92	41.01

Fecal Coliform Percentile Loads for Dominguez Channel Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (MPN/100mL)**	**Fecal Coliform Load (MPN)**
10/16/2004	50.49	100.14	1,630,351.54	2.01E+15
10/30/2010	**69.09**	**137.04**	**1,149,140.04**	**1.94E+15**
12/6/2010	51.04	101.24	1,129,834.20	1.41E+15
4/27/2005	36.41	72.21	1,526,996.91	1.36E+15

Fecal Coliform Percentile Load Statistics for Dominguez Channel Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Fecal Coliform Load (MPN)**
Mean	102.66	1.68E+15
Standard Error	13.28	1.72E+14
Median	100.69	1.68E+15
Standard Deviation	26.57	3.44E+14
Sample Variance	705.84	1.18E+29
Kurtosis	1.60	-5.68
Skewness	0.44	0.02
Range	64.83	6.53E+14
Minimum	72.21	1.36E+15
Maximum	137.04	2.01E+15
95% Confidence Range for Mean	52.07	6.74E+14

Copper Percentile Loads for Dominguez Channel Estuary Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Copper Load (kg)**
11/12/2003	117.00	232.07	132.45	37.89
10/13/2007	54.05	107.21	278.61	36.82
3/17/2012	49.56	98.31	303.12	36.74
4/12/2010	99.88	198.11	144.65	35.33
12/25/2003	100.43	199.21	143.37	35.21
2/27/2006	**111.35**	**220.86**	**128.92**	**35.10**
5/22/2006	72.22	143.25	187.33	33.08
12/28/2004	326.94	648.49	41.00	32.78
1/21/2012	66.56	132.02	195.06	31.75

Copper Percentile Load Statistics for Dominguez Channel Estuary Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Copper Load (kg)**
Mean	219.95	34.97
Standard Error	56.00	0.69
Median	198.11	35.21
Standard Deviation	168.01	2.06
Sample Variance	28,227.37	4.26
Kurtosis	6.93	-1.05
Skewness	2.52	-0.25
Range	550.18	6.15
Minimum	98.31	31.75
Maximum	648.49	37.89
95% Confidence Range for Mean	219.53	2.70

Lead Percentile Loads for Dominguez Channel Estuary Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Lead Load (kg)**
10/13/2007	54.05	107.21	64.42	8.51
3/17/2012	49.56	98.31	69.13	8.38
4/12/2010	99.88	198.11	33.05	8.07
2/27/2006	111.35	220.86	29.26	7.97
12/25/2003	100.43	199.21	32.14	7.89
5/22/2006	72.22	143.25	42.64	7.53
12/28/2004	326.94	648.49	9.35	7.47
1/21/2012	**66.56**	**132.02**	**44.41**	**7.23**
2/5/2009	71.71	142.23	39.98	7.01

Lead Percentile Load Statistics for Dominguez Channel Estuary Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Lead Load (kg)**
Mean	209.96	7.78
Standard Error	56.62	0.17
Median	143.25	7.89
Standard Deviation	169.86	0.51
Sample Variance	28,851.97	0.26
Kurtosis	7.44	-1.08
Skewness	2.65	-0.07
Range	550.18	1.50
Minimum	98.31	7.01
Maximum	648.49	8.51
95% Confidence Range for Mean	221.95	0.67

Zinc Percentile Loads for Dominguez Channel Estuary Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Zinc Load (kg)**
3/17/2012	49.56	98.31	1414.74	171.45
10/13/2007	54.05	107.21	1292.39	170.8
12/25/2003	100.43	199.21	673.97	165.51
4/12/2010	99.88	198.11	675.31	164.92
2/27/2006	**111.35**	**220.86**	**603.59**	**164.34**
5/22/2006	72.22	143.25	874.65	154.45
12/28/2004	326.94	648.49	191.28	152.91
1/21/2012	66.56	132.02	911.48	148.34
2/5/2009	71.71	142.23	824.4	144.54

Zinc Percentile Load Statistics for Dominguez Channel Estuary Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Zinc Load (kg)**
Mean	209.96	159.7
Standard Error	56.62	3.28
Median	143.25	164.34
Standard Deviation	169.86	9.85
Sample Variance	28,851.97	97.05
Kurtosis	7.44	-1.47
Skewness	2.65	-0.33
Range	550.18	26.91
Minimum	98.31	144.54
Maximum	648.49	171.45
95% Confidence Range for Mean	221.95	12.87

Fecal Coliform Percentile Loads for Dominguez Channel Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (MPN/100mL)**	**Fecal Coliform Load (MPN)**
12/6/2010	31.82	63.12	2,091,531.88	1.63E+15
10/30/2010	**25.52**	**50.62**	**1,986,091.77**	**1.24E+15**
10/25/2010	19.86	39.40	1,883,671.12	9.15E+14
2/27/2003	17.23	34.17	2,107,207.76	8.88E+14

Fecal Coliform Percentile Load Statistics for Dominguez Channel Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Fecal Coliform Load (MPN)**
Mean	46.83	1.17E+15
Standard Error	6.42	1.73E+14
Median	45.01	1.08E+15
Standard Deviation	12.85	3.46E+14
Sample Variance	165.07	1.20E+29
Kurtosis	-1.34	-0.68
Skewness	0.61	0.96
Range	28.95	7.40E+14
Minimum	34.17	8.88E+14
Maximum	63.12	1.63E+15
95% Confidence Range for Mean	25.18	6.78E+14

Copper Percentile Loads for Wilmington Drain Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Copper Load (kg)**
1/19/2010	93.98	186.40	74.43	17.10
11/30/2007	53.77	106.66	128.97	16.96
12/7/2009	**46.07**	**91.38**	**150.29**	**16.93**
10/14/2004	22.48	44.58	272.11	14.96
10/5/2011	15.23	30.21	391.63	14.59
12/12/2003	14.23	28.23	415.90	14.47
4/12/2010	30.64	60.77	183.61	13.76
2/18/2005	32.15	63.78	173.16	13.61

Copper Percentile Load Statistics for Wilmington Drain Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Copper Load (kg)**
Mean	76.50	15.30
Standard Error	18.47	0.52
Median	62.28	14.77
Standard Deviation	52.25	1.47
Sample Variance	2,729.76	2.17
Kurtosis	2.36	-2.01
Skewness	1.48	0.32
Range	158.17	3.49
Minimum	28.23	13.61
Maximum	186.40	17.10
95% Confidence Range for Mean	72.41	2.04

Lead Percentile Loads for Wilmington Drain Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Lead Load (kg)**
2/11/2003	194.83	386.44	9.17	4.37
12/27/2004	106.40	211.05	16.17	4.21
10/14/2004	22.48	44.58	72.69	4.00
10/5/2011	15.23	30.21	106.36	3.96
12/12/2003	14.23	28.23	111.05	3.86
4/12/2010	**30.64**	**60.77**	**49.44**	**3.70**
12/15/2002	73.72	146.22	19.61	3.54
12/17/2010	56.80	112.65	24.77	3.44

Lead Percentile Load Statistics for Wilmington Drain Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Lead Load (kg)**
Mean	127.52	3.88
Standard Error	43.35	0.11
Median	86.71	3.91
Standard Deviation	122.62	0.32
Sample Variance	15,035.41	0.10
Kurtosis	2.38	-0.87
Skewness	1.57	0.07
Range	358.21	0.93
Minimum	28.23	3.44
Maximum	386.44	4.37
95% Confidence Range for Mean	169.94	0.44

Zinc Percentile Loads for Wilmington Drain Watershed Storm Events				
Date	Flow (cfs)	Volume (ac-ft)	Concentration (µg/l)	Zinc Load (kg)
12/12/2003	14.23	28.23	1795.85	62.50
10/5/2011	15.23	30.21	1671.86	62.27
2/11/2003	194.83	386.44	127.38	60.68
4/12/2010	30.64	60.77	787.98	59.03
12/15/2002	73.72	146.22	312.39	56.31
12/17/2010	**56.80**	**112.65**	**395.76**	**54.96**
1/17/2010	32.47	64.40	659.75	52.37
11/20/2011	33.76	66.95	599.41	49.47

Zinc Percentile Load Statistics for Wilmington Drain Watershed Storm Events		
Statistical Analysis	Volume (ac-ft)	Zinc Load (kg)
Mean	127.52	3.88
Standard Error	43.35	0.11
Median	86.71	3.91
Standard Deviation	122.62	0.32
Sample Variance	15,035.41	0.10
Kurtosis	2.38	-0.87
Skewness	1.57	0.07
Range	358.21	0.93
Minimum	28.23	3.44
Maximum	386.44	4.37
95% Confidence Range for Mean	169.94	0.44

Fecal Coliform Percentile Loads for Wilmington Drain Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (MPN/100mL)**	**Fecal Coliform Load (MPN)**
1/6/2005	33.08	65.62	836,849.34	6.77E+14
10/14/2004	**22.48**	**44.58**	**1,061,970.28**	**5.84E+14**
4/21/2005	16.28	32.28	1,061,582.75	4.22E+14
3/20/2005	14.31	28.38	1,061,652.16	3.71E+14

Fecal Coliform Percentile Load Statistics for Wilmington Drain Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Fecal Coliform Load (MPN)**
Mean	42.72	5.14E+14
Standard Error	8.38	7.08E+13
Median	38.43	5.03E+14
Standard Deviation	16.76	1.42E+14
Sample Variance	280.74	2.00E+28
Kurtosis	0.42	-3.43
Skewness	1.12	0.25
Range	37.23	3.05E+14
Minimum	28.38	3.71E+14
Maximum	65.62	6.77E+14
95% Confidence Range for Mean	32.84	2.77E+14

Total Nitrogen Percentile Loads for Wilmington Drain Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (mg/l)**	**Total Nitrogen Load (kg)**
2/11/2003	194.83	386.44	2.53	1,204.68
12/27/2004	106.40	211.05	4.44	1,155.85
10/14/2004	22.48	44.58	19.85	1,090.73
12/12/2003	14.23	28.23	30.34	1,056.02
10/5/2011	15.23	30.21	27.70	1,031.86
4/12/2010	30.64	60.77	13.17	987.00
12/15/2002	**73.72**	**146.22**	**5.21**	**939.74**
12/17/2010	56.80	112.65	6.62	918.93

Total Nitrogen Percentile Load Statistics for Wilmington Drain Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Total Nitrogen Load (kg)**
Mean	127.52	1,048.10
Standard Error	43.35	35.46
Median	86.71	1,043.94
Standard Deviation	122.62	100.31
Sample Variance	15,035.41	10,061.55
Kurtosis	2.38	-0.94
Skewness	1.57	0.28
Range	358.21	285.75
Minimum	28.23	918.93
Maximum	386.44	1,204.68
95% Confidence Range for Mean	169.94	139.02

Total Phosphorus Percentile Loads for Wilmington Drain Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (mg/l)**	**Total Phosphorus Load (kg)**
11/30/2007	53.77	106.66	0.78	102.52
12/7/2009	46.07	91.38	0.91	102.38
10/14/2004	22.48	44.58	1.67	91.67
12/12/2003	14.23	28.23	2.54	88.57
10/5/2011	15.23	30.21	2.32	86.58
4/12/2010	**30.64**	**60.77**	**1.11**	**83.20**
12/15/2002	73.72	146.22	0.45	80.28
12/17/2010	56.80	112.65	0.56	78.15

Total Phosphorus Percentile Load Statistics for Wilmington Drain Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Total Phosphorus Load (kg)**
Mean	77.59	89.17
Standard Error	15.25	3.28
Median	76.08	87.58
Standard Deviation	43.14	9.28
Sample Variance	1,861.09	86.03
Kurtosis	-1.27	-0.98
Skewness	0.30	0.58
Range	117.99	24.37
Minimum	28.23	78.15
Maximum	146.22	102.52
95% Confidence Range for Mean	59.79	12.85

Copper Percentile Loads for Machado Lake Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Copper Load (kg)**
10/17/2004	59.30	117.61	66.98	9.71
1/9/2005	83.35	165.31	47.12	9.60
2/19/2007	17.43	34.57	225.28	9.60
10/17/2005	7.80	15.47	486.19	9.27
2/18/2005	**24.79**	**49.17**	**152.40**	**9.24**
12/10/2006	7.18	14.24	519.90	9.12
9/22/2007	7.46	14.79	469.98	8.57
12/15/2002	45.92	91.09	75.08	8.43
5/20/2006	8.21	16.28	409.83	8.22
4/12/2010	20.85	41.35	161.04	8.21
10/14/2004	11.93	23.66	262.51	7.66
12/12/2003	7.35	14.58	406.69	7.31
11/2/2008	3.41	6.77	860.53	7.18

Copper Percentile Load Statistics for Machado Lake Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Copper Load (kg)**
Mean	46.53	8.63
Standard Error	13.49	0.24
Median	23.66	8.57
Standard Deviation	48.63	0.88
Sample Variance	2,364.95	0.77
Kurtosis	1.90	-1.18
Skewness	1.62	-0.37
Range	158.54	2.53
Minimum	6.77	7.18
Maximum	165.31	9.71
95% Confidence Range for Mean	52.87	0.95

Lead Percentile Loads for Machado Lake Watershed Storm Events				
Date	Flow (cfs)	Volume (ac-ft)	Concentration (µg/l)	Lead Load (kg)
2/8/2010	68.01	134.89	12.94	2.15
5/20/2006	8.21	16.28	107.06	2.15
3/20/2011	108.72	215.63	8.00	2.13
4/12/2010	20.85	41.35	41.60	2.12
9/22/2007	7.46	14.79	116.11	2.12
11/2/2008	3.41	6.77	237.73	1.98
10/14/2004	**11.93**	**23.66**	**64.71**	**1.89**
12/25/2003	10.35	20.52	73.61	1.86
12/12/2003	7.35	14.58	100.16	1.80
2/27/2006	72.57	143.94	9.97	1.77
12/31/2005	35.16	69.74	19.70	1.69
2/5/2009	14.50	28.77	44.29	1.57
1/20/2010	77.12	152.96	8.30	1.57

Lead Percentile Load Statistics for Machado Lake Watershed Storm Events		
Statistical Analysis	Volume (ac-ft)	Lead Load (kg)
Mean	67.99	1.91
Standard Error	19.25	0.06
Median	28.77	1.89
Standard Deviation	69.42	0.22
Sample Variance	4,819.74	0.05
Kurtosis	-0.19	-1.33
Skewness	1.07	-0.32
Range	208.86	0.59
Minimum	6.77	1.57
Maximum	215.63	2.15
95% Confidence Range for Mean	75.48	0.24

Zinc Percentile Loads for Machado Lake Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Zinc Load (kg)**
10/17/2004	59.30	117.61	243.73	35.34
10/14/2004	11.93	23.66	1156.74	33.74
12/12/2003	7.35	14.58	1792.56	32.23
3/15/2003	111.01	220.18	116.94	31.74
2/27/2006	72.57	143.94	173.41	30.77
12/31/2005	**35.16**	**69.74**	**352.80**	**30.33**
3/20/2011	108.72	215.63	114.09	30.33
11/2/2008	3.41	6.77	3632.30	30.32
2/17/2005	53.45	106.02	221.66	28.97
12/25/2003	10.35	20.52	1124.71	28.45
2/5/2009	14.50	28.77	766.20	27.17
4/20/2007	6.87	13.63	1608.79	27.04
12/12/2011	45.71	90.66	229.08	25.60

Zinc Percentile Load Statistics for Machado Lake Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Zinc Load (kg)**
Mean	82.44	30.16
Standard Error	20.84	0.76
Median	69.74	30.33
Standard Deviation	75.14	2.75
Sample Variance	56,45.88	7.55
Kurtosis	-0.46	-0.24
Skewness	0.84	0.19
Range	213.41	9.74
Minimum	6.77	25.60
Maximum	220.18	35.34
95% Confidence Range for Mean	81.69	2.99

Fecal Coliform Percentile Loads for Machado Lake Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (MPN/100mL)**	**Fecal Coliform Load (MPN)**
2/28/2011	13.74	27.26	905,009.24	3.04E+14
2/21/2011	**12.23**	**24.26**	**901,607.98**	**2.70E+14**
4/21/2005	8.50	16.86	1,211,501.63	2.52E+14
3/20/2005	8.77	17.40	1,157,856.24	2.48E+14

Fecal Coliform Percentile Load Statistics for Machado Lake Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Fecal Coliform Load (MPN)**
Mean	21.44	2.68E+14
Standard Error	2.57	1.28E+13
Median	20.83	2.61E+14
Standard Deviation	5.14	2.55E+13
Sample Variance	26.39	6.52E+26
Kurtosis	-4.32	1.06
Skewness	0.28	1.30
Range	10.41	5.58E+13
Minimum	16.86	2.48E+14
Maximum	27.26	3.04E+14
95% Confidence Range for Mean	10.07	5.01E+13

Total Nitrogen Percentile Loads for Machado Lake Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (mg/l)**	**Total Nitrogen Load (kg)**
4/12/2010	20.85	41.35	12.28	625.76
10/14/2004	11.93	23.66	21.45	625.56
5/20/2006	8.21	16.28	30.63	614.65
3/20/2011	108.72	215.63	2.29	609.73
2/8/2010	68.01	134.89	3.62	602.62
12/12/2003	7.35	14.58	33.25	597.88
10/17/2004	**59.30**	**117.61**	**4.09**	**592.50**
12/31/2005	35.16	69.74	6.56	563.84
2/27/2006	72.57	143.94	3.15	558.53
4/20/2007	6.87	13.63	29.87	501.99
2/5/2009	14.50	28.77	13.88	492.06
11/2/2008	3.41	6.77	58.49	488.21
12/25/2003	10.35	20.52	18.09	457.74

Total Nitrogen Percentile Load Statistics for Machado Lake Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Total Nitrogen Load (kg)**
Mean	65.18	563.93
Standard Error	18.45	16.37
Median	28.77	592.50
Standard Deviation	66.52	59.02
Sample Variance	4,425.07	3,483.27
Kurtosis	0.45	-1.13
Skewness	1.19	-0.68
Range	208.86	168.03
Minimum	6.77	457.74
Maximum	215.63	625.76
95% Confidence Range for Mean	72.32	64.17

Total Phosphorus Percentile Loads for Machado Lake Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (mg/l)**	**Total Phosphorus Load (kg)**
10/17/2005	7.80	15.47	2.90	55.32
1/19/2010	65.26	129.44	0.34	55.02
10/17/2004	59.30	117.61	0.38	54.49
12/15/2002	45.92	91.09	0.48	54.29
12/10/2006	7.18	14.24	3.08	54.05
4/12/2010	**20.85**	**41.35**	**1.04**	**52.78**
10/14/2004	11.93	23.66	1.80	52.56
5/20/2006	8.21	16.28	2.57	51.56
12/12/2003	7.35	14.58	2.79	50.14
2/27/2006	72.57	143.94	0.27	48.41
12/31/2005	35.16	69.74	0.56	47.96
12/28/2004	65.59	130.10	0.29	45.81
1/9/2005	83.35	165.31	0.22	44.21

Total Phosphorus Percentile Load Statistics for Machado Lake Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Total Phosphorus Load (kg)**
Mean	74.83	51.28
Standard Error	15.83	1.02
Median	69.74	52.56
Standard Deviation	57.09	3.67
Sample Variance	3,259.34	13.49
Kurtosis	-1.72	-0.67
Skewness	0.24	-0.74
Range	151.08	11.11
Minimum	14.24	44.21
Maximum	165.31	55.32
95% Confidence Range for Mean	62.07	3.99

Copper Percentile Loads for Harbor Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Copper Load (kg)**
12/12/2011	404.05	801.42	68.83	68.00
5/20/2006	120.28	238.57	228.19	67.11
12/31/2005	566.58	1,123.79	47.65	66.01
2/5/2009	148.97	295.48	179.61	65.42
4/12/2010	141.87	281.39	187.10	64.90
3/25/2012	**297.39**	**589.85**	**89.23**	**64.88**
12/15/2002	476.17	944.48	54.30	63.22
11/20/2011	171.78	340.72	146.82	61.67
10/17/2005	75.96	150.67	325.35	60.43
2/19/2007	175.05	347.21	137.27	58.76
2/24/2008	1,076.71	2,135.62	20.67	54.42
2/18/2011	115.47	229.04	186.88	52.76
12/23/2003	260.45	516.60	75.28	47.94
3/20/2011	628.05	1,245.72	30.10	46.23
1/18/2010	484.40	960.80	38.68	45.82
1/23/2012	152.28	302.05	122.12	45.47

Copper Percentile Load Statistics for Harbor Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Copper Load (kg)**
Mean	656.46	58.32
Standard Error	131.96	2.07
Median	431.91	61.05
Standard Deviation	527.84	8.28
Sample Variance	278,612.10	68.55
Kurtosis	2.93	-1.35
Skewness	1.61	-0.54
Range	1,984.95	22.53
Minimum	150.67	45.47
Maximum	2,135.62	68.00
95% Confidence Range for Mean	517.28	8.11

Lead Percentile Loads for Harbor Watershed Storm Events				
Date	Flow (cfs)	Volume (ac-ft)	Concentration (µg/l)	Lead Load (kg)
12/31/2005	566.58	1,123.79	9.53	13.20
3/25/2012	297.39	589.85	18.15	13.20
2/5/2009	148.97	295.48	36.16	13.17
9/21/2007	142.91	283.46	37.44	13.08
4/12/2010	141.87	281.39	37.68	13.07
10/17/2005	**75.96**	**150.67**	**69.49**	**12.91**
12/15/2002	476.17	944.48	11.07	12.89
11/20/2011	171.78	340.72	30.22	12.69
2/19/2007	175.05	347.21	28.54	12.22
2/18/2011	115.47	229.04	36.58	10.33
1/19/2010	797.43	1,581.68	4.84	9.45
12/23/2003	260.45	516.60	14.67	9.34
9/22/2007	164.20	325.69	22.86	9.18
5/18/2011	105.88	210.01	35.06	9.08
1/23/2012	152.28	302.05	24.20	9.01
1/18/2010	484.40	960.80	7.58	8.97

Lead Percentile Load Statistics for Harbor Watershed Storm Events		
Statistical Analysis	Volume (ac-ft)	Lead Load (kg)
Mean	530.18	11.36
Standard Error	102.00	0.47
Median	333.20	12.46
Standard Deviation	408.02	1.88
Sample Variance	166,476.47	3.54
Kurtosis	1.57	-2.04
Skewness	1.49	-0.30
Range	1,431.01	4.22
Minimum	150.67	8.97
Maximum	1,581.68	13.20
95% Confidence Range for Mean	399.85	1.84

Zinc Percentile Loads for Harbor Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (µg/l)**	**Zinc Load (kg)**
3/25/2012	297.39	589.85	441.07	320.72
12/15/2002	476.17	944.48	268.17	312.23
11/20/2011	171.78	340.72	721.76	303.15
10/17/2005	75.96	150.67	1577.85	293.07
2/19/2007	175.05	347.21	672.12	287.68
2/18/2011	115.47	229.04	938.95	265.11
12/23/2003	**260.45**	**516.60**	**378.91**	**241.31**
1/20/2010	1,176.45	2,333.45	81.12	233.36
1/18/2010	484.40	960.80	194.12	229.92
1/23/2012	152.28	302.05	610.3	227.24
5/18/2011	105.88	210.01	874.59	226.42
3/15/2003	1,143.71	2,268.52	79.31	221.78
12/1/2005	59.04	117.10	1442.49	208.23
3/28/2006	378.42	750.58	220.84	204.33
10/13/2007	177.21	351.49	460.84	199.68
3/20/2011	628.05	1245.72	128.7	197.64

Zinc Percentile Load Statistics for Harbor Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Zinc Load (kg)**
Mean	728.64	248.24
Standard Error	173.52	10.58
Median	434.05	231.64
Standard Deviation	694.07	42.33
Sample Variance	481,732.36	1,792.18
Kurtosis	1.79	-1.24
Skewness	1.60	0.53
Range	2,216.35	123.08
Minimum	117.10	197.64
Maximum	2,333.45	320.72
95% Confidence Range for Mean	680.19	41.49

Fecal Coliform Percentile Loads for Harbor Watershed Storm Events				
Date	**Flow (cfs)**	**Volume (ac-ft)**	**Concentration (MPN/100mL)**	**Fecal Coliform Load (MPN)**
3/21/2005	121.46	240.92	1,986,553.79	5.90E+15
2/16/2005	100.97	200.27	2,056,755.44	5.08E+15
12/7/2004	100.02	198.38	2,065,795.94	5.05E+15
1/6/2005	86.89	172.35	1,801,689.58	3.83E+15
12/31/2003	**69.00**	**136.85**	**2,133,114.02**	**3.60E+15**
11/19/2004	72.04	142.88	2,032,397.02	3.58E+15
4/27/2005	69.84	138.52	2,049,063.64	3.50E+15
10/14/2004	76.23	151.21	1,704,152.82	3.18E+15

Fecal Coliform Percentile Load Statistics for Harbor Watershed Storm Events		
Statistical Analysis	**Volume (ac-ft)**	**Fecal Coliform Load (MPN)**
Mean	172.67	4.21E+15
Standard Error	13.28	3.49E+14
Median	161.78	3.71E+15
Standard Deviation	37.57	9.86E+14
Sample Variance	1,411.20	9.73E+29
Kurtosis	-0.30	-0.96
Skewness	0.84	0.79
Range	104.07	2.72E+15
Minimum	136.85	3.18E+15
Maximum	240.92	5.90E+15
95% Confidence Range for Mean	52.06	1.37E+15

Attachment J

Hourly Flow Analysis

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Dominguez Channel Watershed – Hourly Analysis for Zinc				
Date	**Total Volume (cf)**	**Zinc Load (kg)**	**Volume Captured (%)**	**Load Captured (%)**
4/12/2010	470.48	415.72	93.00%	99.00%
9/22/2007	171.81	404.70	96.00%	99.00%
1/21/2012	420.90	398.15	91.00%	99.00%
12/28/2004	3,093.31	381.37	43.00%	78.00%
1/18/2010	659.82	375.39	86.00%	98.00%
12/16/2002	718.17	351.61	93.00%	99.00%
2/11/2003	422.63	348.64	87.00%	99.00%
5/22/2006	296.50	344.30	99.00%	99.00%
11/26/2008	681.88	337.65	86.00%	99.00%
11/6/2011	197.65	320.54	90.00%	99.00%
2/27/2006	560.68	311.40	90.00%	99.00%
Average:	**699.44**	**362.68**	**86.73%**	**97.00%**
		Use Reduction:	**90.00%**	

Dominguez Channel Estuary Watershed – Hourly Analysis for Zinc				
Date	**Total Volume (cf)**	**Zinc Load (kg)**	**Volume Captured (%)**	**Load Captured (%)**
3/17/2012	98.31	171.45	94.00%	99.00%
10/13/2007	107.21	170.80	99.00%	99.90%
12/25/2003	203.56	165.93	99.00%	99.00%
4/12/2010	198.11	164.92	87.00%	99.00%
2/27/2006	220.86	164.34	90.00%	99.00%
5/22/2006	143.25	154.45	91.00%	99.00%
12/28/2004	648.49	152.91	53.00%	97.00%
1/21/2012	132.02	148.34	97.00%	99.00%
2/5/2009	142.23	144.54	99.00%	99.90%
Average:	**210.45**	**159.74**	**89.89%**	**98.98%**
		Use Reduction:	**90.00%**	

Wilmington Drain Watershed – Hourly Analysis for Total Nitrogen				
Date	**Total Volume (cf)**	**Total Nitrogen Load (kg)**	**Volume Captured (%)**	**Load Captured (%)**
2/11/2003	386.44	1,204.68	60.00%	90.00%
12/27/2004	211.05	1,155.85	95.00%	99.00%
10/14/2004	44.58	1,090.73	50.00%	100.00%
12/12/2003	28.23	1,056.02	58.00%	99.00%
10/5/2011	30.21	1,031.86	86.00%	99.00%
4/12/2010	60.77	987.00	74.00%	100.00%
12/15/2002	146.22	939.74	92.00%	99.00%
12/17/2010	112.65	918.93	95.00%	99.00%
Average:	**127.52**	**1,048.10**	**76.25%**	**98.13%**
		Use Reduction:	**80.00%**	

Machado Lake Watershed – Hourly Analysis for Fecal Coliform				
Date	**Total Volume (cf)**	**Fecal Coliform Load (MPN)**	**Volume Captured (%)**	**Load Captured (%)**
2/28/2011	27.26	3.04E+14	100.00%	100.00%
2/21/2011	24.26	2.70E+14	100.00%	100.00%
4/21/2005	16.86	2.52E+14	60.00%	99.00%
3/20/2005	17.40	2.48E+14	96.00%	99.00%
Average:	**21.44**	**2.68E+14**	**89.00%**	**99.50%**
		Use Reduction:	**90.00%**	

Harbor Watershed – Hourly Analysis for Zinc				
Date	**Total Volume (cf)**	**Zinc Load (kg)**	**Volume Captured (%)**	**Load Captured (%)**
3/25/2012	589.85	320.72	71.00%	98.00%
12/15/2002	944.48	312.23	94.00%	99.00%
11/20/2011	340.73	303.15	96.00%	99.00%
10/17/2005	150.67	293.07	52.00%	98.00%
2/19/2007	347.21	287.68	51.00%	98.00%
2/18/2011	229.04	265.11	98.00%	99.00%
12/23/2003	516.59	241.31	42.00%	93.00%
1/20/2010	2,333.47	233.45	59.00%	92.00%
1/18/2010	960.80	229.92	50.00%	88.00%
1/23/2012	302.05	227.24	99.00%	99.90%
5/18/2011	210.01	226.42	98.00%	99.90%
3/15/2003	2,268.61	222.12	32.00%	64.00%
12/1/2005	117.10	208.23	99.00%	99.90%
3/28/2006	750.58	204.33	45.00%	95.00%
10/13/2007	351.49	199.68	99.00%	99.90%
3/20/2011	1,245.72	197.64	30.00%	85.00%
Average:	**728.65**	**248.27**	**69.69%**	**94.23%**
		Use Reduction:	**70.00%**	

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Attachment K

Comparison between 2001 and 2012 MS4 Permit MCM Requirements

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The table presented in this attachment compares the Minimum Control Measure (MCM) requirements per the 2001 MS4 Permit (Order No. 01-182) and the current 2012 MS4 Permit (Order No. R4-2012-0175), and corresponds with Section 3.2 of the Dominguez Channel Watershed Management Group (DC WMG) Enhanced Watershed Management Program (EWMP).

Table K.1: Comparison of 2001 MS4 Permit MCMs to 2012 MS4 Permit MCMs

Program	Activity	2012 MS4 Permit Part	2001 MS4 Permit Part
Public Information and Participation Program	Public Education Program - advisory committee meeting (once per year)		4.B
	"No Dumping" message on storm drain inlets (by 2/2/2004)		4.B.1.a
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	VI.D.5.c.i.(1)	4.B.1.b
	Outreach and Education	VI.D.5.d.i.(2)	4.B.1.c
	Make reporting info available to public	VI.D.5.d.i.(4)	4.B.1.b
	Public service announcements, advertising, and media relations	VI.D.5.d.i.(1)	4.B.1.c.(1).(iii)
	Public education materials - proper handling	VI.D.5.d.i.(2)	
	Public education materials - activity specific	VI.D.5.d.i.(3)	
	Educational activities and countywide events	VI.D.5.c.ii	4.B.1.c.(4)
	Quarterly public outreach strategy meetings (by 5/1/2002)		4.B.1.c.(1).(iii)
	Ensure 35 million impressions per year are made on the general public via print, local TV, radio, or other appropriate media		4.B.1.d.(6)
	Constituent-specific outreach information made available to public		4.B.1.d
	Business Assistance Program		4.B.2
	Educate and inform corporate managers about stormwater regulations		4.B.2.a
	Maintain storm water websites	VI.D.5.d.i.(4)	
	Provide education materials to schools (50 percent of all K-12 children every two years)		4.B.1.d.(7)
	Provide independent, parochial, and public schools within jurisdiction with K-12 educational materials	VI.D.5.d.i.(5)	
	LACFCD shall develop a strategy to measure the effectiveness of in-school education programs		4.B.1.d.(9)
	LACFCD shall develop a behavioral change assessment strategy (by 5/1/2002)		4.B.1.d.(10)
	Educate and involve ethnic communities and businesses	VI.D.5.a.i.(3)	4.B.1.d.(2)
Industrial/Commercial Facilities Program	Track critical sources – restaurants	VI.D.6.b.i.(1)	4.C.1.a.(1)
	Track critical sources - automotive service facilities	VI.D.6.b.i.(1)	4.C.1.a.(1)
	Track critical sources – RGOs	VI.D.6.b.i.(1)	4.C.1.a.(1)
	Track critical sources - nurseries and nursery centers	VI.D.6.b.i.(1)	
	Track critical sources – USEPA Phase I facilities	VI.D.6.b.i.(2)	4.C.1.a.(2)
	Track critical sources - other federally-mandated facilities [40 Code of Federal Regulations (CFR) 122.26(d)(2)(iv)(C)]	VI.D.6.b.i.(3)	4.C.1.a.(2)
	Track critical sources - other commercial/industrial facilities that Permittee determines may contribute substantial constituent load to MS4	VI.D.6.b.i.(4)	
	Facility information - name of facility	VI.D.6.b.ii.(1)	4.C.1.b
	Facility information - name of owner/operator	VI.D.6.b.ii.(2)	4.C.1.b
	Facility information - contact information of owner/operator	VI.D.6.b.ii.(2)	
	Facility information - address	VI.D.6.b.ii.(3)	4.C.1.b
	Facility information – North American Industry Classification System (NAICS) code	VI.D.6.b.ii.(4)	
	Facility information – Standard Industrial Classification (SIC) code	VI.D.6.b.ii.(5)	4.C.1.b
	Facility information - narrative description of the activities performed and/or principal products produced	VI.D.6.b.ii.(6)	4.C.1.b
	Facility information - status of exposure of materials to storm water	VI.D.6.b.ii.(7)	
	Facility information - name of receiving water	VI.D.6.b.ii.(8)	
	Facility information - ID whether tributary to 303(d) listed water and generates constituents for which water is impaired	VI.D.6.b.ii.(9)	
	Facility information - NPDES/general industrial permit status	VI.D.6.b.ii.(10)	4.C.1.b
	Facility information - No Exposure Certification status	VI.D.6.b.ii.(11)	
	Update inventory of critical sources annually	VI.D.6.b.iii	4.C.1.c
	Notify inventoried industrial/commercial sites on BMP requirement	VI.D.6.c.i	
	Business Assistance Program	VI.D.6.c.ii	
	Inspect critical commercial sources (restaurants, automotive service facilities, retail gasoline outlets and automotive dealerships)	VI.D.6.d.i	4.C.2.a
	Inspect critical industrial sources (phase 1 facilities and federally-mandated facilities)	VI.D.6.e	4.C.2.b
	Verify No Exposure Certifications of applicable facilities	VI.D.6.e.i.(3)	
	Verify Waste Discharge Identification (WDID) Number of applicable facilities	VI.D.6.e.ii.(1)	4.C.2.b
	Source control BMPs	VI.D.6.f	4.C.3
	Provisions for Significant Ecological Areas (SEAs) (Environmentally Sensitive Areas (ESAs))	VI.D.6.g	4.C.3.b
	Progressive enforcement of compliance with stormwater requirements	VI.D.6.h	4.C.3.c
	Interagency coordination		4.C.3.d

Table K.1: Comparison of 2001 MS4 Permit MCMs to 2012 MS4 Permit MCMs

Program	Activity	2012 MS4 Permit Part	2001 MS4 Permit Part
Planning and Land Development Program	Peak flow control (post-development stormwater runoff rates, velocities, and duration)	VI.D.7.c.i	4.D.1
	Hydromodification Control Plan	VI.D.7.c.iv	4.D.1
	SUSMP Ordinance		4.D.2
	LID Ordinance	VI.D.7.d.i	
	Volumetric treatment control (SWQDv) BMPs	VI.D.7.c.i	4.D.3.a
	Flow-based treatment control BMPs	VI.D.7.c.i.(3)	4.D.3.b
	Prioritize BMP selection based on retention/detention versus treatment	VI.D.7.a.i.(7)	
	Alternative compliance measures through groundwater replenishment	VI.D.7.c.ii	
	Alternative compliance measures through biofiltration on- or off-site	VI.D.7.c.iii	
	Require implementation of post-construction Planning Priority Projects as treatment controls to mitigate storm water pollution	VI.D.7.b.ii	4.D.4
	Require verification of maintenance provisions for BMPs	VI.D.7.d.i	4.D.8
	California Environmental Quality Act process update to include consideration of potential stormwater quality impacts	VI.D.7.d.i	4.D.11
	General Plan Update to include stormwater quality and quantity management considerations and policies		4.D.12
	Targeted employee training of development planning employees		4.D.13
	Bioretention and biofiltration systems	VI.D.7.c.iii.(1)	
	SUSMP guidance document		4.D.14
	Annual reporting of mitigation project descriptions	VI.D.7.c.vi	
	Implement post construction BMP maintenance inspections	VI.D.7.d.iv.(c)	
Development and Construction Program	Erosion control BMPs	VI.D.8.d	4.E.1.d
	Sediment control BMPs	VI.D.8.d	4.E.1.a
	For sites less than 1 acre, implement erosion and sediment control BMPs through the use of a erosion and sediment control ordinance	VI.D.8.d	
	Non-storm water containment on project site	VI.D.8.d	4.E.1.c
	Waste containment on project site	VI.D.8.d	4.E.1.c
	Require preparation of a Local SWPPP or Erosion and Sediment Control Plan/SWPPP for approval of permitted sites	VI.D.8.d	4.E.2
	Inspect construction sites equal to or greater than one acre		4.E.2.b
	Electronic tracking system (database and/or Geographic Information System)	VI.D.8.g	
	Required documents prior to issuance of building/grading permit	VI.D.8.h.ii.(1)	4.E.3.a
	Implement technical BMP standards	VI.D.8.i.i	
	Progressive enforcement	VI.D.8.k	4.E.4
	Permittee staff training	VI.D.8.l	4.E.5
Public Agency Activities Program	Sewage system, maintenance, overflow, and spill prevention plans		4.F.1
	Public construction activities management	VI.D.9.b	4.F.2
	Public facility inventory	VI.D.9.c	
	Inventory of existing development for retrofitting opportunities	VI.D.9.d	
	Public facility and activity management	VI.D.9.e	
	Vehicle maintenance, material storage facilities, corporation yard management	VI.D.9.f	4.F.3
	Landscape, park, and recreational facilities management	VI.D.9.g	4.F.4
	Storm drain operation and maintenance	VI.D.9.h	4.F.5
	Streets, roads, and parking facilities maintenance	VI.D.9.i	4.F.6
	Parking facilities management	VI.D.9.i	4.F.7
	Emergency procedures	VI.D.9.j	4.F.8
	Alternative treatment control BMPs feasibility study		4.F.10
	Municipal employee and contractor training	VI.D.9.k	
IC/ID Program	Implementation program	VI.D.10.a.i	4.G.1.a
	MS4 Tracking (mapping) of permitted connections and illicit connections and discharges		4.G.1.b
	Procedures for conducting source investigations for IC/IDs	VI.D.10.b	4.G.2.a
	Procedures for eliminating IC/IDs	VI.D.10.c	4.G.2.b
	Procedures for public reporting of ID	VI.D.10.d	
	IC/ID response plan	VI.D.10.e	4.G.1.a
	IC/IDs education and training for staff	VI.D.10.f	4.G.1.c

Attachment L

Summary of Existing MCMs Implemented by the DC WMG

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This attachment includes tables summarizing the existing Minimum Control Measures (MCMs) implemented by the Dominguez Channel Watershed Management Group (DC WMG), corresponding with Section 4.2 of the DC WMG Enhanced Watershed Management Program (EWMP).

Attachment L List of Tables

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

Table L.1: DC WMG Existing Minimum Control Measures Reported during Permit Year 2010-2011

Program Tasks and Milestones	2001 MS4 Permit Part	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County[1]
Conduct educational activities within jurisdiction and participate in county-wide events	4.B.1.c.4	Feb-02	I	I	I	I	I	I
Organize Public Outreach Strategy meetings quarterly	4.B.1.c.5	May-02	NA	NA	NA	NA	NA	I
Conduct Media Outreach to 35 million impressions per year	4.B.1.c.6	Annually	NA	NA	NA	NA	NA	I
Distribute SPP information to K-12 schools	4.B.1.c.7	-	I	NC	NA	I	I	I
Coordinate and provide contact information for public education activities	4.B.1.c.8	Apr-02	I	I	I	I	I	I
Strategy to measure effectiveness of in-school programs	4.B.c.9	May-02	NA	NA	NA	NA	NA	I
Behavioral change assessment strategy towards SPP	4.B.c.10	May-02	NA	NA	NA	NA	NA	I
Coordinate watershed-specific pollution prevention outreach programs	4.B.1.d	Feb-03	I	NA	I	NA	I	I
Corporate Outreach Program to target retail gas outlets and restaurant chains	4.B.2.a	Feb-03	I	NA	NA	NA	NA	I
Coordinate an SPP program for a Business Assistance Program	4.B.2.b	Optional	NA	I	NA	NA	I	I
Industrial/Commercial Facilities Control - Permit Requirements								
Maintain a list of industrial/commercial facilities to be inspected	4.C.1	Aug-02	I	I	I	I	I	I
Inspect/visit industrial/commercial facilities appropriately	4.C.2	Aug-04	I	I	I	I	I	I
Initiate progressive enforcement for facilities failing to implement BMP's	4.C.3	-	I	I	I	I	I	I
Inspect restaurants twice during Permit cycle	4.C.2	Aug-04	I	I	I	I	I	I
Development Planning - Permit Requirements								
Implement development planning program that requires SUSMP	4.D	Feb-02	I	I	I	I	I	I
Develop peak flow control criteria	4.D.1	Feb-05	NA	NA	NA	NA	I	I
Amend codes and ordinances to give legal effect to SUSMP changes in permit	4.D.2.a	Aug-02	I	I	I	I	I	I
Implement revised SUSMP	4.D.2.b	Sep-02	I	I	I	I	I	I
Submit an Environmentally Sensitive Areas (ESAs) Delineation map to RWQCB	4.D.2.d	Jun-02	I	I	I	I	I	I

Table L.1: DC WMG Existing Minimum Control Measures Reported during Permit Year 2010-2011

Program Tasks and Milestones	2001 MS4 Permit Part	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County[1]
Implement SUSMP requirements for industrial/commercial projects >1 acre	4.D.5	Mar-03	I	I	I	I	I	I
Update CEQA guidelines to include specific storm water related issues	4.D.11	Feb-02	I	I	I	I	I	I
Update General Plan to include specific storm water related issues	4.D.12	-	I	NA	NA	I	I	I
Train targeted employees in permit requirements for Development Planning	4.D.13	Varies	I	I	I	I	I	I
Develop and make SUSMP guidelines available to the developer	4.D.14.a	Feb-02	I	I	I	I	I	I
Develop a technical manual for the siting and design of BMPs	4.D.14.b	Feb-04	I	NA	NA	NA	I	I
Development Construction - Permit Requirements								
Implement a development construction program	4.E.1 &2	Feb-02	I	I	I	I	I	I
Require proof of a Waste Discharger ID (WDID) number prior to filing Notice of Intent (NOI)	4.E.2.c	Mar-03	I	I	I	I	I	I
Require proof of an NOI and a copy of SWPPP for a transfer of ownership	4.E.3	Feb-02	I	I	I	I	I	I
Track the number of issued building and grading permits	4.E.3.c	Feb-02	I	I	I	I	I	I
Refer General Construction Activities Stormwater Permit (GCASP) violations to RWQCB	4.E.4	Feb-02	I	I	I	I	I	I
Train targeted employees in permit requirements for Development Construction	4.E.5	Varies	I	I	I	I	I	I
Public Agency Activities - Permit Requirements								
Implement a sewer overflow prevention and response program	4.F.1	Aug-02	I	I	I	I	I	I
Implement Development Planning Program at Permittee-owned construction projects	4.F.2.a	Aug-02	I	I	I	I	I	I
Implement Development Construction Program at Permittee-owned construction projects	4.F.2.b	Feb-02	I	I	I	I	I	I
Develop, if needed, and implement SWPPPs for field facilities	4.F.3	Feb-02	I	I	I	I	I	I
Equip wash areas with a clarifier, pre-treatment device, or be connected to sewer	4.F.3.c	Feb-02	I	I	I	I	I	I
Store pesticides/herbicides/fertilizers indoors and apply only in accordance	4.F.4.c&g	Feb-02	I	I	I	I	I	I
Designate Catch Basins as priority A, B, or C	4.F.5.a	Feb-02	I	I	I	I	I	I

Table L.1: DC WMG Existing Minimum Control Measures Reported during Permit Year 2010-2011

Program Tasks and Milestones	2001 MS4 Permit Part	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County[1]
Ensure that Catch Basins (CBs) are cleaned appropriately	4.F.5.c.1	Feb-02	I	I	I	I	I	I
Place temporary screens on CBs prior to special events or cleanout immediately afterwards	4.F.5.c.2	Feb-02	I	I	I	I	I	I
Place and maintain trash receptacles at all transit stops with shelters	4.F.5.c.3	Feb-02	I	I	I	I	I	I
Inspect the legibility of CB stencils and re-label within 180 days if necessary	4.F.5.d	-	I	I	I	I	I	I
Visually monitor and clean all open channels annually for debris	4.F.5.e.1	Feb-02	NA	I	I	I	I	I
Designate curbed streets as priority A, B, or C based on liter accumulation	4.F.6.a.b	Feb-02	I	I	I	I	I	I
Recover saw cutting waste and dispose it offsite	4.F.6.c	Feb-02	I	I	I	I	I	I
Train targeted employees in permit requirements for Public Agency Activities	4.F.6.d	Varies	I	I	I	I	I	I
Inspect and, if needed, clean Permittee owned parking lots twice per month, but at least once	4.F.7	Feb-02	I	I	I	I	I	I
Conduct a dry weather diversion study and create a priority list of drains for diversion	4.F.10	Jul-03	I	NA	NA	NA	I	I
Illicit Connections / Illicit Discharges - Permit Requirements								
Develop an Implementation Program which specifies how revisions of the IC/ID SQMP are implemented	4.G.1.a	-	I	I	I	I	D	I
Create a database for permitted storm drain connections and map IC/ID	4.G.1.b	Feb-03	NA	I	I	I	I	I
Perform IC/ID Trend Analysis	4.G.1.b	Feb-03	NA	NA	NA	NA	NA	I
Train targeted employees in the permit requirements for IC/ID	4.G.1.c	Varies	I	I	I	I	I	I
Field screen the storm drain system for illicit connections in open channels	4.G.2.a	Feb-03	NA	I	I	I	I	I
Field screen the storm drain system for illicit connections in underground storm drains in priority areas	4.G.2.a	Feb-05	I	I	I	I	I	I
Field screen the storm drain system for illicit connections in underground s/d larger than 36 inch diameter	4.G.2.a	Dec-06	I	I	I	I	I	I
Review all permitted connections to the storm drain system for compliance	4.G.2.a	Dec-06	NA	NA	NA	I	I	I
Investigate illicit connections 21 days after discovery	4.G.2.b	-	I	I	I	I	I	I
Terminate illicit connections 180 days after confirmation	4.G.2.b	-	I	I	I	I	I	I

Table L.1: DC WMG Existing Minimum Control Measures Reported during Permit Year 2010-2011									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**El Segundo**	**Hawthorne**	**Inglewood**	**Lomita**	**Los Angeles**	**Los Angeles County[1]**
Respond to illicit discharges within one business day of discovery	4.G.3.a	-	I	I	I	I	I	I
Investigate illicit discharges as soon as practicable	4.G.3.a	-	I	I	I	I	I	I

[1] Data is a combination of Los Angeles County and Los Angeles County Flood Control District
NA - Not Applicable or Completed
D - Developed
I - Program Implemented/Completed

Table L.2: DC WMG Existing Minimum Control Measures Reported during Permit Year 2011-2012

Program Tasks and Milestones	2001 MS4 Permit Section	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County	LACFCD
General Permit Requirements									
Prohibit non-stormwater discharges into the MS4 and watercourses	1	Feb-02	I	I	I	I	I	I	I
Comply with Receiving Water Limitations (RWL) requirements	2	Feb-02	I	I	I	I	I	I	I
Implement the Stormwater Quality Management Plan (SQMP)	3.A.1	Feb-02	I	I	I	I	I	I	I
Revise the SQMP	3.A.4	Aug-02	NA	I	NA	I	NA	I	I
Implement the most effective combination of BMPs for storm water/ urban runoff pollution	3.B	Feb-02	I	I	I	I	I	I	I
Prepare and submit Annual Budget Summary as part of the annual report to the RWQCB	3.E.5	Oct-02	I	I	I	I	I	I	I
Conduct quarterly watershed management committee meetings	3.F.3.g	Mar-02	NA	NA	I	I	I	I	I
Amend and adopt county ordinance to enforce all requirements of the permit, if needed	3.G.3	Nov-02	I	I	I	I	I	I	I
Submit to RWQCB a legal statement demonstrating the necessary legal authority	3.G.4	Dec-02	I	I	I	I	I	I	I
Prepare and submit to the RQWCB individual annual reports	1.B	Aug-02	I	I	I	I	I	I	I
Special Provisions									
Public Information and Participation - Permit Requirements									
Implement public information and participation program	4.B	Feb-02	I	I	I	I	I	I	I
Convene an Advisory Committee	4.B	ASAP	NA	NA	I	I	NA	I	I
Mark all storm drain inlets with a "no dumping" message	4.B.1.a	Feb-04	I	I	I	I	I	I	I
Maintain the (888) CLEAN-LA hotline	4.B.1.b	Feb-02	NA	NA	I	I	NA	I	I
Provide a list of reporting contacts to public through www.888CleanLA.com	4.B.1.b	Mar-02	I	NA	I	I	I	I	I
Media campaign for Storm Water Pollution Prevention (SPP)	4.B.1.c.1	Feb-02	NA	NA	I	I	NA	NA	I
Strategy to educate ethnic communities about SPP	4.B.1.c.2	Feb-03	NA	NA	I	NA	NA	NA	I
Enhance outreach for proper disposal of cigarette butts	4.B.1.c.3	Feb-02	NA	NA	I	I	NA	I	I

Table L.2: DC WMG Existing Minimum Control Measures Reported during Permit Year 2011-2012									
Program Tasks and Milestones	**2001 MS4 Permit Section**	**Due Date**	**El Segundo**	**Hawthorne**	**Inglewood**	**Lomita**	**Los Angeles**	**Los Angeles County**	**LACFCD**
Conduct educational activities within jurisdiction and participate in county-wide events	4.B.1.c.4	Feb-02	I	I	I	I	I	I	I
Organize Public Outreach Strategy meetings quarterly	4.B.1.c.5	May-02	NA	NA	NA	I	NA	NA	I
Conduct Media Outreach to 35 million impressions per year	4.B.1.c.6	Annually	NA	NA	NA	NA	NA	NA	I
Distribute SPP information to K-12 schools	4.B.1.c.7	-	I	NA	NA	I	I	NA	I
Coordinate and provide contact information for public education activities	4.B.1.c.8	Apr-02	I	I	I	I	I	I	I
Strategy to measure effectiveness of in-school programs	4.B.c.9	May-02	NA	NA	NA	I	NA	NA	I
Behavioral change assessment strategy towards SPP	4.B.c.10	May-02	NA	NA	NA	NA	NA	NA	I
Coordinate watershed-specific pollution prevention outreach programs	4.B.1.d	Feb-03	I	NA	NA	I	I	I	I
Corporate Outreach Program to target retail gas outlets and restaurant chains	4.B.2.a	Feb-03	I	NA	NA	NA	NA	NA	I
Coordinate an SPP program for a Business Assistance Program	4.B.2.b	Optional	NA	I	NA	NA	I	NA	NA
Industrial/Commercial Facilities Control - Permit Requirements									
Maintain a list of industrial/commercial facilities to be inspected	4.C.1	Aug-02	I	I	I	I	I	I	NA
Inspect/visit industrial/commercial facilities appropriately	4.C.2	Aug-04	I	I	I	I	I	I	NA
Initiate progressive enforcement for facilities failing to implement BMP's	4.C.3	-	I	I	I	I	I	I	NA
Inspect restaurants twice during Permit cycle	4.C.2	Aug-04	I	I	I	I	I	I	NA
Development Planning - Permit Requirements									
Implement development planning program that requires SUSMP	4.D	Feb-02	I	I	I	I	I	I	NA
Develop peak flow control criteria	4.D.1	Feb-05	NA	NA	I	I	I	I	NA
Amend codes and ordinances to give legal effect to SUSMP changes in permit	4.D.2.a	Aug-02	I	I	I	I	I	I	NA
Implement revised SUSMP	4.D.2.b	Sep-02	I	I	I	I	I	I	NA
Submit an Environmentally Sensitive Areas (ESAs) Delineation map to RWQCB	4.D.2.d	Jun-02	I	I	I	I	I	I	NA

Table L.2: DC WMG Existing Minimum Control Measures Reported during Permit Year 2011-2012

Program Tasks and Milestones	2001 MS4 Permit Section	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County	LACFCD
Implement SUSMP requirements for industrial/commercial projects >1 acre	4.D.5	Mar-03	I	I	I	I	I	I	NA
Update CEQA guidelines to include specific storm water related issues	4.D.11	Feb-02	I	I	I	I	I	I	NA
Update General Plan to include specific storm water related issues	4.D.12	-	I	NA	I	I	I	I	NA
Train targeted employees in permit requirements for Development Planning	4.D.13	Varies	I	I	I	I	I	I	NA
Develop and make SUSMP guidelines available to the developer	4.D.14.a	Feb-02	I	I	I	I	I	I	NA
Develop a technical manual for the siting and design of BMPs	4.D.14.b	Feb-04	I	NA	NA	I	I	I	NA
Development Construction - Permit Requirements									
Implement a development construction program	4.E.1 &2	Feb-02	I	I	I	I	I	I	NA
Require proof of a Waste Discharger ID (WDID) number prior to filing Notice of Intent (NOI)	4.E.2.c	Mar-03	I	I	I	I	I	I	NA
Require proof of an NOI and a copy of SWPPP for a transfer of ownership	4.E.3	Feb-02	I	I	I	I	I	I	NA
Track the number of issued building and grading permits	4.E.3.c	Feb-02	I	I	I	I	I	I	NA
Refer General Construction Activities Stormwater Permit (GCASP) violations to RWQCB	4.E.4	Feb-02	I	I	I	I	I	I	NA
Train targeted employees in permit requirements for Development Construction	4.E.5	Varies	I	I	I	I	I	I	NA
Public Agency Activities - Permit Requirements									
Implement a sewer overflow prevention and response program	4.F.1	Aug-02	I	I	I	I	I	I	NA
Implement Development Planning Program at Permittee-owned construction projects	4.F.2.a	Aug-02	I	I	I	I	I	I	NA
Implement Development Construction Program at Permittee-owned construction projects	4.F.2.b	Feb-02	I	I	I	I	I	I	I
Develop, if needed, and implement SWPPPs for field facilities	4.F.3	Feb-02	I	I	I	I	I	I	I
Equip wash areas with a clarifier, pre-treatment device, or be connected to sewer	4.F.3.c	Feb-02	I	I	I	I	I	I	I
Store pesticides/herbicides/fertilizers indoors and apply only in accordance	4.F.4.c&g	Feb-02	I	I	I	I	I	I	I
Designate Catch Basins as priority A, B, or C	4.F.5.a	Feb-02	I	I	I	I	I	I	I

Table L.2: DC WMG Existing Minimum Control Measures Reported during Permit Year 2011-2012

Program Tasks and Milestones	2001 MS4 Permit Section	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County	LACFCD
Ensure that Catch Basins (CBs) are cleaned appropriately	4.F.5.c.1	Feb-02	I	I	I	I	I	I	I
Place temporary screens on CBs prior to special events or cleanout immediately afterwards	4.F.5.c.2	Feb-02	I	I	I	I	I	I	I
Place and maintain trash receptacles at all transit stops with shelters	4.F.5.c.3	Feb-02	I	I	I	I	I	I	NA
Inspect the legibility of CB stencils and re-label within 180 days if necessary	4.F.5.d	-	I	I	I	I	I	I	I
Visually monitor and clean all open channels annually for debris	4.F.5.e.1	Feb-02	NA	I	I	I	I	I	I
Designate curbed streets as priority A, B, or C based on liter accumulation	4.F.6.a.b	Feb-02	I	I	I	I	I	I	NA
Recover saw cutting waste and dispose it offsite	4.F.6.c	Feb-02	I	I	I	I	I	I	I
Train targeted employees in permit requirements for Public Agency Activities	4.F.6.d	Varies	I	I	I	I	I	I	I
Inspect and, if needed, clean Permittee owned parking lots twice per month, but at least once	4.F.7	Feb-02	I	I	I	I	I	I	I
Conduct a dry weather diversion study and create a priority list of drains for diversion	4.F.10	Jul-03	I	NA	I	NA	I	NA	I
Illicit Connections/Illicit Discharges - Permit Requirements									
Develop an Implementation Program which specifies how revisions of the IC/ID SQMP are implemented	4.G.1.a	-	I	I	I	I	D	I	I
Create a database for permitted storm drain connections and map IC/ID	4.G.1.b	Feb-03	NA	I	I	I	I	I	I
Perform IC/ID Trend Analysis	4.G.1.b	Feb-03	NA	NA	I	NA	NA	I	I
Train targeted employees in the permit requirements for IC/ID	4.G.1.c	Varies	I	I	I	I	I	I	I
Field screen the storm drain system for illicit connections in open channels	4.G.2.a	Feb-03	NA	I	I	I	I	I	I
Field screen the storm drain system for illicit connections in underground storm drains in priority areas	4.G.2.a	Feb-05	I	I	I	I	I	I	I
Field screen the storm drain system for illicit connections in underground s/d larger than 36 inch diameter	4.G.2.a	Dec-06	I	I	I	I	I	I	I
Review all permitted connections to the storm drain system for compliance	4.G.2.a	Dec-06	NA	NA	I	I	I	I	I
Investigate illicit connections 21 days after discovery	4.G.2.b	-	I	I	I	I	I	I	I
Terminate illicit connections 180 days after confirmation	4.G.2.b	-	I	I	I	I	I	I	I

Table L.2: DC WMG Existing Minimum Control Measures Reported during Permit Year 2011-2012

Program Tasks and Milestones	2001 MS4 Permit Section	Due Date	El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	Los Angeles County	LACFCD
Respond to illicit discharges within one business day of discovery	4.G.3.a	-	I	I	I	I	I	I	I
Investigate illicit discharges as soon as practicable	4.G.3.a	-	I	I	I	I	I	I	I

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

Attachment M

MCM Evaluation

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TECHNICAL MEMORANDUM

To: Dominguez Channel Watershed Management Group (Alfredo Magallanes/City of Los Angeles; Bill Johnson/Los Angeles County; Doug Krauss/City of Hawthorne; Loren Amimoto/City of Inglewood; Lifan Xu/City of El Segundo; Andrew Jirik/Port of Los Angeles)

From: Team Dominguez (Richard Haimann/HDR, Stephanie Shamblin Gray/HDR)

Date: September 22, 2014

Subject: **MCM Evaluation Methodology – Addendum, Revised 9/22/2014**

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1. Background

In February 2014, HDR/SGA presented the City of Los Angeles Bureau of Sanitation (City) with the "MCM Evaluation Methodology" technical memorandum (memo). The memo (Attachment 1) presented research findings that may potentially be used to quantify pollutant load reductions as well as the uncertainties associated with those findings.

The memo demonstrated that strategies addressing polluting behaviors using various Minimum Control Measures (MCMs) may be anticipated to produce a wide range of pollutant load reduction. Factors influencing the results include the level of control the City has over the strategy, and the constructs that are affected by the outreach campaigns (guilt, social norm, etc.). The range of pollutant load reduction could be as low as around 2% for a minor pollutant that is a partial consequence of a strategy, to as high as 72% for a major pollutant that is entirely the consequence of a behavior that the City has significant control over (i.e. City staff behaviors).

It should be noted that these pollutant reductions were *per behavior* and no single behavior was expected to be responsible for all of the pollutants entering the watershed. Each of the corrections to behaviors and implementation of potential behaviors will only affect some fraction of the pollutant entering the watershed as there are typically numerous sources of a pollutant. That fraction was not evaluated. Additionally, the percent reduction would apply only to the location where the strategy was employed. Some strategies are geospatially broad (e.g. public education and outreach), while others are geographically constrained (e.g. keeping trash receptacles covered at municipal maintenance facilities). The geospatial contribution of pollutants and reductions in loads are not evaluated as part of this analysis.

2. Description of Previous Effort

The Enhanced Watershed Management Plan (EMWP) for the Dominguez Channel Watershed is a process of planning projects and control measures within the watershed and estimating the pollutant load reductions and resulting receiving water concentrations that would occur when those projects and control measures are implemented.

A number of the control measures anticipated are activities within Minimum Control Measure (MCM) categories. To estimate changes in runoff and receiving water quality based on expanding MCMs, a modeling effort, called a Reasonable Assurance Analysis (RAA), was proposed. The model requires some estimate of the pollutant load reduction that may occur on parcels where MCMs are effective within the watershed.

The MCMs reviewed in the previous memo (Attachment 1) require behavior change among people in order to be successfully implemented. Key to estimating pollutant load reductions from behaviors, then, is understanding what behaviors are being targeted, the likelihood of behavior change, and the impact of those behaviors on pollutant loads.

To develop the model, research of pro-environmental behavior and meta-analytic studies was conducted. This provided a model to consistently estimate the likelihood of behavior change from differing levels of MCM efforts. This model took into consideration the varying public education and outreach approaches and baseline characteristics of the population and allowed us to estimate that given a certain investment in public education and outreach efforts, some percent of the public will be likely to change behaviors that will result in reducing the loading of a given pollutant. For example, with certain investments in public education and outreach, the literature suggests that one can see approximately 18% of the population outreached changing to a lower pollutant behavior for certain pollutant types. The type of pollutant depends on the behavior change investment. For example, an investment in a campaign to educate, inform, and obtain behavior change associated with pet waste management would affect bacteria, but not necessarily sediment, metals, or pesticides. From the research conducted, the percent of people likely to adopt a less polluting behavior given a certain level of MCM investment can be estimated.

The next step was to estimate the expected reduction in a given pollutant when behavior changes to a lower polluting behavior. For each behavior type, we categorized the pollutants as *entirely*, *largely*, or *partially* the consequence of the polluting behavior the strategy addresses. This is based primarily on the amount of control a strategy has on behavior. The consequence of *entirely*, *largely*, and *partially* polluting behaviors is set at 100%, 66%, and 33%, respectively. Using the studies reviewed, it is reasonable to state that pollutant load reductions from different behavior changes can be categorized as high, medium, or low for those parcels or areas where the behavior change is expected to occur. No pollutant was considered to be removed 100% in any of the behaviors, so the highest value considered was 90%. Thus, reasonable values for high, medium, and low reduction are 90%, 60%, and 30%, respectively. For the distinct purpose of estimating percent pollutant load reduction in the EWMP planning effort, we determined that low pollutant load reduction would be between approximately 10 and 30 percent, medium pollutant load reduction would between 20 and 60 percent, and high pollutant load reduction would be between 30 and 90 percent.

Finally, we developed a potential range of pollutant load reductions from different behaviors across stormwater pollutant types. The 18% value is the most commonly observed impact of public education and outreach from a pure problem awareness campaign and represents the low range of reduction. An 80% value is the estimated effectiveness of pollution prevention and good housekeeping efforts mandated by municipalities and represents the high range of reduction. This gave us a model that is based on as much reputable data and research as is available to provide some basis for pollutant load reductions for classes of pollutants under different investments in MCMs.

3. Average Percent Removal

To streamline the modeling of pollutant load reduction, the City seeks to estimate a generalized average percent removal that can be used for all MCMs to be implemented and for all pollutants.

As described above, the February, 2014 memo presented the pollutant load reductions that may be anticipated from potential MCMs as a range of percent removals. The MCMs evaluated were based on the Center for Watershed Protection's (CWP's) most common residential and public behaviors that contribute pollutants to watersheds.

To determine an appropriate overall percent removal, a more select list of MCMs that may be expected to be implemented by the City was to be compiled. To that end, technical memorandum "Task 2.2 – Summary of Existing & Potential Control Measures" (March 2014) was used as a guide for future MCMs.

MCM categories that were found to have new activities to implement for the 2012 MS4 permit are as follows:

- Public Information and Participations Program
- Industrial/Commercial Facilities Program
- Planning and Land Development Program
- Development and Construction Program
- Illicit Connection and Illicit Discharge Detection and Elimination Program (IC/ID Program)
- Public Agency Activities Program

Specific MCMs in each of the categories were then compared to the memo's "Appendix A – List of Estimated Pollutant Behavior Impact Ranges" to estimate percent removal of pollutants for each constituent potentially attributable to the MCM. Any MCMs not previously evaluated were evaluated here using the same process. MCMs that were not specific to a behavior or activity associated with a set of pollutants (e.g., Public Education – Activity Specific) but had some type of related activity otherwise stated or implied in the document were evaluated as an activity associated with the non-specific MCMs (e.g., Public Education – Activity Specific: *Pet Waste Pick-Up*). The results of this effort are shown in the attached Table 1. The high-end range of the values represented the pollutant removal that may be anticipated from strategies with which the City has significant direct control (i.e. city staff are performing the behavior desired). The low-end range of the values would be anticipated with strategies associated with only public behavior change.

Each MCM was then evaluated to determine if it would be considered City controlled or public education. Although many activities in several other categories could be considered more heavily controlled, only the activities in the Public Agency Activities Program were considered to be under City control. This is a more conservative approach in that it would tend to under-estimate pollutant load reductions as a factor of safety. The average percent removal of all activities was then calculated for each constituent.

Table 2 presents an example showing two activities and the average percent removal of each constituent. For example, operations and maintenance of roads would be controlled by the City. The previous memo (Attachment 1) presented both the high and low range of percent removal that may be anticipated. Those values are shown in Table 2. Because this is a City controlled activity, the higher percent removal could be used and the value used to calculate the average percent pollutant removal is shown with a highlight in Table 2. An activity like pet waste pickup would rely more on public education and participation and the lower value could be used (shown highlighted). It should be noted that this value does not include any additional behavioral factors that certain messaging campaigns may create, such as guilt, that would increase the percent removal that may be anticipated.

Table 2. Range of Pollutant Load Reduction Effectiveness (%)

Pollutant Generating Activity	Sediment		Nutrients		Metals		Bacteria		Trash		Toxins	
Description	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
O&M for streets and roads.	10.7%	47.5%	3.6%	15.8%	7.1%	31.7%	0.0%	0.0%	7.1%	31.7%	3.6%	15.8%
Public Education - Pet Waste Pick Up	0.0%	0.0%	10.7%	47.5%	0.0%	0.0%	10.7%	47.5%	0.0%	0.0%	0.0%	0.0%
Average Percent	**23.8%**		**13.3%**		**15.8%**		**5.3%**		**15.8%**		**7.9%**	

4. Results

Using the values as described above (high value for city controlled activities, low value for public activities) for each constituent, the average removals for each of the constituents (sediment, nutrients, metals, bacteria, trash, and toxins) were calculated. The results are presented in Table 3 below.

Table 3. Average Pollutant Removal per Constituent

Description	%
Sediment	19.6%
Nutrients	11.7%
Metals	14.4%
Bacteria	6.5%
Trash	13.0%
Toxins	10.4%
Average of the Averages Above	**12.6%**

5. Conclusions

The overall average percent removal for all constituents and all activities is 12.6%. Because the lower public education value used does not consider any of the other constructs that are affected by the outreach campaigns (guilt, social norm, etc.), this overall percent removal may be lower than what will be observed. When considering the pollutant load removal of all activities, 10% may be conservatively and generally applied.

6. Assumptions and Limitations

The following assumptions and limitations should be taken into account when considering using the values presented.

- The percent removals are not based on specific geographic areas and may not apply equally to all geographic areas. For example, activities with a high degree of City control where they are performed by City employees, these may only apply to areas where City employees act, such as maintenance facilities or public buildings and may represent a fairly small portion of the entire pollutant load to a watershed of a particular pollutant. This geospatial variance is not taken into consideration in the averaging techniques employed.
- If only pollutant removals for activities with low degrees of City control – i.e. those that require public behavior change were to be included, the overall average percent removals would be lower. This assumes that the activities affecting public behavior change do not achieve all the constructs necessary to maximize behavior change (Intention, Moral Norm, Attitude, Perceived Behavioral Control, Guilt, Social Norm, Internal Attribution, Problem Awareness).
- If all the constructs necessary to maximize behavior change were successfully achieved throughout the population of the City, then the percent removals would potentially be higher than the average values presented herein.
- The percent reductions are based on a theoretical assessment of the potential reduction that could occur for a specific pollutant within a limited geography should a behavior actually change with respect to the release of that pollutant. Specific field studies are few that have measured changes in pollutant loads as correlated with behavior change.
- The data is more thorough for the measurement of behavior change through the use of survey instruments and observations of random samples through a population to correlate the constructs with changed behavior. The relationship between the behavior change and a measured concentration of a pollutant in runoff is more tenuous and the authors are relying on theoretical relationships between behavior associated with use of certain materials and pollutant releases during the uses of those materials.

Attachment 1 - MCM Evaluation Methodology

To: Richard Haimann/HDR.

From: Adam Quinn/SGA.

Reviewed by: Stephen Groner/SGA.

Date: 2/25/2014.

Subject: **MCM EVALUATION METHODOLOGY**

1. Executive Summary.

The Enhanced Watershed Management Plan for the Dominguez Channel Watershed is a process of planning projects and control measures within the watershed and estimating the pollutant load reductions and resulting receiving water concentrations that would occur when those projects and control measures are implemented.

A number of the control measures anticipated are activities within Minimum Control Measure (MCM) categories. MCMs include 1) public education and outreach, 2) public participation and involvement, 3) pollution prevention and good housekeeping, 4) illicit discharge detection and elimination, 5) construction site runoff control, and 6) post construction site runoff control.

To estimate changes in runoff and receiving water quality based on expanding these MCMs, a modeling effort, called a Reasonable Assurance Analysis (RAA), is proposed. The model requires some estimate of the pollutant load reduction that may occur on parcels where MCMs are effective within the watershed.

The purpose of this memorandum is to present estimates of pollutant load reductions that can reasonably be expected from expanding three of the above six MCMs. Those MCMs are: 1) public education and outreach, 2) public participation and involvement, and 3) pollution prevention and good housekeeping.

Each of the three MCMs reviewed in this memorandum require behavior change among people in order to be successfully implemented. Key to estimating pollutant load reductions from behaviors, then, is understanding what behaviors are being targeted, the likelihood of behavior change, and the impact of those behaviors on pollutant loads.

To develop the model, research of pro-environmental behavior and meta-analytic studies was conducted. This provided a model to consistently estimate the likelihood of behavior change from differing levels of MCM efforts. This model takes into consideration the varying public education and outreach approaches and baseline characteristics of the population.

The resulting model allows us to estimate that given a certain investment in public education and outreach efforts, some percent of the public will be likely to change behaviors that will result in reducing the loading of a given pollutant. For example, with certain investments in public education and outreach, the literature suggests that one can see approximately 18% of the population outreached changing to a lower pollutant behavior for certain pollutant types. The type of pollutant depends on the behavior change investment. For example, an investment in a campaign to educate, inform, and obtain behavior change associated with pet waste management would affect bacteria, but not necessarily sediment, metals, or pesticides. From the research conducted, the percent of people likely to adopt a less polluting behavior given a certain level of MCM investment can be estimated.

The next step is to estimate the expected reduction in a given pollutant when behavior changes to a lower polluting behavior. A review of watershed and stormwater research shows that researchers to date have generally not assigned pollutant loads to specific behaviors. A range of studies have substituted the reach of the program (e.g., number of residents outreached) or sample results (e.g., 78 known illegal discharges were eliminated) in place of a quantified measurement of pollution reduction.

Using the studies reviewed, it is reasonable to state that pollutant load reductions from different behavior changes can be categorized as high, medium, or low for those parcels or areas where the behavior change is expected to occur. For the distinct purpose of estimating percent pollutant load reduction in this EWMP planning effort, we estimated that low pollutant load reduction would be between 10 and 30 percent, medium pollutant load reduction would between 20 and 60 percent, and high pollutant load reduction would be between 30 and 90 percent, as summarized on Table 6.1. These ranges are the product of the high, medium, and low pollutant contribution ranges used in the literature and the categorization of behavior types conducted in Section 6 of this memorandum.

This gives us a model that is based on as much reputable data and research as is available to provide some basis for pollutant load reductions for classes of pollutants under different investments in MCMs. These can be distributed spatially through the model based on land use. For example nutrient load reductions due to improved fertilizer application would apply to the pervious surfaces of residential parcels more so than the pervious surfaces of industrial parcels.

Given this, a certain investment in a public education and outreach campaign may achieve 18% behavior change. This behavior change may result in 30% less nutrient discharges from affected parcels. A subcatchment may have 70% residential and recreational parcels with an average pervious surface of 50% of those parcels. The nutrient load reduction from that subcatchment that can be estimated from the investment in the public education and outreach campaign would be 0.18 x 0.30 x 0.70 x 0.50 = 0.019 = 1.9%.

This memo presents the findings of the literature researched and shows how we have constructed the model from that literature for estimating pollutant load reductions from increased investments in the three MCMs listed above. It also presents the percent reductions expected for different pollutant classes on affected parcels from different investments in the MCMs listed above.

2. Introduction.

The watershed management group (WMG) has a stated goal of quantifying the pollutant load reduction associated with various MCMs. This will be used to estimate pollutant load reductions anticipated from expansions or broadening of minimum control measures during implementation of enhanced watershed management plans.

Three minimum control measures are considered in this document:

- Public education and outreach;
- Public participation and involvement; and
- Pollution prevention and good housekeeping.

This document discusses an evaluation methodology for the above MCMs. Each MCM is discussed in turn with consideration to different concepts, the product of which provides an estimation of the impact of that MCM. The concepts are:

- The estimated measurement of behavior change;
- A list of pollution behaviors and the associated pollutants;
- An estimation of cost for a given mode of outreach; and
- An estimation of pollutant load reduction from changes in pollution behaviors.

3. Public education and outreach MCM.

Public education and outreach is a required MCM under NPDES permits with the stated goal of making "the public sufficiently aware and concerned about the significance of their behavior for stormwater pollution, through information and education, that they change improper behaviors." All WMG jurisdictional entities undertake a range of public education and outreach activities as delineated in the WMG jurisdictional entity MCM census.

a. Estimated measurement of behavior change.

There is a significant body of research including multi-decade meta-analyses of behavioral studies assessing the likelihood of an individual adopting pro-environmental behaviors based on different forms of outreach, education, and awareness. Meta-analyses are methods of research that combine results from a range of similar studies to identify patterns in the research. By aggregating an entire body of research, more robust findings and understanding can be asserted. These studies are peer reviewed and subsequent meta-analyses are compared horizontally to demonstrate relatively consistent reporting of results.

The end goal of each study in the meta-analysis was to measure the rate of behavior change caused by public education and outreach efforts. Conversely, the end result of the *meta-analysis* was to identify the extent to which different behavioral constructs contributed to that end behavior change. For example, if a similar amount of funds was spent to reach a similar population of people to change a similar behavior, but the results differed, the meta-analysis sought to identify what caused that difference. The difference might be that one outreach effort used pictures of children to guilt parents into adopting pro-environmental behavior while another outreach effort tried to make residents aware of the problem and the consequences of their behaviors on the environment. These differences were categorized into behavioral constructs and the relationships between the various constructs, ultimately culminating in behavior change, were measured.

The results of this research are summarized in Table 3.1, below, which shows relationships between various behavioral constructs (e.g., intention, moral norms, etc.) and their impact on behavior change.

The results are displayed in a matrix such that the relationship between any two behavioral constructs can be identified.

The numbers in the first column correlate to the numbers across the top of the table. Hence, reading across row "Behavior," we can see that [intention] to undertake a behavior explains 52% of the variance in actual behaviors taken. Similarly, adoption of a [moral norm] explains 15% of the variance in actual behaviors taken and so on until [problem awareness] (e.g., education) which explains 18% of the observed behavior change. Explanations of each behavioral construct follow.

Table 3.1

Standardized total effects of modes of outreach on end states.

Behavioral Construct	Behavior Change	Intention	Moral Norm	Attitude	PBC	Guilt	Social Norm	Attribution	Problem Awareness
Behavior Change	—	.52	.15	.15	.16	.11	.13	.10	.18
Intention		—	.29	.29	.31	.21	.26	.18	.35
Moral norm			—	—	—	.25	.26	.29	.65
Attitude				—	—	.27	.36	.25	.34
PBC					—	.19	.25	.08	.19
Guilt						—	.32	.22	.63
Social norm							—	.23	.40
Attribution								—	.43
Problem awareness									—

The behavioral constructs used and compared have the following definitions:

- **Behavior Change**. The actual adoption of the intended pro-environmental behavior.
- **Intention**. The intention to adopt a pro-environmental behavior.
- **Moral norm**. The belief that oneself has a moral obligation to adopt a pro-environmental behavior.
- **Attitude**. A positive attitude or disposition towards a pro-environmental behavior.
- **PBC**. Stands for "Perceived Behavioral Control." The belief that adopting a pro-environmental behavior is within your power and you have the tools to do so.
- **Guilt**. The feeling that one ought to adopt a pro-environmental behavior and failure to do so includes negative emotions.
- **Social norm**. The belief that everyone else has adopted a pro-environmental behavior and that to not adopt the same would set you apart.
- **Problem awareness**. Awareness that a behavior is a problem and understanding of the consequences of that problem.

A number of additional considerations should be noted in interpreting the model. Each set of considerations is discussed in turn.

i. Assumptions of the model.

The literature aggregates studies together to calculate a single total effects value. The total effects represent the sum of the direct and mediated indirect effects through which a predictor influences a dependent variable. That is, before a behavior can ever be changed, the resident must have an intention to change their behavior (see Figure 1). A public education or outreach effort using problem awareness in the abstract has an 18% effective rate of behavior change and a 35% effective rate of changing the intention of the resident. The impact of problem awareness on intention is included in the impact of problem awareness on behavior change. Problem awareness' impact on behavior change is a mediated indirect effect that must go through intention to reach behavior change.

A second assumption of the model is that the correlations observed between outreach efforts and behavior change will continue. The results of table 3.1 serve as a proxy for the effectiveness of a given public education or outreach effort. It is important to note that in the underlying model the values are only correlative and not necessarily causative. While we cannot be sure that increasing population awareness of an issue will *necessarily* cause an 18% change in population behavior, we can expect an 18% change in population behavior to correlate with an increase in awareness.

ii. Limitations of the model.

The aggregation of studies into a single meta-analysis results in an equivalence being made between different modes and scales of outreach. The result of a small, one-on-one outreach effort is aggregated along with the result of a countywide advertising campaign outreach effort. This aggregation provides a more accurate estimation of the average outreach effectiveness across the WMG. Because each WMG jurisdictional entity takes a range of outreach efforts across a range of methods (e.g., industry focused, one-on-one, mass media, etc.), an aggregated estimate is the most appropriate estimate.

This aggregation has a final benefit in accounting for MCM overlap. Research indicates that the effectiveness of a given MCM action is dependent on other MCM actions. For example, an MCM action to change a given behavior is more effective if the population has a higher base level of awareness of the issue. A prior MCM focused on public education would improve the effectiveness of a later MCM focused on behavior change. Because each of these MCMs may have occurred through a different method of outreach (e.g., industry focused, one-on-one, mass media, etc.), it is impossible to disambiguate the past outreach efforts from the results of the current outreach effort. Similarly, WMG jurisdictional entities also overlap. It is impossible to properly evaluate the efforts of City of Los Angeles without also considering the efforts of County of Los Angeles because their efforts target the same population. Aggregating all outreach at the population level obviates the need for these distinctions.

iii. Using the model to estimate compound or complex outreach efforts.

In estimating the impact of outreach programs with multiple components, the estimate effectiveness will fall between the baseline effectiveness (in all cases this is education) and the composite of the two modes. For example, an outreach effort that attempts to educate residents and promote the behavior as a social norm, such as LA County's solar map which shows how many residents have adopted solar solutions, would have an effectiveness somewhere between 18% and 29% (1 – (.82 x .85) = .286). This assumption rests on the premise that both modes of outreach are fully executed. That is, the outreach effort achieves the standard level of education and the standard level of promoting a social norm.

The relationships between potential outreach states are shown in Figure 1, below. All outreach conscribes to one or more of the states below as its primary objective. For example, the majority of outreach aims to educate the public (problem awareness) and then encourage one or more additional states (e.g. internal attribution / "Only you can prevent forest fires"; feelings of guilt / "Get involved now. Pollution hurts all of us."; etc.). The end goal of all public education and outreach is to the change behavior. Consequently, it is important to identify the strategy of the public education or outreach effort to properly estimate its likelihood of changing the end behavior.

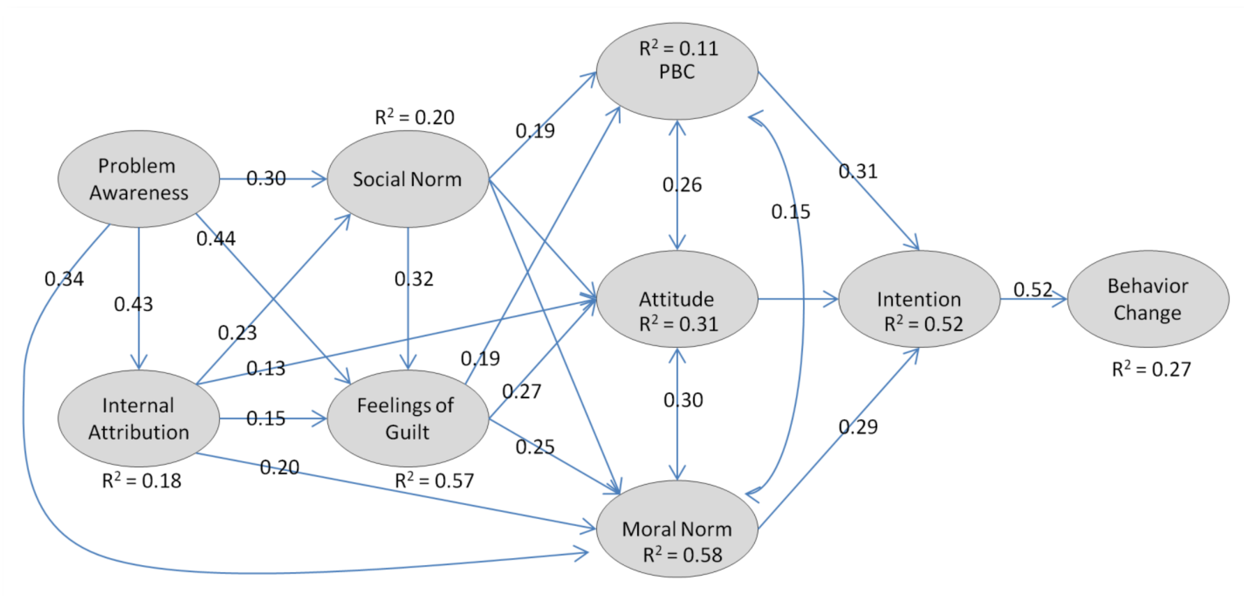

Figure 1. Results of Meta Analytic Structural Equation Modeling. PBC = perceived behavioral control. Single headed arrows = standardized path coefficients. Double headed arrows = correlations. R^2 = explained variance.

The modes of public education and outreach identified for WMG jurisdictional entities in the review of literature are included in Table 3.2, below.

Table3.2

Estimated public education or outreach effectiveness by mode.		
Outreach mode	Calculation	Standardized total effect
Education	1 – (1 – .18)	.18
Education and Guilt	1 – ((1 – .18) x (1 – .11))	.18 to .27
Education and Social Norm	1 – ((1 – .18) x (1 – .13))	.18 to .29
Education and Attitude	1 – ((1 – .18) x (1 – .15))	.18 to .30

Estimated public education or outreach effectiveness by mode.		
Outreach mode	Calculation	Standardized total effect
Education and PBC	1 – ((1 – .18) x (1 – .16))	.18 to .31
Education and Intention	1 – ((1 – .18) x (1 – .52))	.18 to .82

In determining where in the provided range a particular outreach effort will align, consideration should be given to the effectiveness of similarly situated efforts on the same target population and the quality and focus of the work plan. A campaign targeted at educating the public and making them feel guilt has less complexity than a campaign targeted at educating the public and persuading them to act (i.e., intention) through an oil filter exchange. The later requires more one-on-one interaction, more resources, and more logistical planning. It should also be noted that achieving the higher standardized total effects becomes increasingly challenging. Although it is possible for an effectively run problem awareness and intention campaign to result in a substantial rate of behavior change (e.g., a hypothetical program that paid $100 for every gallon of used oil recycled would likely approach 100% behavior change), observed standardized total effects tend toward the lower end of the spectrum.

A final consideration in determining where in the provided range a particular outreach effort will align is existing characteristics of the target population. As discussed, research has shown the public education and outreach efforts are often intertwined such that earlier outreach efforts improve the likelihood of subsequent efforts. For example, there is a critical mass phenomenon where people are more likely to adopt behavior changes when the pre-campaign adoption rate reaches roughly 20% of the general population. Efforts at behavior change with lower overall awareness levels will be less successful. These characteristics can be derived from baseline surveys that often precede any outreach effort so that end-of-campaign surveys can accurately reflect the net change achieved.

b. Identification of polluting behavior and pollutant.

Public education and outreach efforts require a specific behavior to be identified with the goal of changing that behavior. Different behaviors are associated with different pollutants and many behaviors might be associated with more than one pollutant. For example, improper or over fertilization introduces both unnecessary nutrients to the water supply and toxins. Overwatering causes excess sediment, nutrients, metals, trash, and toxins to all flow into the stormwater system, albeit with each pollutant being a smaller overall load than the pollutants from improper fertilization. To that end, it is important to identify the behavior and pollutant profile before estimating the potential pollutant load reduced by successful public education or outreach efforts.

The Center for Watershed Protection (CWP) lists the most common residential and public behaviors that contribute pollutants to watersheds. This list includes the relative proportion of pollutants that are introduced to the watershed by each of these behaviors as estimated by the CWP. This list has been supplemented by activities expressly targeted by WMG jurisdictional entities in existing public education and outreach programs as identified during the census of existing MCM programs. The estimated levels of pollution linked to each behavior were extrapolated from nearest equivalent as established by the CWP.

By identifying the residential polluting behavior a public education or outreach effort will target, an estimation of the total pollutant load of that behavior can be derived.

Table 3.3

Comparison of pollutant contribution from various residential behaviors.							
Residential Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Improper fertilization	X	●	X	X	X	○	
Excess pesticide use	X	X	X	X	X	●	
Over-watering	○	⦿	○	X	○	⦿	
Extensive turf cover	○	⦿	X	X	X	⦿	
Tree clearing	⦿	⦿	X	X	X	X	
Yard waste dumping	⦿	●	X	○	○	X	
Soil compaction	⦿	⦿	○	○	X	X	
Soil erosion	●	⦿	○	○	X	X	
Failing septic systems	○	●	X	●	X	○	
Pool discharges	X	X	X	X	X	●	
Car wash water flows	⦿	●	⦿	X	X	⦿	Oil
Hosing/Leaf-blowing	●	⦿	⦿	X	⦿	○	Oil
HHW dumping	X	○	●	X	X	●	Oil
Car fluid spills/dumping	X	X	⦿	X	X	●	Oil
Used oil spills/dumping	X	X	⦿	X	X	●	Oil
Connected downspouts	⦿	●	●	⦿	X	○	Oil
Added IC and bare soil	●	○	⦿	X	⦿	○	Oil
Pet waste wash off	X	●	X	●	X	X	
Poor STP maintenance	●	●	●	⦿	●	○	Oil
Buffer encroachment	○	○	○	○	○	X	
Storm drain dumping	⦿	○	⦿	⦿	●	●	Oil
Hobby farm run off	⦿	●	○	⦿	○	X	
Horse / stable run off	X	●	X	●	X	X	
Recreation vehicle waste	X	●	X	●	●	⦿	Oil
Illegal dumping	○	○	○	X	●	●	Oil
Prescription drugs drain	X	X	X	⦿	X	●	

Comparison of pollutant contribution from various residential behaviors.							
Residential Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Recreational boat waste	⊙	X	X	⊙	X	⊙	Oil
Failure to recycle	X	X	●	X	●	X	
○ = minor pollutant contribution ● = major pollutant contribution ⊙ = moderate pollutant contribution X = not a pollutant source							

c. Cost of public education and outreach efforts.

The final element in estimating the pollutant load reduction from public education and outreach efforts is to identify the average cost and the population reached by each mode of outreach. The Center for Watershed Protection provides general guidance on the issue as shown in table 3.4, below.

In interpreting the table, the following definitions are used:

- **Hit rate**. How effective the strategy is in reaching the target audience.
- **Adoption rate**. The proportion of the target audience will adopt the practice after learning about it.
- **Startup cost**. The cost to initially implement the strategy including outreach.
- **Ongoing cost**. The cost to maintain the strategy over several years.
- **Expertise**. The specialized knowledge or training needed to implement the strategy.

Table 3.4

Comparing different public education and outreach methodology costs and effectiveness.					
Public education or outreach methodology	Comparative Factors				
	Hit rate	Adoption rate	Startup cost	Ongoing cost	Expertise
Passive education	●	○	$$	$$	○
Active education	○	●	$	$$	●
Direct municipal service	●	⊙	$$$	$$$	○
Subsidies and discounts	⊙	⊙	$$	$$$	○
Recognition programs	○	●	$	$	⊙
Stewardship groups	○	●	$$	$$	⊙
Local ordinances	○	⊙	$$	$	⊙
Notifications/Signs	⊙	○	$$	$	○
Restrictions/Bans	●	●	$	$	⊙
Enforcement	○	●	$	$	⊙
Utility pricing	⊙	⊙	$$	$	⊙
○ / $: low; ⊙ / $$: medium; ● / $$$: high					

The hit rates reported generally agree with the hit rates SGA has experienced during past outreach. Similarly, the adoption rates generally agree with the estimated rates of behavior change calculated in section 3, part A, above. Those are, low rates of adoption for passive education and higher rates of adoption as more complex, and often more expensive, modes are introduced. In estimating hit rates, a low hit rate for a typical outreach effort will reach 1000 people, a medium hit rate will reach approximately 10,000, and a high hit rate will reach approximately 50,000.

The CWP also provides the following select price estimates:

Table 3.5

Unit cost for public education and outreach techniques.		
Technique	Unit	Estimated Cost
Overall residential outreach	Per 1000 capita	$140 – $1111
Outreach materials (magnets, stickers, etc)	Per 1000 capita	$170 – $3500
Advertising (billboards, movie theatre, ads)	Per month	$150 – $1850
Surveying	Per 1000 capita	$15,000
Municipal services (municipal composting, etc)	Per household	$1.85 – $2.40
Residential services (curbside pickup)	Per household	$11 – $29
Staffing (200 – 800 hours)	Per program	$10,000 – $100,000

The costs reported generally agree with the costs experienced by SGA during past outreach. The Southern California area tends towards the higher end of the spectrum in most categories and it should be noted that costs vary considerably across jurisdictions. The competition for billboards in the City of Los Angeles differs from county-wide Los Angeles which differs from penumbral cities. Although every outreach program is different, were average costs to be associated with each category, values of $25,000, $50,000, and $100,000 corresponding with the Low, Medium, and High values in table 3.4 would be reasonable. Concurrently, the number of targets reached would place public education and outreach costs between $10 and $100 per outreach effort. The higher values are generally associated with smaller projects wherein administrative and staff time account for a greater percentage of the budget.

4. Public Participation and Involvement.

Public participation and involvement is a required MCM under NPDES permits. The goal of public participation and involvement is not to change behaviors, but to increase public awareness and support for overall watershed maintenance activities. All WMG jurisdictional entities undertake a range of public participation and involvement activities as delineated in WMG jurisdictional entity MCM census.

The stated goals are to achieve broad public support through participation in the decision making process, shorter implementation schedules due to fewer obstacles in the form of public and legal challenges, a broader base of expertise from free intellectual resources, and to act as a conduit between other governmental programs.

Public participation and involvement best management practices (BMPs) do not focus on changing behaviors in favor of pro-environmental behaviors. Instead, actions like public meetings, resident panels, volunteer events, storm drain stenciling, community cleanups, and resident watch groups are the core focus of this MCM. Although some of these activities could theoretically lead to a reduction in pollutant load, they are not significant contributors nor is pollutant load reduction the core goal. Consequently, the public participation and involvement MCM is best viewed through the lens of the public education and outreach MCM which it supports.

Figure 2, below, shows the public education and outreach states, highlighted in bold, that are targeted by investment in the public participation and involvement MCM. Any level of public involvement increases awareness of the fundamental issues. As discussed in section 3.C, above, a general increase in the population wide level of awareness improves the results of all subsequent outreach activities in effectuating behavior changes. The entrenchment of a moral or social norm similarly increases the rate of adoption of pro-environmental changes as does a positive attitude or perception that a behavior is within one's control.

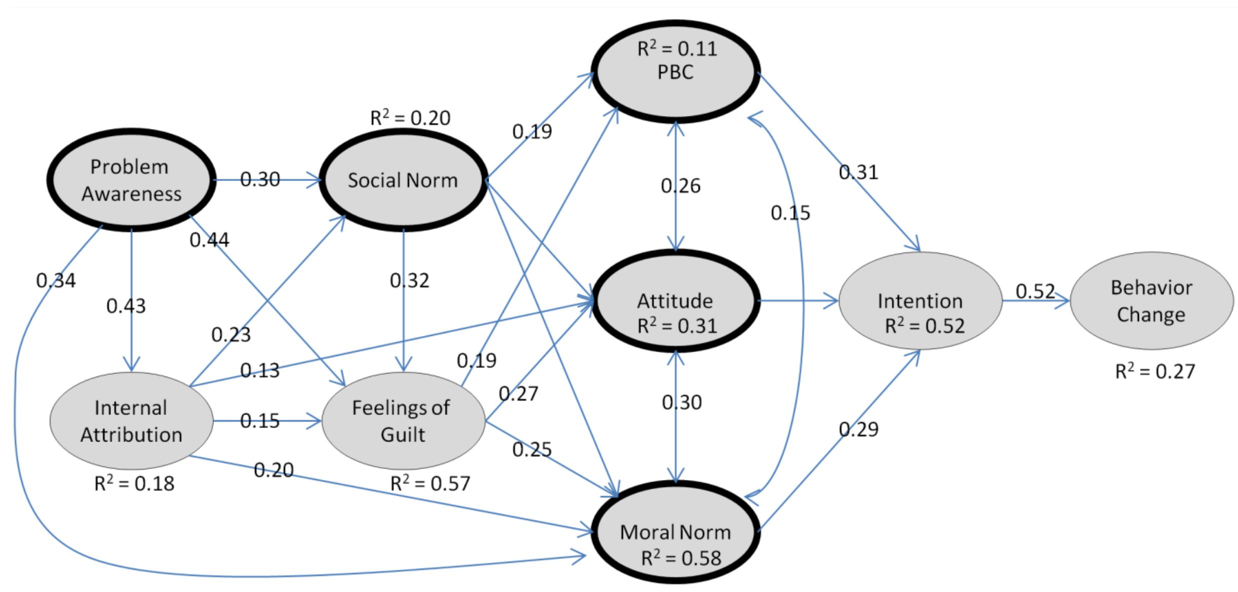

Figure 2. Bolded outreach states are the core emphasis of the Public Participation and Involvement MCM which provide support and foundation for more effective Public Education and Outreach.

Public participation and involvement BMPs predominantly include municipal support of volunteer activities process changes of mandatory municipal hearings to ensure the public voice can be heard. As a result, public participation and involvement BMPs are extremely price efficient despite not resulting in substantial behavior change on their own. Moreover, public participation and involvement increases the general level of commitment to watershed activities. This commitment translates into support during elections and pressure on politicians to continue funding the MCMs that do translate into substantive behavior changes and reductions in the total pollutant load.

5. Pollution Prevention and Good Housekeeping.

Pollution prevention and good housekeeping is a required MCM under NPDES permits to help ensure a reduction in the amount and type of pollution that (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from action such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems. The primary target of this MCM is local municipalities, although some municipal actions may increase requirements of private entities within the jurisdiction.

All WMG jurisdictional entities undertake a range of pollution prevention and good housekeeping activities as delineated in WMG jurisdictional entity MCM census.

a. Estimated measurement of behavior change.

Pollution prevention and good housekeeping is a unique MCM in terms of estimation of behavior change because the majority of actors are municipal employees or tenants on municipal property. The rate of behavior could be set as high as 100% if sufficient resources were allocated to municipal enforcement. In reality, a 100% compliance rate is unlikely as individual actors will always have incentive to avoid compliance and even good intentioned actors will occasionally have accidents.

A reasonable estimation of behavior change is 80%, allowing for some accidents, some holdouts, and the natural variation between different pollution prevention and good housekeeping efforts. This value is substantially higher than the highest average rate of behavior change for public education and outreach.

b. Identification of polluting behavior and pollutant.

Similar to public education and outreach efforts, pollution prevention and good housekeeping activities must initially be linked to a behavior and a set of pollutants following from said behavior. The Center for Watershed Protection lists the most common municipal and good housekeeping behaviors and the pollutants associated with them as shown on table 5.1, below.

Table 5.1

Pollution generating activity	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Hotspot Facility Management							
Vehicle repair	○	○	●	X	X	●	
Vehicle fueling	X	○	●	X	X	●	
Vehicle washing	●	●	⊙	X	X	●	
Vehicle storage	○	X	⊙	X	⊙	○	
Outdoor loading	●	⊙	⊙	X	X	○	
Outdoor storage	●	⊙	⊙	X	X	⊙	

Pollution generating activity	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Waste management	○	⊙	⊙	X	⊙	●	
Building repair	●	○	⊙	X	X	⊙	
Building maintenance	●	X	●	X	X	⊙	
Parking lot maintenance	●	○	⊙	X	X	⊙	
Turf management	⊙	●	X	X	X	●	Pesticide
Landscaping	○	●	X	X	X	●	Pesticide
Swimming pool discharge	X	X	X	X	X	X	Chlorine
Construction Project Management							
Construction	●	○	○	X	⊙	⊙	
Street Repair and Maintenance							
Street maintenance	⊙	X	⊙	X	⊙	⊙	
Bridge maintenance	○	X	⊙	X	⊙	⊙	
Right-of-way maintenance	⊙	●	X	X	X	●	Pesticide
Street Sweeping							
Street sweeping	●	○	⊙	X	⊙	○	
Storm Drain Maintenance							
Maintenance of inlet/outlet system	⊙	○	○	X	⊙	○	
Maintenance of storm drain system	⊙	○	○	X	⊙	○	
Stormwater Hotline Response							
Control spills	X	○	X	X	X	●	
Control illicit discharge	⊙	○	○	●	X	●	
Control illegal dumping	○	○	○	X	●	●	
Park and Landscape Maintenance							
Turf management	⊙	●	X	X	X	●	Pesticide
Landscaping	○	●	X	X	X	●	Pesticide
Landscape waste management	○	○	X	X	X	X	
Residential Stewardship							
Storm drain stenciling	X	X	○	●	⊙	⊙	
Waste collection and recycling	X	X	⊙	⊙	●	⊙	
Hazardous waste collect	X	○	⊙	○	●	●	

Pollution generating activity	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Leaf and landscape collect	○	X	X	X	X	X	
Stormwater Management Practice Maintenance							
Stormwater management practice maintenance	⊙	⊙	⊙	○	X	○	Bacteria
Employee Training							
Employee training	●	●	●	●	●	●	Chloride
○ = minor pollutant contribution; ● = major pollutant contribution; ⊙ = moderate pollutant contribution; X = not a pollutant source							

c. Cost of pollution prevention and good housekeeping efforts.

The final element in estimating the pollutant load reduction from pollution prevention and good housekeeping efforts is to identify the average cost and the population reached by each mode of outreach. The Center for Watershed Protection provides general guidance on the issue as shown in table 5.2, below.

In interpreting the table, the following definitions are used:

- **Hit rate**. How effective the strategy is in reaching the target audience.
- **Adoption rate**. The proportion of the target audience will adopt the practice after learning about it.
- **Startup cost**. The cost to initially implement the strategy including outreach.
- **Ongoing cost**. The cost to maintain the strategy over several years.
- **Expertise**. The specialized knowledge or training needed to implement the strategy.

Table 5.2

Comparing different pollution prevention methodology costs and effectiveness.					
Public education or outreach methodology	Comparative Factors				
	Hit rate	Adoption rate	Startup cost	Ongoing cost	Expertise
Industrial NPDES permit	○	⊙	$	$	○
ID and refer non-filers	○	⊙	$$	$	⊙
Local hotspot regulation	⊙	⊙	$$	$$	⊙
Inspections	⊙	●	$$	$$$	●
Certification programs	⊙	●	$$$	$$$	●
Hotspot enforcement	●	●	$	$$	⊙
Passive bus. outreach	⊙	○	$$	$$	⊙
On-site tech assistance	○	●	$$	$$$	●
Training	○	●	$$$	$$$	●

Comparing different pollution prevention methodology costs and effectiveness.					
Public education or outreach methodology	Comparative Factors				
	Hit rate	Adoption rate	Startup cost	Ongoing cost	Expertise
Subsidies and discounts	○	⦿	$$	$$$	⦿
Business recognition	○	⦿	$	$	⦿
○ / $: low; ⦿ / $$: medium; ● / $$$: high					

The price estimates for pollution prevention and good housekeeping efforts are substantially lower than those of public education and outreach because the city has the capacity to mandate these reductions. Not surprisingly, the majority of low-hanging fruit for such efforts are already required by law. Environmentally preferred purchasing plan (EPPP) policies are required for any municipalities receiving a CalRecycle grant. Municipalities are required to use green fertilizers, educate staff about recycling policies, and so on.

In deciding to pursue a supplemental pollution prevention and good housekeeping effort, the following costs can be assumed:

Table 5.3

Estimation of staff hours required to implement pollution prevention or good housekeeping effort.	
Process	Staff Hours
Identify existing municipal operations	4 – 8
Collect information about each operation	20 – 40
Complete municipal operation analysis (MOA)	80 – 120
Focus pollution prevention and good housekeeping efforts	4 – 8
TOTAL PRELIMINARY BMP STUDY TIME	108 – 176
Conduct target BMPs (sample BMPs from the CWP to reference against)—Select One	120 – 240
■ Hotspot facility management	120 –240
■ Construction project management	80 – 160
■ Street repair and maintenance	60 – 120
■ Street sweeping	80 – 200
■ Storm drain maintenance	80 – 200
■ Stormwater hotline response	80 – 160
■ Park and landscape maintenance	120 –240
■ Residential stewardship	80 –200
■ Stormwater management practice maintenance	120 –240
■ Employee training	80 – 160
TOTAL PROGRAM TIME	Per program

Estimation of staff hours required to implement pollution prevention or good housekeeping effort.	
Process	Staff Hours
Evaluate progress	20 – 40
TOTAL BMP IMPLEMENTATION TIME (does not include time of staff to abide and follow BMP).	128 – 206 + program time

By estimating the cost of staffing between $50 and $100 per hour with all associated overhead, the development of a pollution prevention or good housekeeping effort costs between $6000 – $20,000 to develop. Implementation and ongoing enforcement costs an additional $3000 –$24,000 each year in addition to any material costs included in the program.

6. Estimating behavioral impact on pollutant category.

The literature on estimating the impact of behaviors on pollutant loads consistently uses results localized to the outreach effort as measures of impact. That is, a study on the cessation of illegal dumping will report the specific impact of the outreach effort as "collecting 8000 tires" or "closing 78 illegal dumping sites." The reason for this localized impact measurement is the difficulty in establishing a normalized measurement that works for all populations in all regions under all conditions. Public education and outreach is an MCM that is, by its nature, tailored for the target population, and therefore the results of any outreach effort are similarly tailored to that population. Achieving an impact of "closing 78 illegal dumping sites" might have been a monumental success in one jurisdiction while a few towns over it represent a nominal reduction in the overall number of illegal dumping sites. The behaviors of populations do not filter through tributaries and smooth into measureable pollutant levels regardless of the fact that the impact from the behaviors of residents does precisely that.

Despite the unique nature of each public education and outreach effort, each municipality's good housekeeping and pollution prevention abilities, and the responsiveness of each population to public outreach and participation, the underlying behaviors that are addressed by each MCM share certain characteristics. Reasonable assumptions can be made about those behaviors that allows for estimations of the impact of cessation of that behavior. For example, if a resident who dumps used motor oil into a stormwater drain system instead begins to recycle that oil, the impact of *that resident's* improper dumping is almost entirely negated. Comparatively, if a resident who routinely over waters their lawn adopts pro-environmental watering behaviors, a significant, but not complete, portion of *that resident's* overwatering impact will be negated because some level of overwatering is largely unavoidable. These two pollutant behaviors have different behavioral characteristics.

For each behavior we categorize the pollutant activity as *entirely*, *largely*, or *partially* the consequence of the polluting behavior. To return to our previous examples, in the case of used oil dumping into a stormwater system, the introduction of used oil is *entirely* the consequence of the polluting behavior. In the example of overwatering, the runoff of sediment is *partially* the result of the polluting behavior (e.g., watering too often) with the remainder caused by attributes such as soil saturation, angle or grade of the plot, naturally occurring precipitation, and reasonable watering behavior that still contribute to sedimentary runoff. The consequence of *entirely*, *largely*, and *partially* polluting behaviors is set at 100%, 66%, and 33%, respectively.

Pollutant contribution from a behavior is categorized by the literature as high, medium, or low. In assigning a value to those values a reasonable estimate is 90%, 60%, and 30%. These estimates, when taken with the *entirely*, *largely*, and *partially* estimates described below, provide a smooth estimation of overall pollution contribution of various behaviors. However, in interpreting them, all aforementioned caveats should be considered and additional consideration should be given to the unique characteristics of the population, geography, and prior outreach of the jurisdiction.

The pollutant contribution and polluting behavior percentages when taken together provide the following matrix of impacts:

Table 6.1

Matrix of polluting behavior and pollutant contribution impacts.				
		Polluting behavior type		
		Entirely (100%)	Largely (66%)	Partially (33%)
Pollutant contribution type	High (90%)	90.0%	59.4%	29.7%
	Medium (60%)	60.0%	39.6%	19.8%
	Low (30%)	30.0%	19.8%	9.9%

These assumptions provide a nominalized profile of a type of behavior in the abstract. Although specific behaviors can be reasonably categorized under these nominalized profiles, the unique challenges facing each population and each geographic jurisdiction introduce sufficient variation that specific results of a targeted MCM effort will be largely predicted by the intangible traits at the local level. The following behavior profiles and the categorization of specific pollutant behaviors beneath them are initial placements of prototypical behaviors and are not necessarily indicative of all, or even all within a predefined jurisdiction, behaviors.

Behaviors in each of the three categories (e.g., *entirely*, *largely*, and *partially*) are discussed and examined in turn.

a. Pollutants entirely the consequence of behavior.

Behaviors where the pollutant consequence of that behavior are *entirely* the result of the behavior tend to be binary. Behaviors like dumping used oil into the stormwater system or not doing so are entirely the result of the behavior. One-hundred percent of the impact of the pollutant can be attributed to the behavior.

The following table summarizes behaviors wherein the pollutant consequence of that behavior are *entirely* the result of the behavior. Table 6.2 incorporates the pollutant percentages from Table 6.1 along with the high, medium, and low pollutant impact classifications for various pollutant behaviors from Table 3.3, 3.4, and 5.1.

Table 6.2

List of pollutant behaviors entirely the consequence of behavior.							
Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Tree clearing	60.0%	60.0%	X	X	X	X	
Yard waste dumping	60.0%	90.0%	X	30.0%	30.0%	X	
Failing septic systems	30.0%	90.0%	X	90.0%	X	30.0%	
Pool discharges	X	X	X	X	X	90.0%	
HHW dumping	X	30.0%	90.0%	X	X	90.0%	Oil
Car fluid spills/dumping	X	X	60.0%	X	X	90.0%	Oil
Used oil spills/dumping	X	X	60.0%	X	X	90.0%	Oil
Connected downspouts	60.0%	90.0%	90.0%	60.0%	X	30.0%	Oil
Poor STP maintenance	90.0%	90.0%	90.0%	60.0%	90.0%	30.0%	Oil
Storm drain dumping	60.0%	30.0%	60.0%	60.0%	90.0%	90.0%	Oil
Recreation vehicle waste	X	90.0%	X	90.0%	90.0%	60.0%	Oil
Illegal dumping	30.0%	30.0%	30.0%	X	90.0%	90.0%	Oil
Prescription drugs drain	X	X	X	60.0%	X	90.0%	
Recreational boat waste	60.0%	X	X	60.0%	X	60.0%	Oil
Failure to recycle	X	X	90.0%	X	90.0%	X	
Landscape waste management	30.0%	30.0%	X	X	X	X	
Storm drain stenciling	X	X	30.0%	90.0%	60.0%	60.0%	
Waste collection and recycling	X	X	60.0%	60.0%	90.0%	60.0%	
Hazardous waste collect	X	30.0%	60.0%	30.0%	90.0%	90.0%	
Employee training	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	Chloride
X. Behavior does not contribute to this pollutant type.							

b. Pollutants largely the consequence of behavior.

Behaviors where the pollutant consequence of that behavior are *largely* the result of the behavior are actions where the pollutant can be reduced by taking some positive step. For example, improper fertilization can be reduced by learning about proper fertilization techniques, fertilizing at the right time of the year, and using the correct amount of fertilizer. Unlike with pollutants *entirely* the consequence of the behavior, the action is still undertaken, just undertaken properly.

Behaviors where the consequence is *largely* the result of the behavior include many pollution prevention and good housekeeping efforts taken by municipalities. Approximately 66% of the impact of the pollutant can be attributed to the behavior.

The following table summarizes behaviors where the pollutant consequence of that behavior are *largely* the result of the behavior. Table 6.3 incorporates the pollutant percentages from Table 6.1 along with the high, medium, and low pollutant impact classifications for various pollutant behaviors from Table 3.3, 3.4, and 5.1.

Table 6.3

List of pollutant behaviors largely the consequence of behavior.							
Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Improper fertilization	X	59.4%	X	X	X	19.8%	
Excess pesticide use	X	X	X	X	X	59.4%	
Added IC and bare soil	59.4%	19.8%	39.6%	X	39.6%	19.8%	Oil
Car wash water flows	39.6%	59.4%	39.6%	X	X	39.6%	Oil
Pet waste wash off	X	59.4%	X	59.4%	X	X	
Hobby farm run off	39.6%	59.4%	19.8%	39.6%	19.8%	X	
Horse / stable run off	X	59.4%	X	59.4%	X	X	
Vehicle repair	19.8%	19.8%	59.4%	X	X	59.4%	
Vehicle fueling	X	19.8%	59.4%	X	X	59.4%	
Vehicle washing	59.4%	59.4%	39.6%	X	X	59.4%	
Vehicle storage	19.8%	X	39.6%	X	39.6%	19.8%	
Outdoor loading	59.4%	39.6%	39.6%	X	X	19.8%	
Outdoor storage	59.4%	39.6%	39.6%	X	X	39.6%	
Waste management	19.8%	39.6%	39.6%	X	39.6%	59.4%	
Building repair	59.4%	19.8%	39.6%	X	X	39.6%	
Construction	59.4%	19.8%	19.8%	X	39.6%	39.6%	
Street sweeping	59.4%	19.8%	39.6%	X	39.6%	19.8%	
Stormwater management practice maintenance	39.6%	39.6%	39.6%	19.8%	X	19.8%	Bacteria
Leaf and landscape collect	19.8%	X	X	X	X	X	
X. Behavior does not contribute to this pollutant type.							

c. Pollutants partially the consequence of behavior.

Behaviors where the pollutant consequence of that behavior are *partially* the result of the behavior are actions that will still be taken to their full extent, just with some mitigation due to improved performance. For example, if a homeowner adopts pro-environmental behaviors with regards to overwatering, watering will still occur along with uncontrollable watering such as natural precipitation. Behaviors where the pollutant consequence of that behavior are *partially* the result of the behavior are distinct from those of "*largely* the consequence" by control of the pollutant itself. For example, the good housekeeping practice of proper municipal vehicle repair allows the municipality to *largely* control the pollutant because they control the pollutant source. Conversely, the good housekeeping practice of proper municipal parking lot maintenance only *partially* allows the municipality to control the pollutant because the pollutant source (vehicles, traffic, stormwater) is outside of their control and they only control the medium. Approximately 33% of the impact of the pollutant can be attributed to the behavior.

The following table summarizes behaviors where the pollutant consequence of that behavior are *partially* the result of the behavior. Table 6.4 incorporates the pollutant percentages from Table 6.1 along with the high, medium, and low pollutant impact classifications for various pollutant behaviors from Table 3.3, 3.4, and 5.1.

Table 6.4

List of pollutant behaviors partially the consequence of behavior.							
Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Over-watering	9.9%	19.8%	9.9%	X	9.9%	19.8%	
Extensive turf cover	9.9%	19.8%	X	X	X	19.8%	
Soil compaction	19.8%	19.8%	9.9%	9.9%	X	X	
Soil erosion	29.7%	19.8%	9.9%	9.9%	X	X	
Hosing/Leaf-blowing	29.7%	19.8%	19.8%	X	19.8%	9.9%	Oil
Buffer encroachment	9.9%	9.9%	9.9%	9.9%	9.9%	X	
Building maintenance	29.7%	X	29.7%	X	X	19.8%	
Parking lot maintenance	29.7%	9.9%	19.8%	X	X	19.8%	
Turf management	19.8%	29.7%	X	X	X	29.7%	Pesticide
Landscaping	9.9%	29.7%	X	X	X	29.7%	Pesticide
Street maintenance	19.8%	X	19.8%	X	19.8%	19.8%	
Bridge maintenance	9.9%	X	19.8%	X	19.8%	19.8%	
Right-of-way maintenance	19.8%	29.7%	X	X	X	29.7%	Pesticide
Maintenance of inlet/outlet system	19.8%	9.9%	9.9%	X	19.8%	9.9%	
Maintenance of storm drain system	19.8%	9.9%	9.9%	X	19.8%	9.9%	
X. Behavior does not contribute to this pollutant type.							

7. Sample of MCM evaluation.

The concepts discussed above allow for an estimation of the cost and reach of a sample MCM effort. For example, a mass media public education (passive education) and outreach campaign aimed at educating the public about the pollutant effects of overwatering and basic lawn care would have an estimated cost of $50,000 to start and $50,000 per year. It will reach a significant number of residents (high hit rate) but have a low adoption rate (18%). That is, if the outreach effort reached 1000 residents, 180 of them would adopt pro-environmental behaviors.

The impact of that behavior change on pollutant load varies on the polluting behavior type and the pollutant contribution type as discussed in Table 6.1. The matrix of polluting behavior types and pollutant contribution type are multiplied by the adoption rate to calculate an end matrix of behavior impact as shown in Table 7.1, below.

Table 7.1

End matrix of behavioral impact outputs from Public Education MCM efforts.

		Polluting behavior type					Polluting behavior type		
		Entirely (100%)	Largely (66%)	Partially (33%)			Entirely (100%)	Largely (66%)	Partially (33%)
Pollutant contribution type	High (90%)	90.0%	59.4%	29.7%	x.18	High (90%)	16.2%	10.7%	5.3%
	Medium (60%)	60.0%	39.6%	19.8%		Medium (60%)	10.8%	7.1%	3.6%
	Low (30%)	30.0%	19.8%	9.9%		Low (30%)	5.4%	3.6%	1.8%

Returning to the sample MCM effort of a mass media public education (passive education) and outreach campaign aimed at educating the public about the pollutant effects of overwatering and basic lawn care, the campaign is primarily aimed at two polluting behaviors of improper fertilization and over-watering.

Table 7.2

Mass media public education campaign around overwatering and lawn maintenance.

Residential Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Improper fertilization	X	●	X	X	X	○	
Over-watering	○	⊙	○	X	○	⊙	

Improper fertilization is a polluting behavior where the impact is *largely* the result of the behavior. Over-watering is a polluting behavior where the impact is *partially* the result of the behavior. As a result, the outreach campaign will have the following end impacts.

Table 7.3

Mass media public education campaign around overwatering and lawn maintenance.							
Residential Polluting Behavior	Storm Water Pollutants						
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins	Other
Improper fertilization	X	10.7%	X	X	X	3.6%	
Over-watering	O	3.6%	1.8%	X	1.8%	3.6%	

In interpreting the end impact, the percentages given are the percent of the pollution corrected for the population outreached. For example, the sample outreach effort would correct an estimated 10.7% of the nutrient pollution caused by improper fertilization for the entire population reached by the outreach effort. That is, of the sample population of 1000 residents reached, 180 adopted pro-environmental behaviors which reduced their personal nutrient pollution from improper fertilization by 59.4%, representing 10.7% of the entire nutrient pollution for the population of 1000 residents.

A final consideration is determining when the impact will be observed. Because the MCMs evaluated in this memorandum contemplate pollutants that are directly the result of human action, the pollutant load reduction will track closely with the cessation of that action, which can have a temporal element. Behavior may not change instantaneously, but may change gradually as messaging is reinforced. While modeling the pollutant load reduction may be approached as instantaneous with the conclusion of the MCM effort, additional field investigations regarding the time required for behaviors to change would be necessary to estimate anticipated trends of pollutant load reductions.

8. CONCLUSIONS

The overall average percent removal for all constituents and all activities varies depending on the social constructs that are implemented through the MCMs, the polluting behavior targeted, the type of pollutant that behavior affects, and the degree of control over which the City has over that behavior (e.g. employee's behavior can be affected more directly than the public's behavior).

Because the lower public education value used does not consider any of the other behavioral constructs that are affected by the outreach campaigns (guilt, social norm, etc.), this overall percent removal may be lower than what will be observed. Given the amount of behavior change that may be achieved with the MCMs that the dischargers are implementing and the degree of effects that this behavior change can have on pollutant discharge as shown in this analysis, it is reasonable to estimate a 5% mass load reduction associated with MCM implementation.

9. ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations should be taken into account when considering using the values presented.

- The percent removals are not based on specific geographic areas and may not apply equally to all geographic areas. For example, activities with a high degree of City control where they are performed by City employees, these may only apply to areas where City employees act, such as maintenance facilities or public buildings and may represent a fairly small portion of the entire pollutant load to a watershed of a particular pollutant. This geospatial variance is not taken into consideration in the averaging techniques employed.

- If only pollutant removals for activities with low degrees of City control – i.e. those that require public behavior change were to be included, the overall average percent removals would be lower. This assumes that the activities affective public behavior change do not achieve all the constructs necessary to maximize behavior change (Intention, Moral Norm, Attitude, Perceived Behavioral Control, Guilt, Social Norm, Internal Attribution, Problem Awareness).

- If all the constructs necessary to maximize behavior change were successfully achieved throughout the population of the City, then the percent removals would potentially be higher than the average values presented herein.

- The percent reductions are based on a theoretical assessment of the potential reduction that could occur for a specific pollutant within a limited geography should a behavior actually change with respect to the release of that pollutant. Specific field studies are few that have measured changes in pollutant loads as correlated with behavior change.

- The data is more thorough for the measurement of behavior change through the use of survey instruments and observations of random samples through a population to correlate the constructs with changed behavior. The relationship between the behavior change and a measured concentration of a pollutant in runoff is more tenuous and the authors are relying on theoretical relationships between behavior associated with use of certain materials and pollutant releases during the uses of those materials.

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Appendix A – List of estimated pollutant behavior impact ranges.

The following table summarizes the potential range of pollutant load reductions from different behaviors across stormwater pollutant types. The ranges are produced by taking the values calculated in Table 6.2 through 6.4 and multiplying them by 0.18 and 0.80. The 0.18 value is the most commonly observed impact of public education and outreach from a pure problem awareness campaign. The 0.80 value is the estimated effectiveness of pollution prevention and good housekeeping efforts mandated by municipalities.

When evaluating where a particular MCM effort will fall in the range, the following guidance is provided:

- For public education and outreach efforts, a safety factor is to rely on the 0.18 value (the lowest end of the range). A pattern of success, a chain of education efforts that build on each other, or a particularly large investment all justify moving higher in the range.
- For public participation and involvement, these MCMs typically do not seek to affect behavior change but rather lay the foundation to support public education and outreach efforts. To the extent that a public participation and involvement campaign does seek to affect behavior change, the same guidance for public education and outreach efforts applies.
- For pollution prevention and good housekeeping, the highest value should be used which reflects an 80% success rate in adopting and enforcing the new policy. A pattern of failure or lack of enforcement resources justifies moving lower in the range.

List of estimated pollutant behavior impact ranges.

Polluting Behavior	Storm Water Pollutants					
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins
Tree clearing	10.8% – 48.0%	10.8% – 48.0%	X	X	X	X
Yard waste dumping	10.8% – 48.0%	16.2% – 72.0%	X	5.4% – 24.0%	5.4% – 24.0%	X
Failing septic systems	5.4% – 24.0%	16.2% – 72.0%	X	16.2% – 72.0%	X	5.4% – 24.0%
Pool discharges	X	X	X	X	X	16.2% – 72.0%
HHW dumping	X	5.4% – 24.0%	16.2% – 72.0%	X	X	16.2% – 72.0%
Car fluid spills/dumping	X	X	10.8% – 48.0%	X	X	16.2% – 72.0%
Used oil spills/dumping	X	X	10.8% – 48.0%	X	X	16.2% – 72.0%
Connected downspouts	10.8% – 48.0%	16.2% – 72.0%	16.2% – 72.0%	10.8% – 48.0%	X	5.4% – 24.0%
Poor STP maintenance	16.2% – 72.0%	16.2% – 72.0%	16.2% – 72.0%	10.8% – 48.0%	16.2% – 72.0%	5.4% – 24.0%
Storm drain dumping	10.8% – 48.0%	5.4% – 24.0%	10.8% – 48.0%	10.8% – 48.0%	16.2% – 72.0%	16.2% – 72.0%
Recreation vehicle waste	X	16.2% – 72.0%	X	16.2% – 72.0%	16.2% – 72.0%	10.8% – 48.0%
Illegal dumping	5.4% – 24.0%	5.4% – 24.0%	5.4% – 24.0%	X	16.2% – 72.0%	16.2% – 72.0%
Prescription drugs drain	X	X	X	10.8% – 48.0%	X	16.2% – 72.0%
Recreational boat waste	10.8% – 48.0%	X	X	10.8% – 48.0%	X	10.8% – 48.0%
Failure to recycle	X	X	16.2% – 72.0%	X	16.2% – 72.0%	X

List of estimated pollutant behavior impact ranges.						
Polluting Behavior	Storm Water Pollutants					
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins
Landscape waste management	5.4% – 24.0%	5.4% – 24.0%	X	X	X	X
Storm drain stenciling	X	X	5.4% – 24.0%	16.2% – 72.0%	10.8% – 48.0%	10.8% – 48.0%
Waste collection and recycling	X	X	10.8% – 48.0%	10.8% – 48.0%	16.2% – 72.0%	10.8% – 48.0%
Hazardous waste collect	X	5.4% – 24.0%	10.8% – 48.0%	5.4% – 24.0%	16.2% – 72.0%	16.2% – 72.0%
Employee training	16.2% – 72.0%	16.2% – 72.0%	16.2% – 72.0%	16.2% – 72.0%	16.2% – 72.0%	16.2% – 72.0%
Improper fertilization	X	10.7% – 47.5%	X	X	X	3.6% – 15.8%
Excess pesticide use	X	X	X	X	X	10.7% – 47.5%
Added IC and bare soil	10.7% – 47.5%	3.6% – 15.8%	7.1% – 31.7%	X	7.1% – 31.7%	3.6% – 15.8%
Car wash water flows	7.1% – 31.7%	10.7% – 47.5%	7.1% – 31.7%	X	X	7.1% – 31.7%
Pet waste wash off	X	10.7% – 47.5%	X	10.7% – 47.5%	X	X
Hobby farm run off	7.1% – 31.7%	10.7% – 47.5%	3.6% – 15.8%	7.1% – 31.7%	3.6% – 15.8%	X
Horse / stable run off	X	10.7% – 47.5%	X	10.7% – 47.5%	X	X
Vehicle repair	3.6% – 15.8%	3.6% – 15.8%	10.7% – 47.5%	X	X	10.7% – 47.5%
Vehicle fueling	X	3.6% – 15.8%	10.7% – 47.5%	X	X	10.7% – 47.5%
Vehicle washing	10.7% – 47.5%	10.7% – 47.5%	7.1% – 31.7%	X	X	10.7% – 47.5%
Vehicle storage	3.6% – 15.8%	X	7.1% – 31.7%	X	7.1% – 31.7%	3.6% – 15.8%
Outdoor loading	10.7% – 47.5%	7.1% – 31.7%	7.1% – 31.7%	X	X	3.6% – 15.8%
Outdoor storage	10.7% – 47.5%	7.1% – 31.7%	7.1% – 31.7%	X	X	7.1% – 31.7%
Waste management	3.6% – 15.8%	7.1% – 31.7%	7.1% – 31.7%	X	7.1% – 31.7%	10.7% – 47.5%
Building repair	10.7% – 47.5%	3.6% – 15.8%	7.1% – 31.7%	X	X	7.1% – 31.7%
Construction	10.7% – 47.5%	3.6% – 15.8%	3.6% – 15.8%	X	7.1% – 31.7%	7.1% – 31.7%
Street sweeping	10.7% – 47.5%	3.6% – 15.8%	7.1% – 31.7%	X	7.1% – 31.7%	3.6% – 15.8%
Stormwater management practice maintenance	7.1% – 31.7%	7.1% – 31.7%	7.1% – 31.7%	3.6% – 15.8%	X	3.6% – 15.8%
Leaf and landscape collect	3.6% – 15.8%	X	X	X	X	X
Over-watering	1.8% – 7.9%	3.6% – 15.8%	1.8% – 7.9%	X	1.8% – 7.9%	3.6% – 15.8%
Extensive turf cover	1.8% – 7.9%	3.6% – 15.8%	X	X	X	3.6% – 15.8%
Soil compaction	3.6% – 15.8%	3.6% – 15.8%	1.8% – 7.9%	1.8% – 7.9%	X	X
Soil erosion	5.3% – 23.8%	3.6% – 15.8%	1.8% – 7.9%	1.8% – 7.9%	X	X
Hosing/Leaf-blowing	5.3% – 23.8%	3.6% – 15.8%	3.6% – 15.8%	X	3.6% – 15.8%	1.8% – 7.9%
Buffer encroachment	1.8% – 7.9%	1.8% – 7.9%	1.8% – 7.9%	1.8% – 7.9%	1.8% – 7.9%	X
Building maintenance	5.3% – 23.8%	X	5.3% – 23.8%	X	X	3.6% – 15.8%

List of estimated pollutant behavior impact ranges.						
Polluting Behavior	Storm Water Pollutants					
	Sediment	Nutrients	Metals	Bacteria	Trash	Toxins
Parking lot maintenance	5.3% – 23.8%	1.8% – 7.9%	3.6% – 15.8%	X	X	3.6% – 15.8%
Turf management	3.6% – 15.8%	5.3% – 23.8%	X	X	X	5.3% – 23.8%
Landscaping	1.8% – 7.9%	5.3% – 23.8%	X	X	X	5.3% – 23.8%
Street maintenance	3.6% – 15.8%	X	3.6% – 15.8%	X	3.6% – 15.8%	3.6% – 15.8%
Bridge maintenance	1.8% – 7.9%	X	3.6% – 15.8%	X	3.6% – 15.8%	3.6% – 15.8%
Right-of-way maintenance	3.6% – 15.8%	5.3% – 23.8%	X	X	X	5.3% – 23.8%
Maintenance of inlet/outlet system	3.6% – 15.8%	1.8% – 7.9%	1.8% – 7.9%	X	3.6% – 15.8%	1.8% – 7.9%
Maintenance of storm drain system	3.6% – 15.8%	1.8% – 7.9%	1.8% – 7.9%	X	3.6% – 15.8%	1.8% – 7.9%

X. Behavior does not contribute to this pollutant type.

Attachment O

Summary of Existing Structural BMPs in DC WMG

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This attachment includes tables summarizing the existing Best Management Practices (BMPs) implemented by the Dominguez Channel Watershed Management Group (DC WMG), corresponding with Section 4.2 of the DC WMG Enhanced Watershed Management Program (EWMP).

Attachment O List of Tables

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Table O.1: Number of Reported BMPs Maintained during 2010-2011 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
Structural BMPs									
Category	**Subcategory**	**BMPs**							
Regional	**Infiltration**	Infiltration Basin		3					**3**
	Detention								
	Constructed Wetland								
	Treatment Facilities								
	Low Flow Diversions	Diversion Structure						4	**4**
Distributed	**Site-Scale Detention**								
	Green Infrastructure	Biofilters		2					**2**
		Geo Block Porous Pavement					12		**12**
		Infiltration Trenches		1			42		**43**
	Flow-through Treatment BMPs								
	Source Control Structural BMPs	Abtech Ultra Urban Catch Basin Insert					82		**82**
		Automatic Retractable Screen Catch Basin (ARS)						179	**179**
		CDS Gross Pollutant Separators		1			14		**15**
		Clean Screen Catch Basin Inserts	15					60	**75**
		Connector Pipe Screens Catch Basin (CPS)						179	**179**
		Covered Material Bunkers	12						**12**
		Covered Trash Bins	15	1				2	**18**

Table O.1: Number of Reported BMPs Maintained during 2010-2011 by the DC WMG										
BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
Distributed	Source Control Structural BMPs (Continued)	Drain Pac Catch Basin Inserts					352		**352**
		Extra Trash Cans	62					159	**221**
		Floating Trash Booms						1	**1**
		Fossil Filter Catch Basin Inserts	1	43			198	4	**246**
		Grate Plate - Entrance						2	**2**
		Restaurant Vent Traps	44						**44**
		Sand Bag						800	**800**
		Sand Filter		3					**3**
		Signage & Stenciling		65					**65**
		Silt Fence						1	**1**
		Stormceptor Gross Pollutant Separators	6				9		**15**
		Straw Mulch						5	**5**
Institutional BMPs									
		Dog Parks	2				7		**9**
		Enhanced Street Sweeping	2					1	**3**

Table O.2: Number of Reported BMPs Maintained during 2011-2012 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
Structural BMPs									
Category	**Subcategory**	**BMPs**							
Regional	**Infiltration**	Infiltration Basin / Chamber		4					**4**
	Detention								
	Constructed Wetland								
	Treatment Facilities								
	Low Flow Diversions								
Distributed	**Site-Scale Detention**								
	Green Infrastructure	Bioretention Facility(planter box)					144		**144**
		Bioswale		4					**4**
		Filterra Biofiltration Unit						4	**4**
		Geo Block Porous Pavement					12		**12**
		Green Roof					1		**1**
		Infiltration Trenches		1			44	3	**48**
		Vegetated Swale/Strip					29		**29**
	Flow-through Treatment BMPs								
	Source Control Structural BMPs	Abtech Ultra Urban Catch Basin Insert					82		**82**
		Automatically Retractable Screens (ARS)						160	**160**
		Catch Basin Connector Pipe Full Capture(CPS)						193	**193**

Table O.2: Number of Reported BMPs Maintained during 2011-2012 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
Distributed	Source Control Structural BMPs (Continued)	Catch Basin Insert					2		**2**
		Catch Basin Opening Screen					3460		**3460**
		CDS Gross Pollutant Separators		1			17		**18**
		Check Dam						3	**3**
		Clean Screen Catch Basin Inserts	15					15	**30**
		Concrete Washout Containers						3	**3**
		Covered Material Bunkers	12					59	**71**
		Covered Trash Bins	15	1				12	**28**
		Covered Waste Fuel Tanks						1	**1**
		Drain Pac Catch Basin Inserts					352		**352**
		Extra Trash Cans	62					182	**244**
		Fiber Rolls						6	**6**
		Fossil Filter Catch Basin Inserts	1	43			237	18	**299**
		Gravel Bag Berm						4	**4**
		Jensen					1		**1**
		Potable Water / Irrigation						4	**4**
		Restaurant Vent Traps	44						**44**
		Sand Filter		4			1		**5**
		Sandbags						821	**821**

Table O.2: Number of Reported BMPs Maintained during 2011-2012 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
Distributed	Source Control Structural BMPs (Continued)	Secondary Containment for Waste Oil Tanks						1	**1**
		Sediment Trap						5	**5**
		Shakers						2	**2**
		Signage & Stenciling		73					**73**
		Slope Stabilization						2	**2**
		Soil Stabilizer Tracking Control						2	**2**
		Spill Containment-Temp. Hazardous Material Storage						4	**4**
		Spill Prevention & Control						4	**4**
		Stabilized Construction Entrance/Exit						35	**35**
		Steel Plate						30	**30**
		Stormceptor Gross Pollutant Separators	6				9	6	**21**
		Storm Drain Inlet Protection						26	**26**
		Trench Drain Inlet						2	**2**
		Upgraded Fuel System with Canopy						2	**2**
Institutional BMPs									
		Concrete Curing			38				**38**
		Concrete Finishing			38				**38**
		Concrete Waste Management			15				**15**
		Dog Parks	2	7					**9**

Table O.2: Number of Reported BMPs Maintained during 2011-2012 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
		Dust Control			2				**2**
		Erosion Control			4				**4**
		Enhanced Street Sweeping	2					61	**63**
		Hazardous Waste Management						3	**3**
		Liquid Waste Management			1				**1**
		Material Delivery & Storage			4				**4**
		Off-site Vehicle & Equipment Fueling			7				**7**
		Paving & Grinding Operations			8				**8**
		Preservation of Existing Vegetation			4				**4**
		Sanitary Septic Waste Management			4				**4**
		Scheduling			1				**1**
		Solid Waste Management						7	**7**
		Stockpile Management			12				**12**
		Vehicle & Equipment Maintenance			4				**4**
		Water Conservation Practices			4				**4**
		Water Trucks			2				**2**
		Wind Erosion Control			7				**7**

Table O.3: Number of Reported BMPs Installed during 2010-2011 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	City of Los Angeles	County of Los Angeles	Total
Structural BMPs									
Category	**Subcategory**	**BMPs**							
Regional	**Infiltration**	Infiltration Basin, Chamber, Pit		2					**2**
	Detention								
	Constructed Wetland								
	Treatment Facilities								
	Low Flow Diversions								
Distributed	**Site-Scale Detention**								
	Green Infrastructure	Bioswale		1					**1**
		Infiltration Trenches					5		**5**
	Flow-through Treatment BMPs								
	Source Control Structural BMPs	Abtech Ultra Urban Catch Basin Insert					16		**16**
		Automatic Retractable Screens Catch Basin (ARS)			179				**179**
		Clean Screen Catch Basin Inserts						1	**1**
		Connector Pipe Screens Catch Basin (CPS)			179				**179**
		Covered Trash Bins						2	**2**
		Fossil Filter Catch Basin Inserts					25		**25**
		Grate Plate Entrance			2				**2**
		Sand Filter		1					**1**

Table O.3: Number of Reported BMPs Installed during 2010-2011 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	City of Los Angeles	County of Los Angeles	Total
	Source Control Structural BMPs (Continued)	Sandbag			300				**300**
		Signage & Stenciling		10					**10**
		Silt Fence			1				**1**
		Straw Mulch			5				**5**
Institutional BMPs									
		Enhanced Street Sweeping						1	**1**

Table O.4: Number of Reported BMPs Installed during 2011-2012 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
Structural BMPs									
Category	**Subcategory**	**BMPs**							
Regional BMPs	**Infiltration**	Infiltration Basin, Chamber, Pit, Trench		1	3				**4**
	Detention	Detention Basin							**1**
	Constructed Wetland								
	Treatment Facilities								
	Low Flow Diversions								
Distributed BMPs	**Site-Scale Detention**								
	Green Infrastructure	Bio-retention Facility					15		**15**
		Bioswale		2	1				**3**
		Dry Well			1				**1**
		Filterra Biofiltration Unit						4	**4**
		Green Roof					1		**1**
		Infiltration Trenches			2		2	1	**5**
		Vegetated Swales			1		3		**4**
	Flow-through Treatment BMPs								
	Source Control Structural BMPs	Abtech Ultra Urban Catch Basin Insert					16		**16**
		Catch Basin Inserts (various)			21	2	3		**26**
		Catch Basin Opening Screen					502		**502**

Table O.4: Number of Reported BMPs Installed during 2011-2012 by the DC WMG										
BMP Type			**El Segundo**	**Hawthorne**	**Inglewood**	**Lomita**	**Los Angeles**	**County of Los Angeles**	**Total**
Distributed	**Source Control Structural BMPs (Continued)**	CDS Gross Pollutant Separators					3		**3**
		Check Dams						3	**3**
		Clean Screen Catch Basin Inserts						4	**4**
		Covered Trash Bins			5				**5**
		Fossil Filter Catch Basin Inserts					39		**39**
		Fueling Area Control				1			**1**
		Gravel Bag Berm						4	**4**
		Jensen					1		**1**
		Rooftop Runoff Control				1			**1**
		Sand Filter		1			1		**2**
		Signage & Stenciling		8		3			**11**
		Silt Fence						4	**4**
		Stabilized Construction Entrance/Exit						6	**6**
		Storm Drain Inlet Protection						12	**12**
		StormFilter			3				**3**
		Trash Storage Area				1			**1**
		Vertex Separator				1			**1**
Institutional BMPs									
		Concrete Curing						15	**15**

Table O.4: Number of Reported BMPs Installed during 2011-2012 by the DC WMG

BMP Type			El Segundo	Hawthorne	Inglewood	Lomita	Los Angeles	County of Los Angeles	Total
		Concrete Finishing						5	**5**
		Concrete Waste Management						5	**5**
		Enhanced Street Sweeping						3	**3**
		Hazardous Waste Management						3	**3**
		Offsite Vehicle & Equipment Fueling						2	**2**
		Paving & Grinding Operations						2	**2**
		Potable Water/ Irrigation						2	**2**
		Preservation of Existing Vegetation						4	**4**
		Sanitary Septic Waste Management						3	**3**
		Scheduling						1	**1**
		Solid Waste Management						4	**4**
		Spill Prevention & Control						3	**3**
		Stockpile Management						8	**8**
		Vehicle & Equipment Maintenance						2	**2**
		Water Conservation Practices						3	**3**
		Wind Erosion Control						3	**3**

Table O.5: City of Los Angeles/Inglewood BMPs in the DC WMG

BMP Type			Los Angeles	Total
Structural BMPs				
Category	**Subcategory**	**BMPs**		
Regional	**Infiltration**	Infiltration System Peck Park Canyon Stormwater Enhancement Rosecrans Recreational Center Stormwater Enhancements Wilmington Drain Rehabilitation	3	**3**
	Detention	Detention System Peck Park Canyon Stormwater Enhancement Rosecrans Recreational Center Stormwater Enhancements Wilmington Drain Rehabilitation	3	**3**
	Constructed Wetland			
	Treatment Facilities			
	Low Flow Diversions			
Distributed	**Site-Scale Detention**			
	Green Infrastructure	Bio-retention Planters Peck Park Canyon Stormwater Enhancement Rosecrans Recreational Center Stormwater Enhancements Wilmington Drain Rehabilitation	3	**3**
		Drought Tolerant Plants Peck Park Canyon Stormwater Enhancement Rosecrans Recreational Center Stormwater Enhancements Wilmington Drain Rehabilitation	3	**3**
	Flow-through Treatment BMPs			
	Source Control Structural BMPs			
Institutional BMPs				
		Stormwater Re-use Peck Park Canyon Stormwater Enhancement Rosecrans Recreational Center Stormwater Enhancements Wilmington Drain Rehabilitation Well 7	4	**4**

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	**Data Source**	**BMP Category**	**Project Description**	**Address**	**Latitude**	**Longitude**	**Date Active**
Hawthorne							
1	SUSMP	Institutional	Storm Drain Stencil and Signage	1 Northrop Ave	33.920038	-118.334708	12/7/2005
2	SUSMP	Source Control	7 Filter Inserts	1 Northrop Ave	33.920038	-118.334708	12/7/2005
3	SUSMP	Institutional	Storm Drain Stencil and Signage	10320 Cerise Ave	33.919236	-118.333397	
4	SUSMP	Source Control	Clarifier	10320 Cerise Ave	33.919236	-118.333397	
5	SUSMP	Institutional	Storm Drain Stencil and Signage	11330 Hawthorne Blvd	33.931214	-118.352108	9/22/2004
6	SUSMP	Source Control	3 Filter Inserts	11330 Hawthorne Blvd	33.931214	-118.352108	9/22/2004
7	SUSMP	Green Infrastructure	Vegetated Swale	11436 Hawthorne Blvd	33.930169	-118.351858	4/30/2007
8	SUSMP	Institutional	Storm Drain Stencil and Signage	11436 Hawthorne Blvd	33.930169	-118.351858	4/30/2007
9	SUSMP	Source Control	3 Filter Inserts	11436 Hawthorne Blvd	33.930169	-118.351858	4/30/2007
10	SUSMP	Institutional	Storm Drain Stencil and Signage	11540 Hawthorne Blvd	33.929622	-118.352097	
11	SUSMP	Source Control	1 Filter Insert	11540 Hawthorne Blvd	33.929622	-118.352097	
12	SUSMP	Institutional	Storm Drain Stencil and Signage	11604 Prairie Ave	33.928614	-118.343183	10/21/2002
13	SUSMP	Source Control	1 Filter Insert	11604 Prairie Ave	33.928614	-118.343183	10/21/2002
14	SUSMP	Institutional	Oil-Water Separator	11643 S Prairie Ave	33.928367	-118.344144	
15	SUSMP	Institutional	Storm Drain Stencil and Signage	11643 S Prairie Ave	33.928367	-118.344144	
16	SUSMP	Institutional	Storm Drain Stencil and Signage	11646 Prairie Ave	33.928158	-118.343464	10/21/2002
17	SUSMP	Source Control	1 Filter Insert	11646 Prairie Ave	33.928158	-118.343464	10/21/2002
18	SUSMP	Green Infrastructure	33 Filterra Biotreatment System	12013 S Van Ness Ave	33.923447	-118.317603	6/25/2007
19	SUSMP	Source Control	Oil-Sediment Separator	12013 S Van Ness Ave	33.923447	-118.317603	6/25/2007
20	SUSMP	Institutional	Storm Drain Stencil and Signage	12101 Crenshaw Blvd	33.922183	-118.326969	7/17/2008
21	SUSMP	Source Control	4 Filter Inserts	12101 Crenshaw Blvd	33.922183	-118.326969	7/17/2008
22	SUSMP	Source Control	1 Sand Filter	12101 Crenshaw Blvd	33.922183	-118.326969	7/17/2008
23	SUSMP	Institutional	Storm Drain Stencil and Signage	12200 Wilkie Way	33.920656	-118.322111	
24	SUSMP	Source Control	6 Filter Inserts	12200 Wilkie Way	33.920656	-118.322111	
25	SUSMP	Source Control	3 Filter Inserts	12501 S Hawthorne Blvd	33.919569	-118.353169	6/21/2002
26	SUSMP	Source Control	3 Filter Inserts	12923 Inglewood Ave	33.9149	-118.361669	
27	SUSMP	Institutional	Storm Drain Stencil and Signage	13436 Roselle Ave	33.909836	-118.342533	
28	SUSMP	Source Control	4 Filter Inserts	13436 Roselle Ave	33.909836	-118.342533	
29	SUSMP	Institutional	Storm Drain Stencil and Signage	13811 Cordary Ave	33.906167	-118.34175	4/20/2006
30	SUSMP	Source Control	1 Filter Insert	13811 Cordary Ave	33.906167	-118.34175	4/20/2006
31	SUSMP	Institutional	Storm Drain Stencil and Signage	13914-13928 Lemoli Ave	33.904964	-118.33065	8/15/2006
32	SUSMP	Source Control	2 Filter Insert	13914-13928 Lemoli Ave	33.904964	-118.33065	8/15/2006
33	SUSMP	Institutional	Storm Drain Stencil and Signage	14250 S Prairie Ave	33.902242	-118.343269	2/10/2005
34	SUSMP	Source Control	2 Filter Insert	14250 S Prairie Ave	33.902242	-118.343269	2/10/2005
35	SUSMP	Green Infrastructure	3 Grass Swales	1440 Hindry Ave	33.900886	-118.371842	
36	SUSMP	Green Infrastructure	3 Dry Wells	1440 Hindry Ave	33.900886	-118.371842	
37	SUSMP	Institutional	Storm Drain Stencil and Signage	1440 Hindry Ave	33.900886	-118.371842	
38	SUSMP	Source Control	1 Filter Insert	1440 Hindry Ave	33.900886	-118.371842	
39	SUSMP	Institutional	Storm Drain Stencil and Signage	14600 Ocean Gate Ave	33.898469	-118.366183	
40	SUSMP	Source Control	3 Filter Inserts	14600 Ocean Gate Ave	33.898469	-118.366183	
41	SUSMP	Institutional	Storm Drain Stencil and Signage	14610 Hindry Ave	33.900886	-118.371592	
42	SUSMP	Source Control	(# Unknown) Filter Inserts	14610 Hindry Ave	33.900886	-118.371592	
43	SUSMP	Institutional	Storm Drain Stencil and Signage	14900 Hindry Ave	33.897167	-118.371086	
44	SUSMP	Source Control	9 Filter Inserts	14900 Hindry Ave	33.897167	-118.371086	
45	SUSMP	Green Infrastructure	9 Filterra Biotreatment System	2301 W 120th St	33.924389	-118.320328	7/24/2007
46	SUSMP	Institutional	Storm Drain Stencil and Signage	2301 W 120th St	33.924389	-118.320328	7/24/2007
47	SUSMP	Source Control	9 Filter Inserts	2301 W 120th St	33.924389	-118.320328	7/24/2007
48	SUSMP	Source Control	1 Vortex Separator	2301 W 120th St	33.924389	-118.320328	7/24/2007
49	SUSMP	Green Infrastructure	9 Filterra Biotreatment System	2400 El Segundo Blvd	33.916225	-118.319208	3/6/2007
50	SUSMP	Infiltration	4 Infiltration Systems	2400 El Segundo Blvd	33.916225	-118.319208	3/6/2007
51	SUSMP	Institutional	Storm Drain Stencil and Signage	2400 El Segundo Blvd	33.916225	-118.319208	3/6/2007

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG

ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
52	SUSMP	Source Control	35 Filter Inserts	2400 El Segundo Blvd	33.916225	-118.319208	3/6/2007
53	SUSMP	Institutional	Storm Drain Stencil and Signage	2750 W 120th St	33.916225	-118.324339	
54	SUSMP	Source Control	1 Filter Insert	2750 W 120th St	33.916225	-118.324339	
55	SUSMP	Source Control	1 Vortex Separator	2750 W 120th St	33.916225	-118.324339	
56	SUSMP	Institutional	Storm Drain Stencil and Signage	2800 W 120th St	33.922392	-118.324128	
57	SUSMP	Source Control	11 Filter Insert	2800 W 120th St	33.922392	-118.324128	
58	SUSMP	Institutional	Storm Drain Stencil and Signage	2808, 2815 El Segundo Blvd	33.9182	-118.328461	
59	SUSMP	Source Control	3 Filter Inserts	2808, 2815 El Segundo Blvd	33.9182	-118.328461	
60	SUSMP	Source Control	1 CDS Unit	2808, 2815 El Segundo Blvd	33.9182	-118.328461	
61	SUSMP	Source Control	5 Filter Inserts	2831-2909 W 120th St	33.924075	-118.324422	
62	SUSMP	Institutional	Storm Drain Stencil and Signage	2891 W 120th St	33.924247	-118.325311	
63	SUSMP	Source Control	2 Filter Inserts	2891 W 120th St	33.924247	-118.325311	
64	SUSMP	Source Control	21 Filter Inserts	3329-3525 Jack Northrop Ave	33.919906	-118.332789	12/21/2006
65	SUSMP	Institutional	Storm Drain Stencil and Signage	3440 W El Segundo Blvd	33.916169	-118.333742	10/17/2003
66	SUSMP	Source Control	1 CDS Unit	3440 W El Segundo Blvd	33.916169	-118.333742	10/17/2003
67	SUSMP	Institutional	Landscape Design	4569 El Segundo Blvd	33.916169	-118.371753	4/9/2002
68	SUSMP	Source Control	4 Filter Inserts	4773 W El Segundo Blvd	33.916603	-118.360833	2/23/2006
69	SUSMP	Source Control	1 Oil-Water Separator	4773 W El Segundo Blvd	33.916603	-118.360833	2/23/2006
70	SUSMP	Institutional	Storm Drain Stencil and Signage	4775 Rosecrans Ave	33.90225	-118.360906	
71	SUSMP	Source Control	4 Filter Inserts	4775 Rosecrans Ave	33.90225	-118.360906	
72	SUSMP	Institutional	Storm Drain Stencil and Signage	4859 W El Segundo	33.916836	-118.363317	10/10/2005
73	SUSMP	Source Control	2 Filter Inserts	4859 W El Segundo	33.916836	-118.363317	10/10/2005
74	SUSMP	Institutional	Storm Drain Stencil and Signage	4917 W 147th St	33.898028	-118.364358	
75	SUSMP	Source Control	3 Filter Inserts	4917 W 147th St	33.898028	-118.364358	
76	SUSMP	Institutional	Storm Drain Stencil and Signage	4951 W 119th St	33.925528	-118.365189	
77	SUSMP	Source Control	15 Filter Inserts	4951 W 119th St	33.925528	-118.365189	
78	SUSMP	Institutional	Storm Drain Stencil and Signage	5100 Rosecrans Ave	33.901086	-118.36845	
79	SUSMP	Source Control	6 Filter Inserts	5100 Rosecrans Ave	33.901086	-118.36845	
80	SUSMP	Source Control	Clarifier	5100 Rosecrans Ave	33.901086	-118.36845	
81	SUSMP	Source Control	1 Filter Insert	5105 W Rosecrans Ave	33.902253	-118.367225	8/13/2007
82	SUSMP	Source Control	1 Clarifier	5105 W Rosecrans Ave	33.902253	-118.367225	8/13/2007
83	SUSMP	Source Control	1 Filter Insert	5111 Marine Ave	33.894806	-118.368011	
84	SUSMP	Source Control	1 CDS Unit	Aviation Blvd. and Marine Ave	33.894511	-118.378467	11/29/2004
85	SUSMP	Infiltration	1 Cultec Infiltration System	NWC Hawthorne and 120th St	33.923914	-118.353072	3/13/2007
86	SUSMP	Institutional	Storm Drain Stencil and Signage	NWC Hawthorne and 120th St	33.923914	-118.353072	3/13/2007
87	SUSMP	Source Control	2 Filter Inserts	NWC Hawthorne and 120th St	33.923914	-118.353072	3/13/2007
88	SUSMP	Source Control	3 Filter Inserts	11524 Hawthorne Blvd	33.929597	-118.352144	9/14/2005
89	SUSMP	Green Infrastructure	Filterra Biotreatment System	NEC Aviation Blvd And El Segundo Blvd	33.916572	-118.3782	3/6/2007
90	SUSMP	Infiltration	3 Infiltration Systems	NEC Aviation Blvd And El Segundo Blvd	33.916572	-118.3782	3/6/2007
91	SUSMP	Source Control	1 Filter Insert	NEC Aviation Blvd And El Segundo Blvd	33.916572	-118.3782	3/6/2007
92	SUSMP	Institutional	Storm Drain Stencil and Signage	13812 Cordary Ave	33.906139	-118.341575	4/19/2006
93	SUSMP	Source Control	1 Filter Insert	13812 Cordary Ave	33.906139	-118.341575	4/19/2006
94	SUSMP	Source Control	Sand Filter	4150 W El Segundo Blvd	33.916625	-118.344144	
95	SUSMP	Source Control	Filter Inserts	4150 W El Segundo Blvd	33.916625	-118.344144	
96	SUSMP	Infiltration	Infiltration Gravel Basin	11300 Hawthorne Blvd	33.931572	-118.352778	
97	SUSMP	Source Control	1 C.B. Filter Insert	11300 Hawthorne Blvd	33.931572	-118.352778	
98	SUSMP	Green Infrastructure	Bio-Retention Boxes	4730 Imperial Hwy	33.930783	-118.360114	
99	SUSMP	Infiltration	Infiltration Trench	3211 Northrop Ave	33.919853	-118.330044	
100	SUSMP	Source Control	2 CB Filter Inserts	3211 Northrop Ave	33.919853	-118.330044	
101	SUSMP	Source Control	Sand Filter	3211 Northrop Ave	33.919853	-118.330044	
102	SUSMP	Permeable Pavement	Permeable Unit Paver	4160 W El Segundo Blvd	33.916244	-118.347406	
103	SUSMP	Permeable Pavement	Permeable Unit Paver	4320 Imperial Hw	33.930756	-118.352006	
104	SUSMP	Green Infrastructure	Drywell	1 Rocket Rd	33.919981	-118.326825	

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	**Data Source**	**BMP Category**	**Project Description**	**Address**	**Latitude**	**Longitude**	**Date Active**
105	SUSMP	Green Infrastructure	Vegetated Swale	1 Rocket Rd	33.919981	-118.326825	
106	SUSMP	Green Infrastructure	Bio-Retention Box	14441 Inglewood Ave	33.900197	-118.362019	
107	SUSMP	Source Control	4 C.B. Filter Inserts	14441 Inglewood Ave	33.900197	-118.362019	
108	SUSMP	Permeable Pavement	Permeable Unit Paver	13403 Kornblum Ave	33.910772	-118.337406	
109	SUSMP	Infiltration	Infiltration Chamber	11300 Hawthorne Blvd	33.931828	-118.352364	
110	SUSMP	Source Control	Filter Inserts	11300 Hawthorne Blvd	33.931828	-118.352364	
111	SUSMP	Permeable Pavement	Permeable Unit Paver	Various			
112	SUSMP	Infiltration	Infiltration Chambers	On Hawthorne Blvd from El Segundo Blvd to Rosecrans Ave			
Inglewood							
1	SUSMP	Source Control	Grease Interceptor	401 E Hillcrest Blvd	33.961078	-118.349833	4/4/2013
2	SUSMP	Infiltration	Infiltration System	1155 W Arbor Vitae St	33.954914	-118.376772	2/8/2006
3	SUSMP	Source Control	Filter Inserts	1155 W Arbor Vitae St	33.954914	-118.376772	2/8/2006
4	SUSMP	Institutional	Storm Drain Stencils	1155 W Arbor Vitae St	33.954914	-118.376772	2/8/2006
5	SUSMP	Source Control	Grease Interceptor	3900 W Manchester Blvd	33.957556	-118.341972	5/17/2013
6	SUSMP	Source Control	Filter Inserts	3900 W Manchester Blvd	33.957556	-118.341972	5/17/2013
7	SUSMP	Infiltration	Infiltration System	3000 W Century Blvd	33.945136	-118.32595	5/28/2013
8	SUSMP	Source Control	Inlet Filters	3000 W Century Blvd	33.945136	-118.32595	5/28/2013
9	SUSMP	Source Control	Trench Filters	3000 W Century Blvd	33.945136	-118.32595	5/28/2013
10	SUSMP	Infiltration	Infiltration System	215 W 94th St	33.950933	-118.35745	7/9/2013
11	SUSMP	Source Control	Inlet Filters	215 W 94th St	33.950933	-118.35745	7/9/2013
12	SUSMP	Source Control	Trench Filters	215 W 94th St	33.950933	-118.35745	7/9/2013
13	SUSMP	Green Infrastructure	Dry Well	8090 S Crenshaw Blvd	33.960119	-118.326706	7/16/2013
14	SUSMP	Source Control	Inlet Filters	8090 S Crenshaw Blvd	33.960119	-118.326706	7/16/2013
15	SUSMP	Source Control	Trench Filters	8090 S Crenshaw Blvd	33.960119	-118.326706	7/16/2013
16	SUSMP	Source Control	Trash Enclosure	8090 S Crenshaw Blvd	33.960119	-118.326706	7/16/2013
17	SUSMP	Infiltration	Infiltration System	927 W Manchester Blvd	33.960619	-118.372944	9/26/3013
18	SUSMP	Source Control	Inlet Filter	927 W Manchester Blvd	33.960619	-118.372944	9/26/3013
19	SUSMP	Source Control	Sump Area	927 W Manchester Blvd	33.960619	-118.372944	9/26/3013
20	SUSMP	Unknown		1050 S Prairie Ave	33.949536	-118.340478	
21	SUSMP	Unknown		317 S La Brea Ave	33.959569	-118.353519	
22	SUSMP	Unknown		3405 W Imperial Hwy	33.931094	-118.3321	
23	SUSMP	Infiltration	Infiltration System	555 E Hardty St	33.950825	-118.348367	4/24/2012
24	SUSMP	Source Control	6 Flogard Plus C.B. Inserts	555 E Hardty St	33.950825	-118.348367	4/24/2012
25	SUSMP	Green Infrastructure	Dry Well	335 S Glasgow Ave	33.958922	-118.371544	4/25/2012
26	SUSMP		Cudo SW Tank	335 S Glasgow Ave	33.958922	-118.371544	4/25/2012
27	SUSMP		Detention Area	335 S Glasgow Ave	33.958922	-118.371544	4/25/2012
28	SUSMP	Source Control	Trash Enclosure	335 S Glasgow Ave	33.958922	-118.371544	4/25/2012
29	SUSMP	Source control	Filters	740 Centinela Ave	33.9757	-118.352183	5/14/2012
30	SUSMP	Green Infrastructure	Landscape	740 Centinela Ave	33.9757	-118.352183	5/14/2012
31	SUSMP	Source Control	Trash Enclosure	740 Centinela Ave	33.9757	-118.352183	5/14/2012
32	SUSMP	Infiltration	Infiltration System	225 N La Brea Ave	33.965794	-118.353778	1/30/2013
33	SUSMP	Source Control	Filters	225 N La Brea Ave	33.965794	-118.353778	1/30/2013
34	SUSMP	Source Control	Sump Pump	225 N La Brea Ave	33.965794	-118.353778	1/30/2013
35	SUSMP	Source Control	Trash Enclosure	225 N La Brea Ave	33.965794	-118.353778	1/30/2013
36	SUSMP	Infiltration	Infiltration System	8831 Aviation Blvd	33.956392	-118.378289	12/13/2012
37	SUSMP	Green Infrastructure	Bioswales	8831 Aviation Blvd	33.956392	-118.378289	12/13/2012
38	SUSMP	Source Control	Inlet Filters	8831 Aviation Blvd	33.956392	-118.378289	12/13/2012
39	SUSMP	Source Control	Wastewater Interceptor w/ Sump Pump	427 S Hindry Ave	33.957681	-118.373778	6/14/2011
40	SUSMP	Source Control	Grease Interceptor	424 S Isis Ave	33.957778	-118.375536	7/21/2011
41	SUSMP	Source Control	Trash Enclosure	424 S Isis Ave	33.957778	-118.375536	7/21/2011
42	SUSMP	Green Infrastructure	Dry Well	527 Regent St	33.964778	-118.365394	8/23/2011
43	SUSMP	Source Control	Grease Interceptor	675 S La Brea Ave	33.9556	-118.352564	12/13/2011
44	SUSMP	Source Control	Trash Enclosure	675 S La Brea Ave	33.9556	-118.352564	12/13/2011
45	SUSMP	Source Control	Grease Interceptor	1100 W Florence Ave	33.960839	-118.375539	2/4/2010
46	SUSMP	Source Control	Trash Enclosure	1100 W Florence Ave	33.960839	-118.375539	2/4/2010
47	SUSMP	Infiltration	Vegetated Swale	670 W Arbor Vitae St	33.952408	-118.367669	6/29/2010
48	SUSMP	Infiltration	Infiltration System	670 W Arbor Vitae St	33.952408	-118.367669	6/29/2010
49	SUSMP	Infiltration	Infiltration System with Filters	151 N Locust St	33.963792	-118.350808	11/3/2010
50	SUSMP	Source Control	Grease Interceptor	621 W Manchester Blvd	33.961797	-118.367297	10/21/2010
51	SUSMP	Source Control	Trash Enclosure	621 W Manchester Blvd	33.961797	-118.367297	10/21/2010

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG

ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
52	SUSMP	Institutional	Storm Drain Stencils	621 W Manchester Blvd	33.961797	-118.367297	10/21/2010
53	SUSMP	Source Control	Grease Interceptor	2323 W Manchester Blvd	33.960164	-118.319478	11/23/2010
54	SUSMP	Source Control	Trash Enclosure	2323 W Manchester Blvd	33.960164	-118.319478	11/23/2010
55	SUSMP	Source Control	Drain Filters	619 S Prairie Ave	33.955778	-118.344169	2/2/2009
56	SUSMP	Source Control	Trash Enclosure	619 S Prairie Ave	33.955778	-118.344169	2/2/2009
57	SUSMP			527 W Regent St	33.964831	-118.3654	
58	SUSMP	Detention	Detention System	701 Grace Ave	33.968622	-118.345239	4/17/2009
59	SUSMP	Institutional	Storm Drain Stencils	701 Grace Ave	33.968622	-118.345239	4/17/2009
60	SUSMP	Source Control	Filter	610 N Eucalyptus Ave	33.970386	-118.358778	8/3/2009
61	SUSMP	Institutional	Storm Drain Stencils	610 N Eucalyptus Ave	33.970386	-118.358778	8/3/2009
62	SUSMP	Source Control	Trash Enclosure	610 N Eucalyptus Ave	33.970386	-118.358778	8/3/2009
63	SUSMP	Source Control	Grease Interceptor	3236 W Manchester Blvd	33.959697	-118.328539	10/2/2009
64	SUSMP	Source Control	Trash Enclosure	3236 W Manchester Blvd	33.959697	-118.328539	10/2/2009
65	SUSMP	Institutional	Storm Drain Stencils	3236 W Manchester Blvd	33.959697	-118.328539	10/2/2009
66	SUSMP	Green Infrastructure	Retention System	447 N Prairie Ave	33.970272	-118.344367	10/7/2009
67	SUSMP	Source Control	Trash Enclosure	447 N Prairie Ave	33.970272	-118.344367	10/7/2009
68	SUSMP	Institutional	Storm Drain Stencils	447 N Prairie Ave	33.970272	-118.344367	10/7/2009
69	SUSMP	Source Control	Grease Interceptor	315 S Market St	33.959892	-118.352172	12/21/2009
70	SUSMP	Institutional	Storm Drain Stencils	315 S Market St	33.959892	-118.352172	12/21/2009
71	SUSMP	Infiltration	Infiltration System	733 S Hindry Ave	33.953461	-118.374311	4/8/2010
72	SUSMP	Source Control	Filters	733 S Hindry Ave	33.953461	-118.374311	4/8/2010
73	SUSMP	Source Control	Trash Enclosure	733 S Hindry Ave	33.953461	-118.374311	4/8/2010
74	SUSMP	Institutional	Storm Drain Stencils	733 S Hindry Ave	33.953461	-118.374311	4/8/2010
75	SUSMP	Source Control	Grease Interceptor	4656 W Century Blvd	33.945667	-118.358897	12/31/2009
76	SUSMP	Institutional	Storm Drain Stencils	4656 W Century Blvd	33.945667	-118.358897	12/31/2009
77	SUSMP	Green Infrastructure	Dry Well	812 S Osage Ave	33.953444	-118.345322	8/22/2008
78	SUSMP	Source Control	Filters	812 S Osage Ave	33.953444	-118.345322	8/22/2008
79	SUSMP	Source Control	Trash Enclosure	812 S Osage Ave	33.953444	-118.345322	8/22/2008
80	SUSMP		Sump Pump	812 S Osage Ave	33.953444	-118.345322	8/22/2008
81	SUSMP	Source Control	Grease Interceptor	3949 W 111th St	33.93485	-118.343428	9/23/2008
82	SUSMP	Source Control	Inlet Filters	3949 W 111th St	33.93485	-118.343428	9/23/2008
83	SUSMP	Source Control	Trash Enclosure	3949 W 111th St	33.93485	-118.343428	9/23/2008
84	SUSMP	Source Control	Grease Interceptor	739 E Hyde Park Blvd	33.977461	-118.344758	10/9/2008
85	SUSMP	Source Control	Inlet Filters	739 E Hyde Park Blvd	33.977461	-118.344758	10/9/2008
86	SUSMP	Source Control	Trash Enclosure	739 E Hyde Park Blvd	33.977461	-118.344758	10/9/2008
87	SUSMP	Green Infrastructure	Retention System	546 W Olive St	33.960872	-118.365825	2/14/2007
88	SUSMP	Source Control	Inlet Filters	546 W Olive St	33.960872	-118.365825	2/14/2007
89	SUSMP	Source Control	Trash Enclosure	546 W Olive St	33.960872	-118.365825	2/14/2007
90	SUSMP	Green Infrastructure	Retention System	1300 Centinela Ave	33.976767	-118.361761	3/8/2007
91	SUSMP	Source Control	Inlet Filters	1300 Centinela Ave	33.976767	-118.361761	3/8/2007
92	SUSMP	Source Control	Trash Enclosure	1300 Centinela Ave	33.976767	-118.361761	3/8/2007
93	SUSMP	Green Infrastructure	Retention System	3945-3947 W Imperial Hwy	33.931147	-118.343444	3/23/2007
94	SUSMP	Source Control	Inlet Filters	3945-3947 W Imperial Hwy	33.931147	-118.343444	3/23/2007
95	SUSMP	Source Control	Trash Enclosure	3945-3947 W Imperial Hwy	33.931147	-118.343444	3/23/2007
96	SUSMP	Source control	Bioclean Hydrocarbon Filter	1114 Centinela Ave	33.9765	-118.358247	5/2/2007
97	SUSMP	Detention	Detention System w/ Sump Pump	303 W Manchester Blvd	33.961875	-118.359922	7/19/2007
98	SUSMP	Source Control	Trash Enclosure	303 W Manchester Blvd	33.961875	-118.359922	7/19/2007
99	SUSMP	Source control	Secondary Containment w/ Overhead Cover	1050 S Prairie Ave	33.949939	-118.340517	7/26/2007
100	SUSMP	Unknown		11222 S Crenshaw Blvd	33.932717	-118.326283	
101	SUSMP	Source control	Trash Enclosure	2717 W Manchester Blvd	33.960214	-118.323703	9/13/2007
102	SUSMP	Green Infrastructure	Retention System	3150-3188 W Imperial Hwy	33.93035	-118.327397	9/25/2007
103	SUSMP	Source Control	Inlet Filters	3150-3188 W Imperial Hwy	33.93035	-118.327397	9/25/2007
104	SUSMP	Source Control	Trash Enclosure	3150-3188 W Imperial Hwy	33.93035	-118.327397	9/25/2007
105	SUSMP	Infiltration	Infiltration System	109 E Arbor Vitae St	33.953036	-118.354383	12/12/2007
106	SUSMP	Source Control	Inlet Filters	109 E Arbor Vitae St	33.953036	-118.354383	12/12/2007
107	SUSMP	Source Control	Trash Enclosure	109 E Arbor Vitae St	33.953036	-118.354383	12/12/2007
108	SUSMP	Detention	Detention System	830 N Acacia St	33.973761	-118.363428	12/7/2007
109	SUSMP	Source Control	Inlet Filter	830 N Acacia St	33.973761	-118.363428	12/7/2007
110	SUSMP	Source control	Grease Interceptor	212 E Regent St	33.964392	-118.352539	1/2/2008
111	SUSMP	Source Control	Trash Enclosure	212 E Regent St	33.964392	-118.352539	1/2/2008
112	SUSMP	Detention	Detention System	606 Centinela Ave	33.973886	-118.350267	12/21/2007

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
113	SUSMP	Source Control	Trench Drain with Filter	606 Centinela Ave	33.973886	-118.350267	12/21/2007
Lomita							
1	SUSMP	Source Control	Catch basin and trench drain filter	24925 Walnut St	33.798697	-118.312091	1/3/2011
2	SUSMP	Source Control	Ultra-Draingard	1886 Lomita Blvd	33.798769	-118.311756	1/14/2008
3	SUSMP	Source Control	Catch basin and trench drain filter	25829 Narbonne Ave	33.789051	-118.320053	1/18/2006
4	SUSMP	Source Control	Kristar Swalegard	26607 S. Western Ave	33.779493	-118.309638	3/1/2010
5	SUSMP	Source Control	4 catch basin filters	2477 Lomita Blvd	33.805675	-118.327301	4/19/2011
6	SUSMP	Source Control	3 trench drain filters	25808 Narbonne Ave	33.789362	-118.319920	8/31/2009
Los Angeles (City)							
1	LID	Rain Barrel	4 Rain Barrels	5125 N North Maywood Ave	34.139953	-118.211814	9/30/2013
2	LID	Green Infrastructure	2 Planter Boxes	478 & 480 W 2nd St	33.742389	-118.287281	9/30/2013
3	LID	Permeable Pavement	Permeable Pavers	478 & 480 W 2nd St	33.742389	-118.287281	10/1/2013
4	LID	Rain Barrel	8 Rain Barrels	555 San Juan Ave	33.992931	-118.467567	9/26/2013
5	LID	Permeable Pavement	Permeable Pavers	555 San Juan Ave	33.992931	-118.467567	9/27/2013
6	LID	Green Infrastructure	3 Planter Boxes	1552 W 220th St	33.828131	-118.299531	9/25/2013
7	LID	Permeable Pavement	Permeable Pavers	1552 W 220th St	33.828131	-118.299531	9/25/2013
8	LID	Rain Barrel	8 Rain Barrels	870 E. Rose Ave	34.002417	-118.465192	9/23/2013
9	LID	Rain Barrel	6 Rain Barrels	733 1/2 E 48th St	33.999808	-118.262219	9/18/2013
10	LID	Permeable Pavement	Permeable Pavers	733 1/2 E 48th St	33.999808	-118.262219	9/18/2013
11	LID	Green Infrastructure	Dry Well	845 E Warren Ave	34.002639	-118.467353	9/17/2013
12	LID	Source Control	2 Pretreatment Settling Catch Basins	845 E Warren Ave	34.002639	-118.467353	9/17/2013
13	LID	Permeable Pavement	4 Permeable Pavers	845 E Warren Ave	34.002639	-118.467353	9/17/2013
14	LID	Green Infrastructure	3 Planter Boxes	1813 E Imperial Hwy	33.929669	-118.240378	9/17/2013
15	LID	Permeable Pavement	Permeable Paver	1813 E Imperial Hwy	33.929669	-118.240378	9/17/2013
16	LID	Rain Barrel	2 Rain Garden	1233 E Vienna Wy	34.000553	-118.454094	9/12/2013
17	LID	Permeable Pavement	2 Permeable Pavers	1233 E Vienna Wy	34.000553	-118.454094	9/12/2013
18	LID	Rain Barrel	8 Rain Barrels	881 E Warren Ave	34.003169	-118.466347	9/11/2013
19	LID	Green Infrastructure	Green Roof	881 E Warren Ave	34.003169	-118.466347	9/11/2013
20	LID	Unknown	Unknown	221 E 58th St	33.989756	-118.271028	9/10/2013
21	LID	Green Infrastructure	Planter Box	1630 N Amalfi Dr	34.060861	-118.501833	9/9/2013
22	LID	Rain Barrel	Rain Garden	1147 N Hartzell St	34.050681	-118.520947	9/4/2013
23	LID	Permeable Pavement	Permeable Paver	1147 N Hartzell St	34.050681	-118.520947	9/4/2013
24	LID	Rain Barrel	4 Rain Barrels	1041 E Nowita Pl	33.997947	-118.457425	8/29/2013
25	LID	Rain Barrel	4 Rain Barrels	3602 S Meyler St	33.714078	-118.299769	8/29/2013
26	LID	Rain Barrel	4 Rain Barrels	1242 W Maurentania St	33.789383	-118.279278	8/29/2013
27	LID	Green Infrastructure	5 Planter Boxes	1601 N San Onofre Dr	34.061919	-118.504622	8/29/2013
28	LID	Permeable Pavement	Permeable Pavers	3026 Kelton Ave	34.029114	-118.422081	8/28/2013
29	LID	Green Infrastructure	2 Planter Boxes	3026 Kelton Ave	34.029114	-118.422081	8/28/2013
30	LID	Permeable Pavement	Permeable Pavers	208 S Ruth Ave	34.000839	-118.472492	8/23/2013
31	LID	Infiltration	Infiltration Trenches	1490 W 7th St	34.053083	-118.269369	8/22/2013
32	LID	Source Control	Drain Filter	1490 W 7th St	34.053083	-118.269369	8/22/2013
33	LID	Source Control	3 Fossil Filter CB Insert	1490 W 7th St	34.053083	-118.269369	8/22/2013
34	LID	Rain Barrel	4 Rain Barrels	620 55th St	33.992439	-118.264400	8/20/2013
35	LID	Green Infrastructure	2 Dry Wells	739 E California Ave	33.994139	-118.463864	8/13/2013
36	LID	Permeable Pavement	Permeable Pavers	15460 W Albright St	34.050436	-118.527389	8/8/2013
37	LID	Green Infrastructure	Planter Box	15460 W Albright St	34.050436	-118.527389	8/8/2013
38	LID	Rain Barrel	14 Rain Barrel	211 S Pacific Ave	33.996114	-118.479061	8/5/2013
39	LID	Permeable Pavement	2 Permeable Pavers	211 S Pacific Ave	33.996114	-118.479061	8/5/2013
40	LID	Permeable Pavement	2 Permeable Pavers	1626 W 259th St	33.788161	-118.305200	8/5/2013
41	LID	Rain Barrel	2 Rain Barrels	1626 W 259th St	33.788161	-118.305200	8/5/2013
42	LID	Infiltration	Infiltration Trench	10615 Anzac Ave	33.939278	-118.237994	8/1/2013

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
43	LID	Green Infrastructure	Capture and Use	901 E E St	33.776261	-118.251764	7/30/2013
44	LID	Green Infrastructure	5 Planter Boxes	624 E Millwood Ave	33.991336	-118.463933	7/25/2013
45	LID	Permeable Pavement	Permeable Paver	624 E Millwood Ave	33.991336	-118.463933	7/25/2013
46	LID	Green Infrastructure	Vegetated Swale/Strip	19600 Magellan Dr	33.852853	-118.292347	7/24/2013
47	LID	Infiltration	Infiltration Trench	19600 Magellan Dr	33.852853	-118.292347	7/24/2013
48	LID	Green Infrastructure	3 Planter Boxes	666 Flower Ct	33.998725	-118.469344	7/11/2013
49	LID	Permeable Pavement	Permeable Paver	635 W 18th St	33.727469	-118.291000	7/11/2013
50	LID	Infiltration	Infiltration Trench	1 World Wy	33.944511	-118.398367	7/10/2013
51	LID	Rain Barrel	8 Rain Barrels	326 Brooks Ave	33.993239	-118.472331	7/10/2013
52	LID	Green Infrastructure	2 Planter Boxes	1026 W M St	33.788625	-118.275950	7/5/2013
53	LID	Rain Barrel	2 Rain Barrel	1026 W M St	33.788625	-118.275950	7/5/2013
54	LID	Green Infrastructure	Planter Box	3012 Yale Ave	33.988544	-118.448839	7/3/2013
55	LID	Green Infrastructure	8 Planter Boxes	1202 N Island Ave	33.786925	-118.266547	6/21/2013
56	LID	Permeable Pavement	2 Permeable Pavers	1202 N Island Ave	33.786925	-118.266547	6/21/2013
57	LID	Rain Barrel	Rain Garden	1334 W 221st St	33.826778	-118.300736	6/21/2013
58	LID	Unknown	Unknown	7609 S Main	33.970481	-118.274000	6/21/2013
59	LID	Green Infrastructure	2 Planter Boxes	3113 S Yale Ave	33.987653	-118.448553	6/20/2013
60	LID	Permeable Pavement	Permeable Paver	327 E 107th St	33.939433	-118.268533	6/19/2013
61	LID	Green Infrastructure	Planter Box	327 E 107th St	33.939433	-118.268533	6/19/2013
62	LID	Permeable Pavement	Permeable Paver	1664 W 223rd St	33.824411	-118.308139	6/18/2013
63	LID	Permeable Pavement	Permeable Paver	22340 S Western Ave	33.823950	-118.308800	6/18/2013
64	LID	Permeable Pavement	Porous Pavement	22340 S Western Ave	33.823950	-118.308800	6/18/2013
65	LID	Infiltration	2 Underground Detention/ Infiltration Chamber System	1501 W L ST	33.785942	-118.280578	6/17/2013
66	LID	Infiltration	Infiltration Trench	4143 Glencoe Ave	33.988636	-118.441986	6/6/2013
67	LID	Source Control	CB Trash Screens	4143 Glencoe Ave	33.988636	-118.441986	6/6/2013
68	LID	Green Infrastructure	4 Planter Boxes	1518 S Dodson Ave	33.729825	-118.311542	6/6/2013
69	LID	Infiltration	Infiltration Trench	2309 E 108th St	33.937128	-118.230761	6/6/2013
70	LID	Infiltration	Infiltration Trench	2311 E 108th St	33.937114	-118.230711	6/6/2013
71	LID	Green Infrastructure	2 Planter Boxes	1000 W. Paseo Del Mar	33.711542	-118.301500	6/5/2013
72	LID	Green Infrastructure	2 Planter Boxes	1479 Via Cresta	34.056797	-118.536878	5/29/2013
73	LID	Green Infrastructure	2 Planter Boxes	14747 W Oracle Pl	34.055664	-118.520278	5/28/2013
74	LID	Permeable Pavement	Permeable Paver	14747 W Oracle Pl	34.055664	-118.520278	5/28/2013
75	LID	Infiltration	Infiltration Trench	3306 W 71st St	33.975292	-118.329731	5/23/2013
76	LID	Green Infrastructure	Planter Box	7912 83rd St	33.960628	-118.435028	5/22/2013
77	LID	Green Infrastructure	3 Planter Boxes	615 N Bienveneda	34.047278	-118.540289	5/22/2013
78	SUSMP	Source Control	Slope Vegetation	14705 W Oracle Pl	34.055800	-118.518592	5/16/2013
79	LID	Unknown	Unknown	438 E Altair Pl	33.989686	-118.467431	5/15/2013
80	LID	Green Infrastructure	Dry Well	748 N Amalfi Dr	34.042450	-118.511114	5/13/2013
81	LID	Rain Barrel	4 Rain Barrels	1207 Averill Ave	33.733169	-118.307886	5/13/2013
82	LID	Rain Barrel	4 Rain Barrels	702 W 140th St	33.904294	-118.287372	5/7/2013
83	LID	Permeable Pavement	2 Permeable Pavers	630 W Woodlawn Ave	33.989125	-118.456850	5/6/2013
84	LID	Unknown	Unknown	560 N Western Ave	33.746753	-118.309503	5/2/2013
85	LID	Green Infrastructure	6 Planter Boxes	2337 Clement Ave	33.986389	-118.461367	5/2/2013
86	LID	Green Infrastructure	3 Planter Boxes	546 Vernon	33.996192	-118.470611	5/1/2013
87	LID	Green Infrastructure	Planter Box	10350 S Croesus Ave	33.941647	-118.233550	4/30/2013
88	LID	Rain Barrel	4 Rain Barrels	2000 N Kenilworth Ave	34.096394	-118.268417	4/30/2013
89	LID	Green Infrastructure	4 Planter Boxes	1054 Fiske St	34.048789	-118.522339	4/29/2013
90	LID	Unknown	Unknown	1242 W Maurentania St	33.789108	-118.279297	4/29/2013
91	LID	Unknown	Unknown	557 N Lucero Ave	34.046250	-118.554664	4/24/2013

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	**Data Source**	**BMP Category**	**Project Description**	**Address**	**Latitude**	**Longitude**	**Date Active**
92	LID	Unknown	Unknown	777 W 190th St	33.860208	-118.287164	4/24/2013
93	LID	Green Infrastructure	2 Planter Boxes	1680 E 108th St	33.936986	-118.230183	4/23/2013
94	LID	Permeable Pavement	Permeable Pavers	1680 E 108th St	33.936986	-118.230183	4/23/2013
95	LID	Infiltration	2 Infiltration Trenches	16300 Ainsworth St	33.883158	-118.289922	4/17/2013
96	LID	Source Control	4 Fossil Filter CB Inserts	16300 Ainsworth St	33.883158	-118.289922	4/17/2013
97	LID	Permeable Pavement	4 Planter Boxes	760 N Hartzell St	34.042917	-118.518875	4/15/2013
98	LID	Permeable Pavement	Permeable Pavers	1627 S Crescent Pl	33.990769	-118.462133	4/12/2013
99	LID	Rain Barrel	4 Rain Barrels	1627 S Crescent Pl	33.990769	-118.462133	4/12/2013
100	LID	Rain Barrel	4 Rain Barrels	550 W 40th St	33.708050	-118.289169	4/9/2013
101	LID	Green Infrastructure	2 Planter Boxes	1518 S Oakwood Ave	33.994000	-118.461308	4/9/2013
102	LID	Rain Barrel	6 Rain Barrels	1518 S Oakwood Ave	33.994000	-118.461308	4/9/2013
103	LID	Permeable Pavement	3 Permeable Pavers	1518 S Oakwood Ave	33.994000	-118.461308	4/9/2013
104	LID	Permeable Pavement	Permeable Paver	1434 W 215 St	33.833200	-118.302853	4/9/2013
105	LID	Green Infrastructure	6 Planter Boxes	249 N Bellino Dr	34.042103	-118.560300	4/3/2013
106	LID	Green Infrastructure	2 Planter Boxes	1660 W Anaheim St	33.777958	-118.288886	4/2/2013
107	LID	Rain Barrel	4 Rain Barrels	705 W Boccaccio Ave	33.990358	-118.457119	3/28/2013
108	SUSMP	Infiltration	7 Infiltration Trenches	1302 W 177th St	33.870408	-118.296017	3/27/2013
109	SUSMP	Green Infrastructure	Planter Box	1302 W 177th St	33.870408	-118.296017	3/27/2013
110	SUSMP	Source Control	7 Fossil Filter CB Inserts	1302 W 177th St	33.870408	-118.296017	3/27/2013
111	LID	Green Infrastructure	2 Planter Boxes	11241 W Lucerene	33.999533	-118.403528	3/19/2013
112	LID	Green Infrastructure	2 Planter Boxes	3300 S Kerckoff Ave	33.714017	-118.289533	3/11/2013
113	LID	Permeable Pavement	Permeable Paver	3300 S Kerckoff Ave	33.714017	-118.289533	3/11/2013
114	LID	Unknown	Unknown	445 S Ferr St	33.746042	-118.261556	3/11/2013
115	LID	Permeable Pavement	Permeable Paver	1011 W Francisco St	33.850111	-118.294558	3/4/2013
116	LID	Rain Barrel	Rain Garden	846 E 87th St	33.958950	-118.259139	2/27/2013
117	LID	Permeable Pavement	2 Permeable Pavers	211 W 109th Pl	33.936636	-118.276636	2/27/2013
118	LID	Green Infrastructure	Planter Box	211 W 109th Pl	33.936636	-118.276636	2/27/2013
119	LID	Permeable Pavement	2 Permeable Pavers	635 E Milwood Ave	33.991722	-118.464064	2/26/2013
120	LID	Green Infrastructure	2 Planter Boxes	635 E Milwood Ave	33.991722	-118.464064	2/26/2013
121	LID	Green Infrastructure	2 Planter Boxes	9410 S Compton Ave	33.951208	-118.246044	2/15/2013
122	LID	Infiltration	Infiltration Trench	16957 W Sunset Blvd	34.042244	-118.548072	2/14/2013
123	LID	Source Control	2 Pretreatment Settling Catch Basin	16957 W Sunset Blvd	34.042244	-118.548072	2/14/2013
124	LID	Green Infrastructure	2 Planter Boxes	3670 N Holboro Dr	34.117911	-118.275497	2/7/2013
125	LID	Permeable Pavement	Permeable Paver	3670 N Holboro Dr	34.117911	-118.275497	2/7/2013
126	LID	Rain Barrel	14 Rain Barrel	1628 W 255th St	33.792350	-118.305469	2/6/2013
127	LID	Permeable Pavement	Permeable Paver	1628 W 255th St	33.792350	-118.305469	2/6/2013
128	LID	Rain Barrel	8 Rain Barrel	1157 Rosalind Ave	34.025789	-118.212833	2/6/2013
129	LID	Green Infrastructure	3 Planter Boxes	3130 N Verdugo Rd	34.107411	-118.237681	2/6/2013
130	LID	Green Infrastructure	3 Planter Boxes	532 W Imperial Hwy	33.930542	-118.283956	2/5/2013
131	LID	Rain Barrel	4 Rain Barrels	476 W Santa Cruz St	33.744231	-118.287300	2/4/2013
132	LID	Rain Barrel	2 Rain Garden	5744 N Allott Ave	34.175117	-118.427653	2/1/2013
133	LID	Permeable Pavement	Permeable Paver	5937 S Madden Ave	33.986036	-118.325583	1/31/2013
134	LID	Rain Barrel	8 Rain Barrel	5937 S Madden Ave	33.986036	-118.325583	1/31/2013
135	LID	Permeable Pavement	Permeable Paver	314 E 76th St	33.971017	-118.268933	1/24/2013
136	LID	Green Infrastructure	Planter Box	314 E 76th St	33.971017	-118.268933	1/24/2013
137	LID	Unknown	Unknown	452 W Carroll Cl	33.986092	-118.464597	1/23/2013
138	LID	Green Infrastructure	2 Planter Boxes	935 W 60th St	33.985603	-118.290500	1/9/2013
139	LID	Unknown	Unknown	25706 S Belle Porte Ave	33.790772	-118.300847	1/9/2013
140	LID	Rain Barrel	4 Rain Barrels	14707 W Sunset Blvd	34.041472	-118.518275	1/2/2013
141	LID	Rain Barrel	4 Rain Barrels	861 W 124th St	33.920253	-118.291664	12/27/2012
142	LID	Rain Barrel	Rain Garden	861 W 124th St	33.920253	-118.291664	12/27/2012

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	**Data Source**	**BMP Category**	**Project Description**	**Address**	**Latitude**	**Longitude**	**Date Active**
143	LID	Green Infrastructure	3 Planter Boxes	1178 W 20th St	33.725972	-118.303039	12/26/2012
144	LID	Green Infrastructure	2 Planter Boxes	1127 W 15th St	33.730319	-118.301825	12/14/2012
145	LID	Green Infrastructure	Planter Box	398 Alma Real Dr	34.035514	-118.522500	12/13/2012
146	LID	Green Infrastructure	Cistern	520 N Swarthmore Ave	34.038764	-118.528050	12/7/2012
147	SUSMP	Source Control	4 Katchall Kleerstream Vaults	960 W Harry Bridges Blvd	33.770489	-118.272983	11/28/2012
148	SUSMP	Source Control	11 Sand Filter	960 W Harry Bridges Blvd	33.770489	-118.272983	11/28/2012
149	SUSMP	Unknown	Unknown	637 N Sanford Ave	33.777589	-118.250525	11/1/2012
150	LID	Infiltration	Underground Detention/ Infiltration Chamber System	625 E Anaheim St	33.781175	-118.255381	10/23/2012
151	LID	Infiltration	Underground Detention/ Infiltration Chamber System	1305 W Sepulveda Blvd	33.813303	-118.298450	10/9/2012
152	LID	Source Control	CDS	1305 W Sepulveda Blvd	33.813303	-118.298450	10/9/2012
153	LID	Infiltration	Infiltration Trench	710 N Front St	33.751097	-118.282389	10/9/2012
154	SUSMP	Source Control	10 Abtech Ultra Urban CB Inserts	710 N Front St	33.751097	-118.282389	10/9/2012
155	LID	Unknown	Unknown	1327 W Silvius Ave	33.715419	-118.307136	10/3/2012
156	LID	Unknown	Unknown	909 E Colon St	33.792458	-118.252150	9/5/2012
157	LID	Permeable Pavement	3 Permeable Pavers	10314 S Lou-Dillon Ave	33.942553	-118.234558	8/31/2012
158	SUSMP	Source Control	5 Hydrodynamic Separators	600 S Sampson Wy	33.738708	-118.279025	8/31/2012
159	SUSMP	Source Control	2 CB Inserts	600 S Sampson Wy	33.738708	-118.279025	8/31/2012
160	SUSMP	Infiltration	2 Infiltration Trenches	600 S Sampson Wy	33.738708	-118.279025	8/31/2012
161	LID	Green Infrastructure	Planter Box	8741 Dalton Ave	33.957644	-118.303850	8/24/2012
162	LID	Rain Barrel	Rain Garden	1515 219th St	33.828997	-118.304489	8/13/2012
163	LID	Permeable Pavement	Permeable Paver	1515 219th St	33.828997	-118.304489	8/13/2012
164	LID	Green Infrastructure	2 Planter Boxes	1942 W 1st St	33.742994	-118.318428	8/9/2012
165	SUSMP	Green Infrastructure	Planter Box	630 W Harry Bridges Blvd	33.770700	-118.268633	7/12/2012
166	SUSMP	Source Control	Bioretention Facility	630 W Harry Bridges Blvd	33.770700	-118.268633	7/12/2012
167	SUSMP	Source Control	Abtech Ultra Urban CB Inserts	630 W Harry Bridges Blvd	33.770700	-118.268633	7/12/2012
168	SUSMP	Source Control	Slope Vegetation	3127 S Alma St	33.717275	-118.299717	5/31/2012
169	Site Specific	Unknown	Unknown	470 E Swinford St	33.749642	-118.278483	5/21/2012
170	SUSMP	Green Infrastructure	6 Planter Boxes	19310 S Pacific Gateway Dr	33.855575	-118.293978	5/10/2012
171	SUSMP	Permeable Pavement	2 Porous Pavements	19310 S Pacific Gateway Dr	33.855575	-118.293978	5/10/2012
172	SUSMP	Source Control	5 Fossil Filter CB Inserts	19310 S Pacific Gateway Dr	33.855575	-118.293978	5/10/2012
173	SUSMP	Infiltration	Infiltration Trench	1351 W Sepulveda Blvd	33.815675	-118.301436	3/28/2012
174	SUSMP	Source Control	Fossil Filter CB Insert	1351 W Sepulveda Blvd	33.815675	-118.301436	3/28/2012
175	SUSMP	Unknown	Unknown	7916 W 83rd St	33.960358	-118.435194	2/28/2012
176	SUSMP	Unknown	Unknown	1600 W Palos Verdes Dr	33.777931	-118.304961	2/23/2012
177	SUSMP	Unknown	Unknown	1112 N Via La Paz	33.755661	-118.299256	2/15/2012
178	Site Specific	Unknown	Unknown	120 W C St	33.772594	-118.262592	1/23/2012
179	SUSMP	Green Infrastructure	2 Planter Boxes	124 N Udine Wy	34.078103	-118.443711	1/12/2012
180	Site Specific	Unknown	Unknown	1451 W Knox St	33.854139	-118.301111	1/9/2012
181	SUSMP	Green Infrastructure	Green Roof	1406 Kenter Ave	34.080819	-118.492356	12/15/2011
182	SUSMP	Green Infrastructure	2 Planter Boxes	1406 Kenter Ave	34.080819	-118.492356	12/15/2011
183	SUSMP	Source Control	Vortechnics	710 N Front St	33.751069	-118.282369	11/30/2011
184	SUSMP	Source Control	2 Katchall Kleerstream Trench Filter	710 N Front St	33.751069	-118.282369	11/30/2011
185	SUSMP	Unknown	Unknown	401 E M St	33.789039	-118.258631	11/17/2011
186	SUSMP	Infiltration	Infiltration Basin	1305 N Gaffey St	33.755733	-118.292314	11/8/2011
187	SUSMP	Unknown	Unknown	1211 N Avalon Bl	33.786997	-118.262992	10/26/2011
188	SUSMP	Unknown	Unknown	1811 N Micheltorena	34.093317	-118.272269	9/8/2011
189	SUSMP	Unknown	Unknown	14931 Bestor Blvd	34.051692	-118.522956	9/7/2011
190	SUSMP	Source Control	3 Katchall Kleerstream Vaults	705 N. Henry Ford Ave	33.778567	-118.243422	9/1/2011
191	SUSMP	Green Infrastructure	3 Planter Boxes	300 E Water St	33.766542	-118.259847	9/1/2011
192	SUSMP	Source Control	2 CDS	530 W Harry Bridges Blvd	33.770797	-118.267389	8/19/2011
193	SUSMP	Source Control	32 Fossil Filter CB Inserts	530 W Harry Bridges Blvd	33.770797	-118.267389	8/19/2011
194	SUSMP	Unknown	Unknown	100 S Barrington Pl	34.065697	-118.468961	8/18/2011

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	**Data Source**	**BMP Category**	**Project Description**	**Address**	**Latitude**	**Longitude**	**Date Active**
195	SUSMP	Green Infrastructure	Planter Box	200 W. Manchester Ave	33.959553	-118.276258	8/4/2011
196	SUSMP	Source Control	Fossil Filter CB Insert	200 W. Manchester Ave	33.959553	-118.276258	8/4/2011
197	SUSMP	Green Infrastructure	3 Vegetated Swale/Strips	20000 S. Western Ave	33.851003	-118.308806	8/4/2011
198	SUSMP	Source Control	Sand Filter	20000 S. Western Ave	33.851003	-118.308806	8/4/2011
199	SUSMP	Green Infrastructure	Bioretention Facility	1603 W 25th St	33.723003	-118.313536	7/25/2011
200	SUSMP	Unknown	Unknown	2100 E Pacific Cost Hwy	33.789075	-118.235250	7/21/2011
201	SUSMP	Unknown	Unknown	100 N Avalon	33.769781	-118.261306	7/5/2011
202	SUSMP	Green Infrastructure	2 Vegetated Swale/Strips	705 N Henry Ford Ave	33.778550	-118.243342	6/16/2011
203	SUSMP	Unknown	Unknown	3100 N Gaffey St	33.776328	-118.296131	5/24/2011
204	SUSMP	Unknown	Unknown	3000 N Gaffey St	33.775378	-118.296042	5/24/2011
205	SUSMP	Unknown	Unknown	1601 N Wilmington Blvd	33.795136	-118.275442	5/9/2011
206	SUSMP	Green Infrastructure	2 Planter Boxes	1651 N Belair Rd	34.100703	-118.446883	4/25/2011
207	SUSMP	Green Infrastructure	Vegetated Swale/Strip	1651 N Belair Rd	34.100703	-118.446883	4/25/2011
208	SUSMP	Unknown	Unknown	1120 N. Wilmington Blvd	33.784908	-118.274475	4/19/2011
209	Site Specific	Unknown	Unknown	621 W 152nd St	33.894664	-118.286994	4/14/2011
210	SUSMP	Unknown	Unknown	6000 W Santa Monica	34.088089	-118.316706	4/7/2011
211	SUSMP	Green Infrastructure	2 Vegetated Swale/Strips	840 W 149th St	33.896292	-118.289917	3/22/2011
212	SUSMP	Infiltration	Infiltration Trench	840 W 149th St	33.896292	-118.289917	3/22/2011
213	SUSMP	Permeable Pavement	Porous Pavement	840 W 149th St	33.896292	-118.289917	3/22/2011
214	SUSMP	Green Infrastructure	Planter Box	964 Hilgard Ave	34.061947	-118.441242	2/16/2011
215	SUSMP	Unknown	Unknown	1602 W 25th St	33.723406	-118.312531	2/3/2011
216	SUSMP	Unknown	Unknown	6517 S Vista Del Mar	33.961533	-118.449919	1/4/2011
217	SUSMP	Source Control	Slope Vegetation	8451 W Hillside Ave	34.100519	-118.372603	12/30/2010
218	SUSMP	Unknown	Unknown	557 N Lucero Ave	34.046172	-118.554708	12/28/2010
219	SUSMP	Unknown	Unknown	701 N San Lorenzo St	34.037833	-118.509992	12/20/2010
220	SUSMP	Infiltration	3 Underground Detention/ Infiltration Chamber System	1521 W Francisco St	33.849281	-118.305842	12/10/2010
221	SUSMP	Source Control	13 Fossil Filter CB Insert	1521 W Francisco St	33.849281	-118.305842	12/10/2010
222	SUSMP	Green Infrastructure	3 Vegetated Swale/Strips	18320 S Western Ave	33.863614	-118.308608	11/12/2010
223	SUSMP	Green Infrastructure	29 Planter Box	25825 S Vermont Ave	33.788417	-118.295683	11/4/2010
224	SUSMP	Source Control	7 Fossil Filter CB Insert	25825 S Vermont Ave	33.788417	-118.295683	11/4/2010
225	SUSMP	Unknown	Unknown	556 W 9th St	33.736161	-118.288914	11/2/2010
226	SUSMP	Unknown	Unknown	2500 S Signal St	33.721503	-118.272839	9/13/2010
227	SUSMP	Unknown	Unknown	631 N Haverford Ave	34.041733	-118.529772	8/20/2010
228	SUSMP	Green Infrastructure	4 Planter Boxes	15323 Whitfield Ave	34.051967	-118.526425	8/20/2010
229	SUSMP	Source Control	2 Fossil Filter CB Insert	15323 Whitfield Ave	34.051967	-118.526425	8/20/2010
230	SUSMP	Green Infrastructure	Planter Box	25621 Normandie Ave	33.784439	-118.298042	8/5/2010
231	SUSMP	Unknown	Unknown	2209 E I St	33.783036	-118.234250	7/28/2010
232	SUSMP	Unknown	Unknown	2100 E Pacific Coast Hwy	33.791514	-118.232881	5/17/2010
233	SUSMP	Infiltration	Underground Detention/ Infiltration Chamber System	201 N Palos Verdes St	33.741903	-118.281531	5/7/2010
234	SUSMP	Green Infrastructure	Dry Well	201 N Palos Verdes St	33.741903	-118.281531	5/7/2010
235	SUSMP	Green Infrastructure	2 Planter Boxes	10704 Wilmington	33.938642	-118.239014	4/28/2010
236	SUSMP/OWTS	Unknown	Unknown	1500 W Francisco St	33.848450	-118.304022	4/22/2010
237	SUSMP	Unknown	Unknown	545 S Fries Ave	33.765022	-118.264103	4/1/2010
238	SUSMP	Green Infrastructure	Planter Box	1600 Palos Verdes Dr	33.777872	-118.304936	3/23/2010
239	SUSMP	Source Control	6 Fossil Filter CB Insert	1327 W 228th St	33.819139	-118.300458	3/18/2010
240	Site Specific	Unknown	Unknown	1660 W. Anaheim St	33.777889	-118.288883	1/14/2010
241	SUSMP	Unknown	Unknown	6209 Ocean Front Walk	33.961839	-118.453528	1/12/2010
242	SUSMP	Infiltration	Underground Detention/ Infiltration Chamber System	410 N Hawaiian	33.773700	-118.275661	12/18/2009
243	SUSMP	Source Control	2 Contech CB Inserts	410 N Hawaiian	33.773700	-118.275661	12/18/2009
244	SUSMP	Source Control	Fossil Filter CB Insert	1425 West Carson St	33.830950	-118.356942	11/20/2009
245	SUSMP	Source Control	3 Fossil Filter CB Insert	14221 S Figueroa St	33.902075	-118.283208	11/19/2009
246	SUSMP	Green Infrastructure	Bioretention Facility	14221 S Figueroa St	33.902075	-118.283208	11/19/2009
247	SUSMP	Source Control	Fossil Filter CB Insert	428 E G St	33.778642	-118.257533	11/12/2009
248	SUSMP	Green Infrastructure	21 Bioretention Facilities	25821 S Vermont Ave	33.789178	-118.293914	11/3/2009

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG

ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
249	SUSMP	Green Infrastructure	6 Planter Boxes	25821 S Vermont Ave	33.789178	-118.293914	11/3/2009
250	Site Specific	Unknown	Unknown	799 S Seaside Ave	33.728772	-118.268719	11/3/2009
251	SUSMP	Unknown	Unknown	3525 S Kerckoff Ave	33.711967	-118.289842	10/20/2009
252	SUSMP	Unknown	Unknown	1138 N Las Pulgas	34.053475	-118.539883	9/22/2009
253	SUSMP	Source Control	Slope Vegetation	1426 W 37th St	33.715589	-118.309219	7/7/2009
254	SUSMP	Infiltration	2 Infiltration Trenches	710 N Front St	33.749144	-118.280722	5/28/2009
255	SUSMP	Source Control	Vortechnics	710 N Front St	33.749144	-118.280722	5/28/2009
256	SUSMP	Source Control	6 Abtech Ultra Urban CB Inserts	710 N Front St	33.749144	-118.280722	5/28/2009
257	SUSMP	Unknown	Unknown	3411 S Carolina St	33.713014	-118.290728	5/28/2009
258	SUSMP	Source Control	Sedimentation Basin	401 N Henry Ford Ave	33.773403	-118.241156	5/15/2009
259	SUSMP	Source Control	Vortechnics	920 W Harry Bridges Blvd	33.769942	-118.278692	5/7/2009
260	SUSMP	Source Control	10 Abtech Ultra Urban CB Inserts	920 W Harry Bridges Blvd	33.769942	-118.278692	5/7/2009
261	SUSMP	Infiltration	Infiltration Trench	920 W Harry Bridges Blvd	33.769942	-118.278692	5/7/2009
262	Site Specific	Unknown	Unknown	1660 W Anaheim St	33.776636	-118.288764	4/24/2009
263	SUSMP	Green Infrastructure	2 Bioretention Facilities	1000 W Pacific Coast Hwy	33.790256	-118.275197	2/25/2009
264	SUSMP	Green Infrastructure	2 Vegetated Swale/Strips	1000 W Pacific Coast Hwy	33.790256	-118.275197	2/25/2009
265	SUSMP	Permeable Pavement	Porous Pavement	1000 W Pacific Coast Hwy	33.790256	-118.275197	2/25/2009
266	SUSMP	Infiltration	15 Infiltration Trenches	2235 Miner St	33.725356	-118.278206	2/25/2009
267	SUSMP	Source Control	3 CDS	2235 Miner St	33.725356	-118.278206	2/25/2009
268	SUSMP	Source Control	4 Stormfilter	2235 Miner St	33.725356	-118.278206	2/25/2009
269	SUSMP	Unknown	Unknown	1019 W M St	33.788606	-118.275756	2/17/2009
270	SUSMP	Unknown	Unknown	1412 N Wilmington Blvd	33.791031	-118.274744	2/13/2009
271	SUSMP	Green Infrastructure	17 StormTech Chamber Systems	25020 Doble Ave	33.796975	-118.291511	2/13/2009
272	SUSMP	Unknown	Unknown	3525 Mulldae Ave	33.720811	-118.321417	2/6/2009
273	SUSMP	Green Infrastructure	Planter Box	5610 York Blvd	34.119306	-118.196408	2/3/2009
274	SUSMP	Green Infrastructure	6 Vegetated Swale/Strips	5610 York Blvd	34.119306	-118.196408	2/3/2009
275	SUSMP	Unknown	Unknown	1215 W Grant St	33.783175	-118.278606	2/2/2009
276	SUSMP	Green Infrastructure	13 StormTech Chamber Systems	1608 W Pacific Coast Hwy	33.789342	-118.304608	1/30/2009
277	SUSMP	Source Control	Drain Pac CB Insert	1608 W Pacific Coast Hwy	33.789342	-118.304608	1/30/2009
278	SUSMP	Source Control	Fossil Filter CB Insert	1608 W Pacific Coast Hwy	33.789342	-118.304608	1/30/2009
279	SUSMP	Unknown	Unknown	500 S Pacific Ave	33.739361	-118.287794	1/13/2009
280	SUSMP	Source Control	Fossil Filter CB Insert	1420 N Coil Ave	33.793053	-118.242803	1/13/2009
281	SUSMP	Infiltration	Infiltration Trench	1420 N Coil Ave	33.793053	-118.242803	1/13/2009
282	SUSMP	Green Infrastructure	StormTech Chamber System	13414 S Figueroa St	33.909933	-118.282633	1/7/2009
283	SUSMP	Source Control	Fossil Filter CB Insert	13414 S Figueroa St	33.909933	-118.282633	1/7/2009
284	SUSMP	Green Infrastructure	Planter Box	1663 E Anaheim St	33.781094	-118.241219	12/2/2008
285	SUSMP	Green Infrastructure	Planter Box	403 E Harry Bridges Blvd	33.771394	-118.257922	11/18/2008
286	SUSMP	Unknown	Unknown	751 Eldridge St	33.747031	-118.261061	11/3/2008
287	SUSMP	Green Infrastructure	2 Planter Boxes	730 N Watson Ave	33.780006	-118.246650	10/30/2008
288	SUSMP	Green Infrastructure	Vegetated Swale/Strip	323 Lecouvreur Ave	33.773375	-118.255536	10/14/2008
289	SUSMP	Green Infrastructure	2 Planter Boxes	1625 S Granville Ave	34.040750	-118.456692	10/6/2008
290	SUSMP	Source Control	Fossil Filter CB Insert	1625 S Granville Ave	34.040750	-118.456692	10/6/2008
291	SUSMP	Unknown	Unknown	18054 W Sandy Cape Dr	34.047611	-118.569014	9/25/2008
292	SUSMP	Unknown	Unknown	1140 N Monument St	34.049847	-118.524606	9/15/2008
293	SUSMP	Green Infrastructure	Vegetated Swale/Strip	421 N Henry Ford Ave	33.773861	-118.241200	8/29/2008
294	SUSMP	Permeable Pavement	Porous Pavement	421 N Henry Ford Ave	33.773861	-118.241200	8/29/2008
295	SUSMP	Green Infrastructure	2 Planter Boxes	12015 S Figueroa St	33.922947	-118.282881	8/28/2008
296	SUSMP	Source Control	3 Fossil Filter CB Inserts	12015 S Figueroa St	33.922947	-118.282881	8/28/2008
297	SUSMP	Source Control	Drain Pac CB Inserts	12015 S Figueroa St	33.922947	-118.282881	8/28/2008
298	SUSMP	Unknown	Unknown	601 N Henry Ford Ave	33.768433	-118.240439	8/27/2008
299	SUSMP	Green Infrastructure	Slope Vegetation	601 N Henry Ford Ave	33.768433	-118.240439	8/19/2008
300	SUSMP	Unknown	Unknown	6834 W Quinton Ln	34.248094	-118.280686	8/18/2008
251	SUSMP	Unknown	Unknown	3525 S Kerckoff Ave	33.711967	-118.289842	10/20/2009
252	SUSMP	Unknown	Unknown	1138 N Las Pulgas	34.053475	-118.539883	9/22/2009
253	SUSMP	Source Control	Slope Vegetation	1426 W 37th St	33.715589	-118.309219	7/7/2009
254	SUSMP	Infiltration	2 Infiltration Trenches	710 N Front St	33.749144	-118.280722	5/28/2009
255	SUSMP	Source Control	Vortechnics	710 N Front St	33.749144	-118.280722	5/28/2009

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG

ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
256	SUSMP	Source Control	6 Abtech Ultra Urban CB Inserts	710 N Front St	33.749144	-118.280722	5/28/2009
257	SUSMP	Unknown	Unknown	3411 S Carolina St	33.713014	-118.290728	5/28/2009
258	SUSMP	Source Control	Sedimentation Basin	401 N Henry Ford Ave	33.773403	-118.241156	5/15/2009
259	SUSMP	Source Control	Vortechnics	920 W Harry Bridges Blvd	33.769942	-118.278692	5/7/2009
300	SUSMP	Unknown	Unknown	6834 W Quinton Lane	34.248094	-118.280686	8/18/2008
301	SUSMP	Green Infrastructure	3 Vegetated Swale/Strip	522 N Flint Ave	33.777003	-118.249086	8/8/2008
302	SUSMP	Green Infrastructure	3 Vegetated Swale/Strip	18320 S Western Ave	33.863817	-118.308556	7/25/2008
303	SUSMP	Unknown	Unknown	602 N Flint Ave	33.777589	-118.249164	6/17/2008
304	SUSMP	Source Control	2 Fossil Filter CB Insert	618 N Pioneer Ave	33.779106	-118.248003	6/17/2008
305	SUSMP	Green Infrastructure	2 Vegetated Swale/Strip	618 N Pioneer Ave	33.779106	-118.248003	6/17/2008
306	SUSMP	Unknown	Unknown	1553 W 205th St	33.844850	-118.306011	6/12/2008
307	SUSMP	Green Infrastructure	Vegetated Swale/Strip	1355 N Broad Ave	33.779906	-118.261075	6/3/2008
308	SUSMP	Permeable Pavement	Porous Pavement	1355 N Broad Ave	33.779906	-118.261075	6/3/2008
309	SUSMP	Unknown	Unknown	1662 W Pacific Coast Hwy	33.790842	-118.286894	5/27/2008
310	SUSMP	Green Infrastructure	Vegetated Swale/Strip	238 N Trotwood Ave	33.745294	-118.317017	4/24/2008
311	SUSMP	Unknown	Unknown	3427 S Mentone Ave	34.026344	-118.410364	4/18/2008
312	SUSMP	Green Infrastructure	Planter Box	15007 W Bestor Blvd	34.051578	-118.523483	4/7/2008
313	SUSMP	Source Control	CDS	240 W Venice Blvd	34.034961	-118.266081	4/7/2008
314	SUSMP	Unknown	Unknown	210 E 22nd St	33.725678	-118.279961	3/17/2008
315	SUSMP	Unknown	Unknown	550 S Sampson Way	33.740350	-118.278919	3/17/2008
316	SUSMP	Unknown	Unknown	1320 W Mauretania St	33.790131	-118.280425	2/5/2008
317	SUSMP	Unknown	Unknown	255 W 8th St	33.736822	-118.282614	2/1/2008
318	SUSMP	Source Control	2 Fossil Filter CB Insert	536 N Banning Blvd	33.776794	-118.256636	1/30/2008
319	SUSMP	Infiltration	4 Infiltration Trenches	536 N Banning Blvd	33.776794	-118.256636	1/30/2008
320	Site Specific	Unknown	Unknown	1660 W Anaheim St	33.776689	-118.288717	1/9/2008
321	SUSMP	Unknown	Unknown	1031 W Papeete St	33.787017	-118.276022	12/20/2007
322	SUSMP	Source Control	8 Fossil Filter CB Insert	2401 E Sepulveda Blvd	33.805192	-118.223025	12/20/2007
323	SUSMP	Infiltration	Infiltration Trench	2401 E Sepulveda Blvd	33.805192	-118.223025	12/20/2007
324	SUSMP	Source Control	7 Fossil Filter CB Insert	1715 E Denni St	33.785856	-118.240750	12/5/2007
325	SUSMP	Green Infrastructure	Vegetated Swale/Strip	1715 E Denni St	33.785856	-118.240750	12/5/2007
326	SUSMP	Green Infrastructure	Off-line Storage	1715 E Denni St	33.785856	-118.240750	12/5/2007
327	SUSMP	Green Infrastructure	2 Planter Boxes	624 N Neptune Ave	33.777492	-118.268747	11/21/2007
328	SUSMP	Permeable Pavement	Porous Pavement	624 N Neptune Ave	33.777492	-118.268747	11/21/2007
329	SUSMP	Unknown	Unknown	401 W Anaheim St	33.779894	-118.267011	11/6/2007
330	SUSMP	Source Control	3 Stormfilters	25965 S Normandie Ave	33.787581	-118.297542	11/1/2007
331	SUSMP	Source Control	2 Drain Pac CB Inserts	25965 S Normandie Ave	33.787581	-118.297542	11/1/2007
332	Site Specific	Source Control	2 Fossil Filter CB Insert	545 S Fries Ave	33.765000	-118.264136	10/29/2007
333	SUSMP	Unknown	Unknown	1824 W 1st St	33.742983	-118.316150	10/26/2007
334	SUSMP	Green Infrastructure	Filterra Filter	120 W C St	33.772522	-118.262614	9/6/2007
335	SUSMP	Green Infrastructure	2 Planter Boxes	12016 S Figueroa St	33.923019	-118.282494	8/24/2007
336	SUSMP	Source Control	Fossil Filter CB Insert	12016 S Figueroa St	33.923019	-118.282494	8/24/2007
337	SUSMP	Green Infrastructure	19 Filterra Filters	1605 N Gaffey St	33.752058	-118.292308	8/23/2007
338	SUSMP	Green Infrastructure	Downspout Filter	25825 S Vermont Ave	33.788375	-118.295594	8/23/2007
339	SUSMP	Unknown	Unknown	445 S Ferry St	33.746100	-118.261519	8/22/2007
340	SUSMP	Source Control	Slope Vegetation	1093 W 27th St	33.719622	-118.301089	8/14/2007
341	SUSMP	Source Control	Slope Vegetation	1085 W 27th St	33.719556	-118.300967	8/14/2007
342	SUSMP	Source Control	Slope Vegetation	1079 W 27th St	33.719514	-118.300825	8/14/2007
343	SUSMP	Source Control	Slope Vegetation	1073 W 27th St	33.719514	-118.300697	8/14/2007
344	SUSMP	Source Control	6 Fossil Filter CB Insert	310 Centre St	33.745150	-118.283283	8/13/2007
345	SUSMP	Permeable Pavement	6 Porous Pavement	310 Centre St	33.745150	-118.283283	8/13/2007
346	SUSMP	Green Infrastructure	10 Planter Boxes	310 Centre St	33.745150	-118.283283	8/13/2007
347	SUSMP	Source Control	7 Downspout Filters	310 Centre St	33.745150	-118.283283	8/13/2007
348	SUSMP	Green Infrastructure	3 Filterra Filters	18455 S Figueroa St	33.863333	-118.282903	8/9/2007
349	SUSMP	Source Control	Fossil Filter CB Insert	18455 S Figueroa St	33.863333	-118.282903	8/9/2007
350	SUSMP	Source Control	4 Fossil Filter CB Insert	1400 W 228th St	34.029425	-118.291481	7/30/2007
351	SUSMP	Infiltration	4 Infiltration Trenches	1400 W 228th St	34.029425	-118.291481	7/30/2007
352	SUSMP	Source Control	5 Downspout Filter	1444 W Q St	33.793844	-118.281356	7/26/2007

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG							
ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
353	SUSMP	Source Control	Fossil Filter CB Insert	1444 W Q St	33.793844	-118.281356	7/26/2007
354	SUSMP	Infiltration	Infiltration Trench	1444 W Q St	33.793844	-118.281356	7/26/2007
355	SUSMP	Unknown	Unknown	1026 W Pacific Coast Hwy	33.790114	-118.275939	7/24/2007
356	SUSMP	Unknown	Unknown	125 N Ave 60	34.111908	-118.189794	7/6/2007
357	SUSMP	Unknown	Unknown	2815 S Vermont Ave	34.028861	-118.291881	6/14/2007
358	SUSMP	Permeable Pavement	Porous Pavement	1640 W Paseo Del Mar	33.716031	-118.316594	6/4/2007
359	SUSMP	Source Control	4 Fossil Filter CB Inserts	1005 N Gaffey St	33.752111	-118.292278	5/18/2007
360	SUSMP	Unknown	Unknown	1026 N Cristobal Ave	33.784308	-118.242806	5/17/2007
361	SUSMP	Unknown	Unknown	417 N Meyler St	33.746486	-118.296783	5/9/2007
362	SUSMP	Green Infrastructure	2 Planter Boxes	815 S Grand Ave	33.736447	-118.290419	4/11/2007
363	SUSMP	Source Control	2 Fossil Filter CB Inserts	815 S Grand Ave	33.736447	-118.290419	4/11/2007
364	SUSMP	Source Control	2 Downspout Filters	420 9th St	34.044003	-118.258883	4/11/2007
365	SUSMP	Green Infrastructure	Planter Box	420 9th St	34.044003	-118.258883	4/11/2007
366	SUSMP	Source Control	2 Fossil Filter CB Inserts	1331 Torrance Blvd	33.842936	-118.300508	3/30/2007
367	SUSMP	Infiltration	Infiltration Trench	1331 Torrance Blvd	33.842936	-118.300508	3/30/2007
368	SUSMP	Green Infrastructure	2 Planter Boxes	366 W 8th St	33.736728	-118.284964	3/28/2007
369	SUSMP	Source Control	2 Fossil Filter CB Inserts	1417 Anaheim St	33.784261	-118.301928	3/17/2007
370	SUSMP	Green Infrastructure	Planter Box	1417 Anaheim St	33.784261	-118.301928	3/17/2007
371	SUSMP	Green Infrastructure	4 Downspout Filters	422 S Gaffy St	33.739911	-118.292147	2/21/2007
372	SUSMP	Source Control	Fossil Filter CB Insert	422 S Gaffy St	33.739911	-118.292147	2/21/2007
373	SUSMP	Infiltration	Infiltration Trench	422 S Gaffy St	33.739911	-118.292147	2/21/2007
374	SUSMP	Source Control	2 CDS	111 Pier S Ave	33.758961	-118.241681	12/20/2006
375	SUSMP	Source Control	254 Drain Pac CB Inserts	20843 S Normandie Ave	33.840478	-118.299633	11/27/2006
376	SUSMP	Infiltration	Infiltration Trench	601 N Avalon Blvd	33.777164	-118.262625	11/22/2006
377	SUSMP	Source Control	Drain Pac CB Insert	601 N Avalon Blvd	33.777164	-118.262625	11/22/2006
378	SUSMP	Source Control	Fossil Filter CB Insert	1338 W 228th St	33.818714	-118.300764	11/15/2006
379	SUSMP	Infiltration	Infiltration Trench	1338 W 228th St	33.818714	-118.300764	11/15/2006
380	SUSMP	Source Control	2 Fossil Filter CB Inserts	10400 S Grandee Ave	33.941381	-118.243633	10/25/2006
381	SUSMP	Green Infrastructure	2 Vegetated Swale/Strips	10400 S Grandee Ave	33.941381	-118.243633	10/25/2006
382	SUSMP	Green Infrastructure	2 Dry Wells	10400 S Grandee Ave	33.941381	-118.243633	10/25/2006
383	SUSMP	Green Infrastructure	Extended/Dry Retention Basin	525 E Anaheim St	33.780169	-118.257092	9/19/2006
384	SUSMP	Source Control	Fossil Filter CB Insert	245 7th St	34.042614	-118.249658	9/13/2006
385	SUSMP	Infiltration	Infiltration Trench	245 7th St	34.042614	-118.249658	9/13/2006
386	Site Specific	Unknown	Unknown	621 W 152nd St Bldg B	33.894842	-118.288269	10/27/2008
387	SUSMP	Infiltration	Infiltration Trench	340 S Mesa St	33.740542	-118.285206	9/3/2008
388	SUSMP	Source Control	3 Fossil Filter CB Inserts	340 S Mesa St	33.740542	-118.285206	9/3/2008
389	SUSMP	Unknown	Unknown	1001 N King Ave	33.782319	-118.276086	8/11/2008
Los Angeles County							
1	SUSMP	Source Control	2 Kristar Curb Mount FGP-36CI Filters with 1.50 CFS/Each Filtered Capacity	301 S Bandini St	33.741508	-118.298994	3/8/2010
2	SUSMP	Source Control	4 CB Fossil Filters	920 W Sepulveda Blvd	33.810291	-118.290874	3/8/2011
3	SUSMP	Source Control	1 Contech 8'X16' Stormfilter with 1.14 CFS Treatment Flow	902 W Sepulveda Blvd	33.810135	-118.290474	3/18/2010
4	SUSMP	Source Control	2 Jensen 24" Drop Inlets Model: DI242436 with Hydro-Cartridge Filters	810 W Sepulveda Blvd	33.809300	-118.288371	3/20/2012
5	SUSMP	Source Control	3 CB Filter Inserts	20425 S Hamilton Ave	33.845917	-118.286100	4/22/2013
6	SUSMP	Source Control	FGP-18F Kristar Flo-Gard Filter Inserts Model: FGP-18F	2626 E Vista Industrial	33.849846	-118.217048	5/11/2011
7	SUSMP	Source Control	CDS 2020-5	1303 W Sepulveda Blvd	33.813561	-118.299312	5/14/2013
8	SUSMP	Source Control	Maxwell IV Drainage System	1303 W Sepulveda Blvd	33.813561	-118.299312	5/14/2013
9	SUSMP	Source Control	Contech CMP Retention System	1303 W Sepulveda Blvd	33.813561	-118.299312	5/14/2013
10	SUSMP	Source Control	2 Kristar Swalegard Parkway Drain Filters Model: CDG-1A	2001 E Cashdan St	33.856083	-118.231217	6/7/2007
11	SUSMP	Source Control	2 SB-24 Fossil Filters	898 W Sepulveda Blvd	33.810075	-118.290319	6/7/2011
12	SUSMP	Source Control	Contech CDS Unit Model:CDS2015	19300 S Vermont Ave	33.856103	-118.290453	8/12/2009
13	SUSMP	Source Control	FGP-12F Filter	1259 W Carson St	33.831635	-118.298274	8/23/2010
14	SUSMP	Source Control	7 - Contech Stormwater Cartridge CB	833 W Torrance Blvd	33.842110	-118.288765	9/9/2008

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG

ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
15	SUSMP	Source Control	BIOCLEAN FLUME FILTER	19914 S Via Baron	33.850439	-118.229073	10/11/2006
16	SUSMP	Source Control	2 FGP-36F Filters	19914 S Via Baron	33.850439	-118.229073	10/11/2006
17	SUSMP	Source Control	Fossil Filter FB-24	1360 W 6th St	33.738882	-118.307015	10/21/2008
18	SUSMP	Source Control	Up Flo Filters	2310 E Gladwick St	33.852978	-118.223806	12/23/2010
19	SUSMP	Source Control	CB Insert FGP-2448F	1145 W Carson St	33.831633	-118.295990	12/28/2006
20	SUSMP	Source Control	1 Fossil Filter Flo-Gard Trench Drain Filter, THREE FLOGARD TRASH & DEBR	12714 S La Cienega Blvd	33.917194	-118.371340	2/8/2012
21	SUSMP	Source Control	3 Flo-Gard Trash and Debris Filters	12714 S La Cienega Blvd	33.917194	-118.371340	2/8/2012
22	SUSMP	Source Control	4 Rubberizer C.B. Filters	219 E Alondra St	33.885796	-118.273315	2/25/2013
23	SUSMP	Source Control	Ultra Urban Filter DI Series	357 W Compton Blvd	33.894859	-118.279833	3/7/2006
24	SUSMP	Source Control	CDS Model PMSU30-20 or Equal	1330 W Imperial Hwy	33.930921	-118.299100	3/15/2007
25	SUSMP	Source Control	2 Downspout Kristar Flo-gard Filters, Model: FG-DS4	10828 S Condon Ave	33.937761	-118.359059	3/19/2008
26	SUSMP	Source Control	3 CB Fossil Filters Models: FGP-18F & FF-12D	10714 S Western Ave	33.938971	-118.308959	5/1/2007
27	SUSMP	Source Control	4 Downspout Filters	10714 S Western Ave	33.938971	-118.308959	5/1/2007
28	SUSMP	Source Control	Flo-Gard FG-TDG24	1138 E Rosecrans Ave	33.902689	-118.254998	5/2/2013
29	SUSMP	Source Control	1 FG-TD08 Filter (1)FG-TD08 F	14200 Avalon Blvd	33.903035	-118.265201	5/6/2008
30	SUSMP	Source Control	2 CDS Units	1600 W Imperial Hwy	33.930922	-118.304771	5/10/2012
31	SUSMP	Source Control	CDS Unit, CB Filter Inserts, Low Flow Dry Wells	1600 W Imperial Hwy	33.930922	-118.304771	5/18/2011
32	SUSMP	Source Control	7 CDS Units	1600 W Imperial Hwy	33.930922	-118.304771	6/17/2011
33	SUSMP	Source Control	2 CDS Units	1600 W Imperial Hwy	33.930922	-118.304771	6/17/2011
34	SUSMP	Source Control	5 CDS Units	1600 W Imperial Hwy	33.930922	-118.304771	6/17/2011
35	SUSMP	Source Control	3 CDS Units	1600 W Imperial Hwy	33.930922	-118.304771	6/17/2011
36	SUSMP	Source Control	3 FGP-2436F Filters	14702 S Maple Ave	33.898146	-118.272549	7/16/2007
37	SUSMP	Source Control	1 Flo-Gard Fossil Filter Model: FGP-24F	13414 S Figueroa St	33.910092	-118.282661	8/20/2008
38	SUSMP	Source Control	Flo-Gard Trench Drain Filters and Fossil Filter FB-24	12735 S Main St	33.917227	-118.273986	8/28/2007
39	SUSMP	Source Control	Flo-Gard CB Filter Insert	1360 W Imperial Hwy	33.930920	-118.299564	9/10/2008
40	SUSMP	Green Infrastructure	Underground Poly Storage Tanks	11044 S Freeman Ave	33.935313	-118.348188	11/3/2010
41	SUSMP	Source Control	4 Flo-Gard FG-TDG48 Filters	14439 S Avalon Blvd	33.900818	-118.265333	12/14/2006
42	SUSMP	Source Control	CB Filters	17680 S Figueroa St	33.870573	-118.281563	4/2/2008
43	SUSMP	Source Control	Trench Drain Filter	17006 S Figueroa St	33.876875	-118.282310	6/23/2008
44	LID	Green Infrastructure	Disconnect Impervious Surfaces		33.928826	-118.375382	8/19/2010
45	LID	Green Infrastructure	Disconnect Impervious Surfaces	3137 135th St	33.909448	-118.327842	NULL
46	LID	Green Infrastructure	Disconnect Impervious Surfaces	4818 138th St	33.905772	-118.362063	10/31/2011
47	LID	Rain Barrel	Rain Barrel	10700 Firmona Ave	33.939279	-118.356672	12/15/2009
48	LID	Green Infrastructure	Disconnect Impervious Surfaces	14106 Shoup Ave	33.903442	-118.363908	NULL
49	LID	Unknown	Other		33.930653	-118.305454	NULL
50	LID	Green Infrastructure	Disconnect Impervious Surfaces	3343 132nd St	33.912609	-118.332324	8/1/2012
51	LID	Green Infrastructure	Disconnect Impervious Surfaces	4825 134th Pl	33.910594	-118.362194	6/3/2010
52	LID	Green Infrastructure	Disconnect Impervious Surfaces		33.912749	-118.331088	NULL
53	LID	Rain Barrel	Rain Barrel		33.919496	-118.281407	1/24/2012
54	LID	Unknown	Other	4331 Lennox Blvd	33.938677	-118.351849	NULL
55	LID	Green Infrastructure	Disconnect Impervious Surfaces	5138 135th St	33.909221	-118.368393	2/9/2011
56	LID	Green Infrastructure	Disconnect Impervious Surfaces	20625 Catalina St	33.842936	-118.294192	NULL
57	LID	Green Infrastructure	Dry Well	1000 Carson St	33.829799	-118.294727	7/19/2010
58	LID	Unknown	Other	11507 Western Ave	33.929445	-118.310221	NULL
59	LID	Source Control	Landscaping and Irrigation	125 El Segundo Blvd	33.916800	-118.272983	NULL
60	LID	Green Infrastructure	Disconnect Impervious Surfaces	5232 119th St	33.925198	-118.371268	NULL
61	LID	Rain Barrel	Rain Barrel	10935 Osage Ave	33.936168	-118.346417	NULL
62	LID	Rain Barrel	Rain Barrel	5349 119th Pl	33.924824	-118.373838	NULL

Table O.6: Detailed List of Existing Distributed BMPs in DC WMG

ID	Data Source	BMP Category	Project Description	Address	Latitude	Longitude	Date Active
63	LID	Unknown	Other	22433 Vermont Ave	33.822400	-118.290777	NULL
64	LID	Green Infrastructure	Disconnect Impervious Surfaces	3356 152nd St	33.893586	-118.332670	NULL
65	LID	Source Control	Landscaping and Irrigation	3546 132nd st	33.912082	-118.334631	NULL
66	LID	Green Infrastructure	Disconnect Impervious Surfaces	5024 112th St	33.932534	-118.366212	6/21/2011
67	LID	Green Infrastructure	Disconnect Impervious Surfaces	3535 Redondo Beach Blvd	33.882953	-118.339007	1/31/2011
68	LID	Green Infrastructure	Disconnect Impervious Surfaces	14425 Loness Ave	33.900795	-118.254748	NULL
69	LID	Rain Barrel	Rain Garden	1525 El Segundo Blvd	33.916751	-118.303177	NULL
70	LID	Green Infrastructure	Disconnect Impervious Surfaces	14615 Chadron Ave	33.898822	-118.328934	NULL
71	LID	Unknown	Other	15730 Figueroa St	33.887734	-118.281572	NULL
72	LID	Rain Barrel	Rain Barrel	15303 Ermanita Ave	33.892549	-118.332770	4/20/2010
73	LID	Source Control	Landscaping and Irrigation	5500 119th Pl	33.924285	-118.376798	NULL
74	LID	Rain Barrel	Rain Barrel	5238 119th St	33.925198	-118.371439	11/15/2011
75	LID	Source Control	Landscaping and Irrigation	5413 118th St	33.927549	-118.374916	NULL
76	LID	Rain Barrel	Rain Barrel	10820 Osage Ave	33.937516	-118.345797	11/30/2010
77	LID	Unknown	Other	11633 Western Ave	33.927562	-118.310227	NULL

Attachment P

Potential Regional BMP Projects Worksheet

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TECHNICAL MEMORANDUM

To: Dominguez Channel Watershed Management Group

From: Team Dominguez

Date: 3/9/2015

Subject: **Task F.4.2.2 – Preliminary List of Regional Projects - Revised**

1 Introduction

This technical memorandum presents a list of parcels that have the potential for becoming multi-benefit regional projects as part of the Dominguez Channel Enhanced Watershed Management Plan (EWMP). The sites were selected according to general approach presented in Section 3.1.4 of *the Enhanced Watershed Management Program Work Plan for the Dominguez Channel Watershed Management Area Group* June 2014 report (Work Plan) and subsequent August 15, 2014 *Task 4.2.1 – Regional Project Proposed Initial Ranking Criteria (Draft)* memorandum (Ranking Memorandum: attached to this memo).

To summarize the ranking criteria, Table 1 lists the criteria and how the parcels were scored based on those criteria. The right most column of Table 1 lists if Geographical Information System (GIS) coverage was useable for autonomous scoring of the parcels. Following the autonomous scoring of the parcels, parcels were visually evaluated to assess if they could conceivably provide sufficient space for a regional project that retains the 85^{th} percentile storm from a catchment area outside the parcel itself.

For visual evaluation, the following screening criteria were adhered to:

1. Score using the GIS approach.
2. Identify Assessors Identification Numbers (AIN) ending in 900s. These represented tax exempt parcels, which, if tax-exempt, were assumed therefore to be government owned.
3. Specify which Tier a parcel should be categorized in based on its land use.

Tier 1: 900 coded open space, parks, golf courses, vacant

Tier 2: 900 coded everything else, with the exception of education

Tier 3: non-900 coded (privately owned) open space, parks, golf courses, vacant

Tier 4: education – both 900 and non-900 coded

Tier 5: everything else – non-900, non-education, non-park/open space/golf course/vacant.

4. Exclude Tier 5; if a Watershed Management Group (WMG) member or stakeholder brings a Tier 5 parcel forward, it can be evaluated further for feasibility.
5. Exclude parcels < 0.25 acres. These would have insufficient space for regional retention.
6. Exclude parcels that are part of natural water body.
7. Exclude parcels at edge of the Dominguez Channel (DC) Watershed Management Group Area (WMGA). These would not collect significant water from the DC WMGA jurisdictions.

8. Exclude parcels with more than 60 to 70% buildings based on visual inspection of Google Earth and Google Maps views available on or after December 2014

9. Exclude open space parcels that have been developed based on visual inspection. It is important to note that a number of parcels labeled as "open space" were developed and their land use designation not changed in the parcel data available.

10. Exclude parcels that have less than approximately 10 acres tributary to them. This was not strictly adhered to, but in general, parcels that could collect water from 10 acres upstream of them were preferred.

11. Of the 900 series that survive this screening, review the ownership. If available data indicates the property is owned by WMG agencies, select as potential regional projects.

12. Review the unselected 900 series and the non-900 series that survive this screening and list the top 100 to 200 scores from those.

13. Visually inspect the top 100 to 200 and identify those that may have better potential to explore further based on potential catchment area, potential space on site and size of site, and potential ownership

It is important to note the following:

- GIS data contained no information regarding how much of the parcel was covered with structures and how much was potentially open in the form of a parking lot or landscaped area.
- Storm drains identified in the database are Los Angeles County storm drains. As such, there may be a closer storm drain to the selected parcel than indicated in the database.
- Streets rights of way were not included in this screening analysis for consideration as regional projects. They will be included in subsequent analyses of distributed regional or distributed projects needed to achieve planning objectives.
- The only data on the presence or absence of contamination was the listing of superfund sites. Other contamination information was not readily available. This would need to be evaluated on a parcel by parcel basis during project development.
- Depth to groundwater was not available. This would need to be evaluated on a parcel by parcel basis during project development.
- In general, public parcels listed as parks, vacant, or open space were evaluated as having the potential to accommodate regional projects. Schools, public buildings, and private parcels were listed, but those investigated were not promising due to small available unbuilt footprint on the parcel, small WMG drainages leading to the parcel, or ownership challenges with accessing the parcel. Parcels with more than one land use were biased to the more desirable use to make sure the parcel received a manual screening.
- Initial scoring suggested that land use and proximity to an outfall were not weighted heavily enough for the better parcels to emerge with higher scores. Scorings for those categories were doubled to provide heavier weighting for those criteria.
- Some sites contain multiple parcels. If a parcel at a project site is comparatively smaller than the other parcel(s) and if the project will not be sited on that parcel it is not listed and its score is not considered in the average score.

Attachment 1 contains summary tables showing Tiers 1 through 4 within each WMG jurisdiction. Following the tables are figures showing locations of and potential footprints for the nine recommended projects and the locations of the parcels fitting into tiers 1 through 4. The potential project footprints are based on stormwater storage areas of sufficient size to infiltrate in 72 hours or to store the 85th percentile storm in 10 feet in depth unless otherwise noted. In most cases, areas needed to infiltrate in 72 hours were larger than the area needed to store the storm volume in 10 feet of depth.

Table 1. Ranking Criteria								
Criteria		Points						GIS Coverage
		0	1	2	3	4	5	
General Criteria	Proximity to an Outfall (mile) (x2)	3.0 ≤ X	2.5 ≤ X < 3.0	2.0 ≤ X < 2.5	1.5 ≤ X < 2.0	1.0 ≤ X < 1.5	0 ≤ X < 1.0	X
	Proximity to 36" Storm Drain (feet)[1]	1,000 ≤ X	800 ≤ X < 1000	600 ≤ X < 800	400 ≤ X < 600	200 ≤ X < 400	0 ≤ X < 200	X
	Land Use (x2)	Restricted Area (DOD)	Private requiring demolition of structures	Private with large parking lots requiring no changes to land use	Schools and Golf Courses	Public Buildings	Public Open Space	X
	Parcel Size (acre)	X < 0.25	0.25 ≤ X < 1.0	1.0 ≤ X < 2.0	2.0 ≤ X < 3.0	3.0 ≤ X < 4.0	4.0 ≤ X	X
	Catchment Area[2]	X<1	1 ≤ X < 25	25 ≤ X < 50	50 ≤ X < 75	75 ≤ X < 100	100 ≤ X	
Underlying Soil Conditions	Contamination[2]	Superfund	Possible Contamination				Certain no contamination	
	CPI		1	2	3	4	5	X
	Soil Infiltration Rate (inches/hour)	X < 0.3	0.3 ≤ X < 0.5	0.5 ≤ X < 0.7	0.7 ≤ X < 0.9	0.9 ≤ X < 1.1	1.1 ≤ X	X
	Slope (%)	10 < X	5 < X ≤ 10	3 < X ≤ 5	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	
	Liquefaction Areas	Possible Liquefaction					No Liquefaction	X
	Landslide Areas	Possible Landslide					No Landslide	X
	Depth to Groundwater (feet)[2,3]		X ≤ 10				10 < X	
	Depth to Storm Drain Infrastructure (feet)[2]	15 ≤ X	10 ≤ X < 15	5 ≤ X < 10	3 ≤ X < 5	0 < X < 3	X=0 (open channel/ gutter)	

Notes:

1. Based on distance to midpoint of GIS pipeline segment to centroid of parcel.

2 GIS data coverage not currently available.

3 Site specific conditions may allow variances.

2 Screening

Tables 2 through 9 summarize the results of the site ranking analyses for each of the criteria with GIS coverage and Table 10 summarizes the results for all criteria. Land use was weighted by two times because it is the most important screening criteria. Distance to outfall was also weighted by two times due to parcels ranking high that were at the very edge of the watershed boundary with little or no contributing drainage area. Criteria without GIS coverage were not considered in the total score and would need to be evaluated on a parcel by parcel basis during project development.

Table 2. Proximity to an Outfall (mile)

Criteria	Score	No. of Parcels	% of Total
3.0 ≤ X	0	0	0%
2.5 ≤ X < 3.0	2	3,310	3%
2.0 ≤ X < 2.5	4	9,862	10%
1.5 ≤ X < 2.0	6	10,904	11%
1.0 ≤ X < 1.5	8	20,702	21%
X < 1.0	10	52,948	54%
	Grand Total	**97,726**	**100%**

Table 3. Proximity to Storm Drains >= 36 in (Feet)

Criteria	Score	No. of Parcels	% of Total
1000 ≤ X	0	38,247	39%
800 ≤ X < 1000	1	10,740	11%
600 ≤ X < 800	2	11,292	12%
400 ≤ X < 600	3	12,168	12%
200 ≤ X < 400	4	10,906	11%
X < 200	5	14,373	15%
	Grand Total	**97,726**	**100%**

Table 4. Land Use

Criteria	Score	No. of Parcels	% of Total
Restricted Area (DOD)	0	32	0%
Private Requiring Demolition of Structures	2	86,465	88%
Private with large parking lots requiring no changes to land use	4	7,899	8%
Schools and Golf Courses	6	676	1%
Public Buildings	8	652	1%
Public Open Space	10	2,002	2%
	Grand Total	**97,726**	**100%**

Table 5. Parcel Size (Acres)

Criteria	Score	No. of Parcels	% of Total
X < 0.25	0	76,403	78%
0.25 ≤ X < 1.0	1	9,729	10%

Table 5. Parcel Size (Acres)			
Criteria	**Score**	**No. of Parcels**	**% of Total**
1.0 ≤ X < 2.0	2	3,562	4%
2.0 ≤ X < 3.0	3	2,420	2%
3.0 ≤ X < 4.0	4	1,111	1%
4.0 ≤ X	5	4,501	5%
	Grand Total	**97,726**	**100%**

Table 6. CPI Score			
Criteria	**Score**	**No. of Parcels**	**% of Total**
1	1	22,646	23%
2	2	0	0%
3	3	2,004	2%
4	4	19,243	20%
5	5	53,833	55%
	Grand Total	**97,726**	**100%**

Table 7. Soil Infiltration Rate (in/hr)			
Criteria	**Score**	**No. of Parcels**	**% of Total**
X < 0.3	0	17,301	18%
0.3 ≤ X < 0.5	1	68,544	70%
0.5 ≤ X < 0.7	2	0	0%
0.7 ≤ X < 0.9	3	11,881	12%
0.9 ≤ X < 1.1	4	0	0%
1.1 ≤ X	5	0	0%
	Grand Total	**97,726**	**100%**

Table 8. Liquefaction Areas			
Criteria	**Score**	**No. of Parcels**	**% of Total**
Possible Liquefaction	0	5,480	6%
No Liquefaction	5	92,246	94%
	Grand Total	**97,726**	**100%**

Table 9. Landslide Areas			
Criteria	**Score**	**No. of Parcels**	**% of Total**
Possible Landslide	0	919	1%
No Landslide	5	96,807	99%
	Grand Total	**97,726**	**100%**

Table 10. Total Score		
Score	**No. of Parcels**	**% of Total**
25 and below	28,625	29.3%
26 - 30	47,497	48.6%
31 - 35	19,082	19.6%

Table 10. Total Score		
Score	**No. of Parcels**	**% of Total**
36 – 39	2,391	2.45%
40	79	0.081%
41	21	0.021%
42	20	0.020%
43	7	0.007%
44	3	0.003%
46	1	0.001%
Grand Total	97,726	100%

Table 11 shows the tiers, the land uses in those tiers, and whether the tiers are exclusively 900 codes, non-900 codes, or both.

From the tier 1 list, after the additional manual screening, a total of nine parcels were identified that show promise for placement of regional projects that capture some catchment area and may be controlled by Watershed Management Group (WMG) members for: (listed in order from the northern part of the watershed to the southern part)

1. Darby Park
2. El Segundo
3. Ramona Park
4. Jim Thorpe Park
5. Chester Washington Golf Course
6. Hawthorne Memorial Park
7. Harbor City Park
8. Wilmington Recreation Center
9. Averill Park

Table 11: Tiered Sorting of Parcels Key			
Tier		LU-ALF	900 (Non-Taxed)
1	Public Open Space	Developed Local Parks and Recreation	Yes
		Developed Regional Parks and Recreation	
		Golf Courses	
		Other Open Space and Recreation	
		Vacant Area	
		Vacant Undifferentiated	
2	Government Land Uses Possibly Compatible	Attended Pay Public Parking Facilities	Yes
		Base (Built-up Area)	
		Bus Terminals and Yards	
		Chemical Processing	
		Commercial Recreation	
		Commercial Storage	
		Communication Facilities	
		Duplexes, Triplexes and 2-or 3-Unit Condominium[1]	
		Fire Stations	
		Government Offices	
		Harbor Facilities	
		High-Density Single Family Residential	
		Horse Ranches	
		Hotels and Motels	
		Improved Flood Waterways and Structures	
		Irrigated Cropland and Improved Pasture Land	
		Low- and Medium-Rise Major Office Use	
		Low-Density Single Family Residential	
		Low-Rise Apartments, Condominiums, and Townhouses[1]	
		Maintenance Yards	
		Major Medical Health Care Facilities	
		Mineral Extraction - Other Than Oil and Gas	
		Mixed Commercial and Industrial	
		Mixed Multi-Family Residential	
		Mixed Residential	
		Mixed Transportation	
		Mixed Urban	
		Modern Strip Development	
		Non-Attended Public Parking Facilities	
		Nurseries	
		Older Strip Development	
		Open Storage	
		Other Public Facilities	
		Other Special Use Facilities	
		Park-and-Ride Lots	
		Railroads	
		Railroads-Open Storage	
		Railroads-Truck Terminals	
		Religious Facilities	
		Wholesaling and Warehousing	
3	Golf Courses and Private Open Space	Developed Local Parks and Recreation	No
		Developed Regional Parks and Recreation	
		Golf Courses	
		Other Open Space and Recreation	
		Vacant Area	

Table 11: Tiered Sorting of Parcels Key			
Tier		LU-ALF	900 (Non-Taxed)
		Vacant Undifferentiated	
4	Schools	Colleges and Universities	No and Yes
		Elementary Schools	
		Senior High Schools	
		Trade Schools and Professional Training Facilities[1]	
		Junior or Intermediate High Schools	
5	Government Land Uses Not Likely Compatible	Airports	Yes
		Base Government Offices	
		Base High-Density Single Family Residential	
		Cemeteries	
		Electrical Power Facilities	
		Electrical Power Facilities-Powerlines (Urban	
		Freeways and Major Roads	
		Harbor Water Facilities	
		High-Rise Major Office Use	
		Manufacturing, Assembly, and Industrial Services[1]	
		Marina Water Facilities	
		Medium-Rise Apartments and Condominiums	
		Mineral Extraction - Oil and Gas	
		Natural Gas and Petroleum Facilities	
		Petroleum Refining and Processing	
		Police and Sheriff Stations	
		Railroads-Manufacturing, Assembly, and Industrial Services[1]	
		Regional Shopping Center	
		Research and Development	
		Retail Centers (Non-Strip)[1]	
		Special Care Facilities	
		Trailer Parks and Mobile Home Courts[1]	
		Truck Terminals	
		Water Storage Facilities	
		Water Transfer Facilities	
		Water, Undifferentiated	
	All other non-government land uses		No
1	Database field truncates at 45 characters. Exact land use title assumed.		

3 Determination of the 85th Percentile, 24 Hour Storm

After the parcels with the highest probability of becoming regional multi-benefit project locations were identified, the approximate drainage areas tributary to each parcel selected were delineated using the available 10-foot contour coverage, subwatershed boundaries, and storm drain GIS data supplied by the WMG. The 85th percentile, 24-hour storm water quality volume was calculated based on the tributary drainage area and the provided design runoff inches calculated as part of the subwatershed data set. Attachment 1 shows the parcels and catchment delineations for each of the 9 potential projects in order from the northern part of the watershed to the southern part.

4 Project Descriptions

The attached summary table provides information for each potential project site. This section presents supporting details and facility opportunities and constraints. Facilities were sized in two ways, 1) for a 10 foot depth and 2) for the depth resulting from the area required to infiltrate the water quality volume in 72-hours given provided estimates of local infiltration rates. Refer to the attached table for calculation details that include:

Design Volume (ac-ft) = Drainage Area (acres)*Design Runoff (in/acre)*(1ft/12in)

Footprint (acre) $_{\text{Design Depth 10 ft}}$ = Design Volume (ac-ft)/10 ft

Length and Width (ft) = Square Root (Footprint (acre) $_{\text{Design Depth 10 ft}}$*43,560)
this represents the length and width of a square

Time to Drawdown (hr) $_{\text{10 feet depth}}$ = 10 ft/[Infiltration Rate (in/hr)*(ft/12 in)]

72-hour Drawdown Design Depth (ft) = 72 hr*[Infiltration Rate (in/hr)*(ft/12 in)]

72-hour Infiltration Depth Design Footprint (acre) = Design Volume (ac-ft)/ 72-hour Drawdown Design Depth (ft)

Where,

ac-ft = acre-feet

in = inches

ft = feet

hr = hour

4.1 Potential Project #1: Darby Park Project Site

The Darby Park parcel is owned by the City of Inglewood. The parcel totals 19.3 acres with about half open space park. There are several land uses tributary to the site as shown in the attached Darby Project Site figure. Dependent on the site specific soils, it is anticipated that the site will be able to capture the entire 85th percentile event water quality volume. Details of the site are presented in Table 12 and a conceptual footprint drawing is included in the attachments (Darby Park Project Site Concept Footprint).

Table 12. Darby Park Project Site

Item	Detail
Ownership	City of Inglewood
AIN	4025-011-900
Address	3400 W Arbor Vitae St, Inglewood, CA 90305
Infiltration Rate (in/hr)	0.45
Groundwater Basin	Central
Site Area (acre)	19.3
Ranking Score	41 (out of 50)
Drainage Area (acre)	106
Design Volume (ac-ft)	5.2
10 Foot Depth Design Footprint (acre)	0.5
72-hour Infiltration Depth Design Footprint (acre)	1.9

4.2 Potential Project #2: El Segundo Project Site

The El Segundo project site parcels are owned by the City of El Segundo and together are approximately 7.4 acres of primarily open space. There are several land uses tributary to the site as shown in the attached El Segundo Project Site figure. Dependent on the site specific soils, it is anticipated that to capture the entire 85th percentile event water quality volume most if not all of the site will be required. Details of the site are presented in Table 13 and a conceptual footprint drawing is included in the attachments (El Segundo Project Site Concept Footprint).

Table 13. El Segundo Project Site	
Item	**Detail**
Ownership	City of El Segundo
AIN	4138-014-914; 4138-014-914
Address	South Hughes Way and Allied Way, El Segundo, CA
Infiltration Rate (in/hr)	0.81
Groundwater Basin	West Coast
Site Area (acre)	7.39 (6.2 + 1.19)
Ranking Score	35 average (out of 50) (Average of 34 and 36)
Drainage Area (acre)	574
Design Volume (ac-ft)	27
10 Foot Depth Design Footprint (acre)	2.7
72-hour Infiltration Depth Design Footprint (acre)	5.6

4.3 Potential Project #3: Ramona Park Project Site

The Ramona Park parcel is owned by the City of Hawthorne and is an approximately 1.7 acres primarily open space site. There are several land uses tributary to the site as shown in the attached Ramona Project Site figure. Dependent on the site specific soils, it is anticipated that to capture the entire 85th percentile event water quality volume most, if not, all of the site will be required and may not be able to capture the entire design event. The design of the facility will require an approximately 900 foot diversion at Inglewood Boulevard running along West 137th Street. Details of the site are presented in Table 14 and a conceptual footprint drawing is included in the attachments (Ramona Park Project Site Concept Footprint).

Table 14. Ramona Park Project Site	
Item	**Detail**
Ownership	City of Hawthorne
AIN	4043-002-904
Address	4662 W 136th St, Hawthorn CA 90250
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast
Site Area (acre)	1.7
Ranking Score	35 (out of 50)
Drainage Area (acre)	273
Design Volume (ac-ft)	12.9
10 Foot Depth Design Footprint (acre)	1.3
72-hour Infiltration Depth Design Footprint (acre)	4.8

4.4 Potential Project #4: Jim Thorpe Park Project Site

The Jim Thorpe Park parcels are owned by the City of Hawthorne and together are an approximately 8.65 acres primarily open space site. There are several land uses tributary to the site as shown in the attached Jim Thorpe Park Project Site figure. Dependent on the site specific soils, it is anticipated that the site will be able to capture the entire 85th percentile event water quality volume depending on the local soil infiltration rate. Note that surface soils have been designated with a very low infiltration rate; however, infiltration capacity may increase or decrease with depth. Details of the site are presented in Table 15 and a conceptual footprint drawing is included in the attachments (Jim Thorpe Park Project Site Concept Footprint).

Table 15. Jim Thorpe Project Site

Item	Detail
Ownership	City of Hawthorne
AIN	4051-032-903; 4051-029-901; 4051-030-901
Address	14100 Prairie Ave, Hawthorne, CA 90250
Infiltration Rate (in/hr)	0.27
Groundwater Basin	West Coast
Site Area (acre)	8.65 (4.1+3.53+1.02)
Ranking Score	40 (average) (out of 50) (Average of 42, 40, and 37)
Drainage Area (acre)	378
Design Volume (ac-ft)	16
10 Foot Depth Design Footprint (acre)	1.6
72-hour Infiltration Depth Design Footprint (acre)	9.7

4.5 Potential Project #5: Chester Washington Golf Course Project Site

The Chester Washington Golf Course parcel for the project is owned by Los Angeles County and operated under lease by American Golf and is an approximately 116 acre primarily open space site. There is an attached parcel for the Golf Course that is not needed for project siting and not shown here. There are several land uses tributary to the site as shown in the attached Chester Washington Golf Course Project Site figure. Based on the information provided by the WMG, the site appears to be able to accept stormwater flows from the north and the southeast. Dependent on the site specific soils, it is anticipated that the site will be able to capture the entire 85th percentile event water quality volume for both the north and the southeast tributary areas. Details of the site are presented in Table 16 and a conceptual footprint drawing is included in the attachments (Chester Washington Golf Course Project Site Concept Footprint).

Table 16. Chester Washington Golf Course Project Site

Item	Detail	
Ownership	Los Angeles County (Operated under lease by American Golf)	
AIN	4057-032-900	
Address	1930 W 120th St, Los Angeles, CA 90047	
Infiltration Rate (in/hr)	0.45	
Groundwater Basin	West Coast and Central	
Site Area (acre)	116	
Ranking Score	46 (out of 50)	
Tributary Area	North	Southeast

Table 16. Chester Washington Golf Course Project Site		
Item	**Detail**	
Drainage Area (acre)	636	542
Design Volume (ac-ft)	25.8	22
10 Foot Depth Design Footprint (acre)	2.6	2.2
72-hour Infiltration Depth Design Footprint (acre)	9.5	8.1

4.6 Potential Project #6: Hawthorne Memorial Park Project Site

The Hawthorne Memorial Park parcel is owned by City of Hawthorne and is approximately 6.59 acres of primarily open space site. There are several land uses tributary to the site as shown in the attached Hawthorne Memorial Park Project Site figure. Dependent on the site specific soils, it is anticipated that the site will be able to capture the entire 85th percentile event water quality volume. Details of the site are presented in Table 17 and a conceptual footprint drawing is included in the attachments Hawthorne Memorial Park Project Site Concept Footprint).

Table 17. Hawthorne Memorial Park Project Site	
Item	**Detail**
Ownership	City of Hawthorne
AIN	4049-009-904
Address	3901 W. El Segundo Blvd. Hawthorne, CA 90250
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast Basin
Site Area (acre)	6.59
Ranking Score	41 (Out of 50)
Drainage Area (acre)	202
Design Volume (ac-ft)	11.3
10 Foot Depth Design Footprint (acre)	1.1
72-hour Infiltration Depth Design Footprint (acre)	4.2

4.7 Potential Project #7: Harbor City Park

The Harbor City Park parcels are owned by the City of Los Angeles and have the combined area of approximately 7.6 acres comprised of primarily open space. There are several land uses tributary to the site as shown in the attached Harbor City Park Project Site figure. Dependent on the site specific soils, it is anticipated that to capture the entire 85th percentile event water quality of the large tributary catchment area. The catchment area also includes tributary areas outside the Watershed Management Area (WMA) that would need to be investigated in more detail to understand if it would be feasible to reroute stormwater flows or only divert at strategic locations. For planning purposes, it has been assumed that only half of the total catchment area is diverted to the parcel and the remainder is diverted to a northern drainage at a major stormwater interchange just west of the parcels. Details of the site are presented in Table 18 and a conceptual footprint drawing is included in the attachments (Harbor City Park Project Site Concept Footprint).

Table 18. 7. Harbor City Park Project Site

Item	Detail
Ownership	City of Los Angeles
AIN	7439-027-900, 7439-027-902, 7439-027-903; 7439-027-904, 7439-027-905; 7439-027-906 (Harbor City Park)
Address	24901 Frampton Ave, Los Angeles, CA 90710;
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast
Site Area (acre)	7.62 (2.97+1.1+2.8+0.75)
Ranking Score	37 (average) (out of 50) (Average of 38, 37, 38, and 36)
Drainage Area (acre)	4,460 (total catchment, 2,230 diverted)
Design Volume (ac-ft)	77
10 Foot Depth Design Footprint (acre)	7.7
72-hour Infiltration Depth Design Footprint (acre)	28.6*

*Note: The 72-hour Infiltration Depth Design Footprint cannot be used at this location. Only the 10 foot depth design footprint can fit at this location.

4.8 Potential Project #8: Wilmington Recreation Center Project Site

The Wilmington Recreation Center parcels are owned by the City of Los Angeles and together are an approximately 7.3 acres primarily open space site. There are several land uses tributary to the site as shown in the attached Wilmington Recreation Center Project Site figure. Dependent on the site specific soils, it is anticipated that the site will be able to capture the entire 85^{th} percentile event water quality volume. The design of the facility will require an approximately 800 foot diversion at McDonald Avenue running along West C Street. Details of the site are presented in Table 19 and a conceptual footprint drawing is included in the attachments (Wilmington Recreation Center Project Site Concept Footprint).

Table 19. Wilmington Recreation Center Project Site

Item	Detail
Ownership	City of Los Angeles
AIN	7417-020-900; 7417-021-900
Address	325 N Neptune Ave, Wilmington, CA 90744
Infiltration Rate (in/hr)	0.45
Groundwater Basin	West Coast
Site Area (acre)	3 (3.76+3.55)
Ranking Score	38 out of 50 (Average of 38 and 38)
Drainage Area (acre)	273
Design Volume (ac-ft)	12.9
10 Foot Depth Design Footprint (acre)	1.3
72-hour Infiltration Depth Design Footprint (acre)	4.8

4.9 Potential Project #9: Averill Park Project Site

The Averill Park parcel is owned by the City of Los Angeles and is an approximately 10.7 acres primarily open space site. There are several land uses tributary to the site as shown in the attached Averill Park Project Site figure. Dependent on the site specific soils, it is anticipated that most, if not all, of the site will be required to capture the entire 85th percentile event water quality volume. The catchment area also includes tributary areas outside the WMA that would need to be investigated in more detail to understand if it would be feasible to reroute stormwater flows or only divert at strategic locations. Details of the site are presented in Table 20 and a conceptual footprint drawing is included in the attachments (Averill Park Project Site Concept Footprint).

Table 20. Averill Park Project Sites

Item	Detail
Ownership	City of Los Angeles
AIN	7560-023-900
Address	1300 S Dodson Ave, San Pedro, CA 90732
Infiltration Rate (in/hr)	0.40
Groundwater Basin	West Coast
Site Area (acre)	10.7
Ranking Score	42 out of 50
Drainage Area (acre)	1,376
Design Volume (ac-ft)	21.4
10 Foot Depth Design Footprint (acre)	2.1
72-hour Infiltration Depth Design Footprint (acre)	8.9

5 Additional Parcels Evaluated

The tables in Attachment 2 show parcels for each agency in the WMG that had relatively high scores, had potentially useable features, and were evaluated for the potential to accommodate a regional project. The recommended parcels are shown in these tables. Parcels that may have some additional potential are shown as well. Each WMG agency can review these tables to identify if they would propose additional projects for inclusion in the EWMP at their discretion.

Please note that not including a potential project in the EWMP does not preclude any agency from developing it as a project to achieve water quality or other benefits during implementation of the EWMP. The EWMP will have a number of distributed projects for which precise locations are not specifically assigned, but the quantity of which will be identified to achieve the water quality goals of the EWMP. Additional regional projects can also be developed as the EWMPs are implemented at the discretion of a WMG agency.

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Attachment 1: Project Site Concepts

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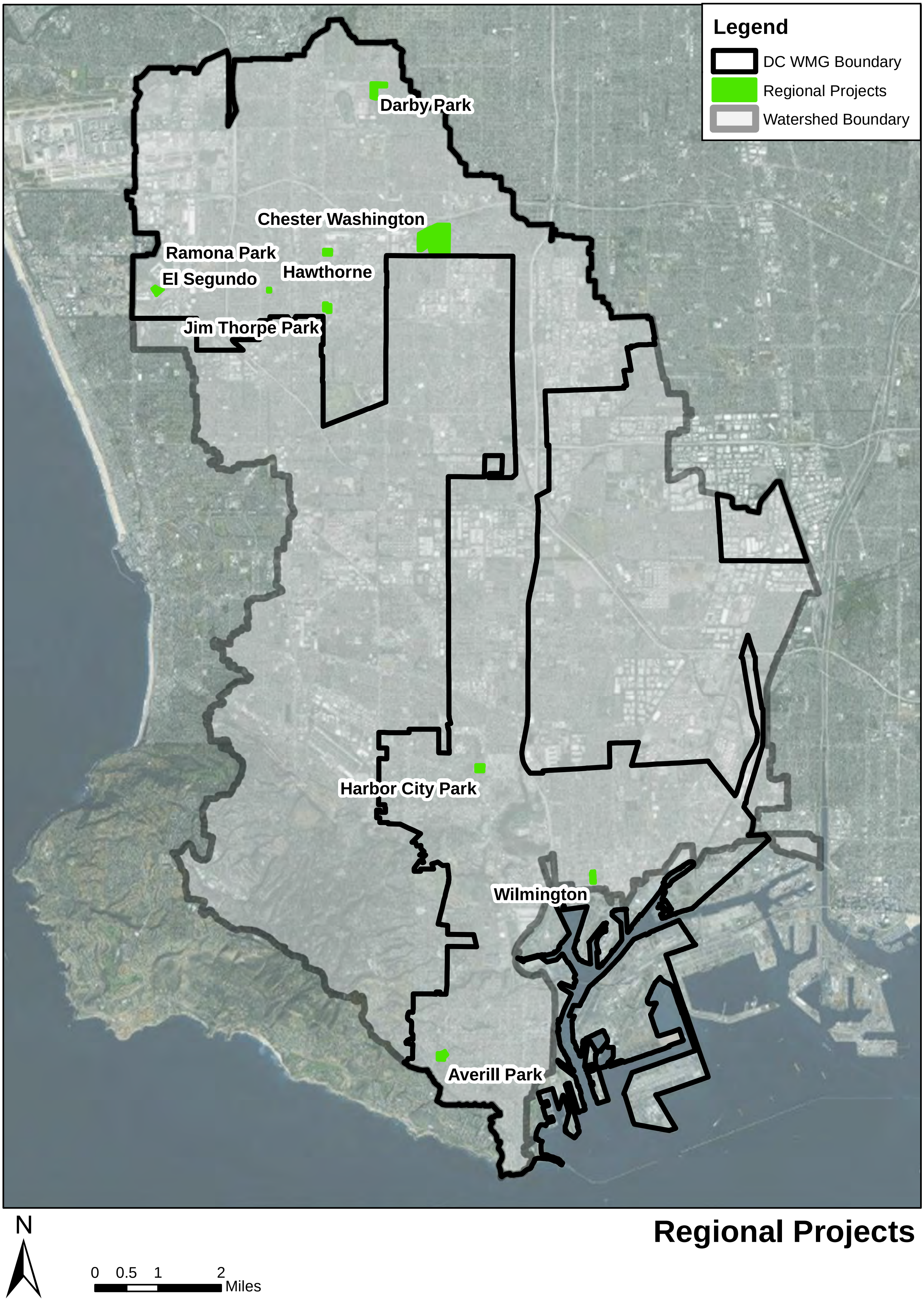

Regional Projects

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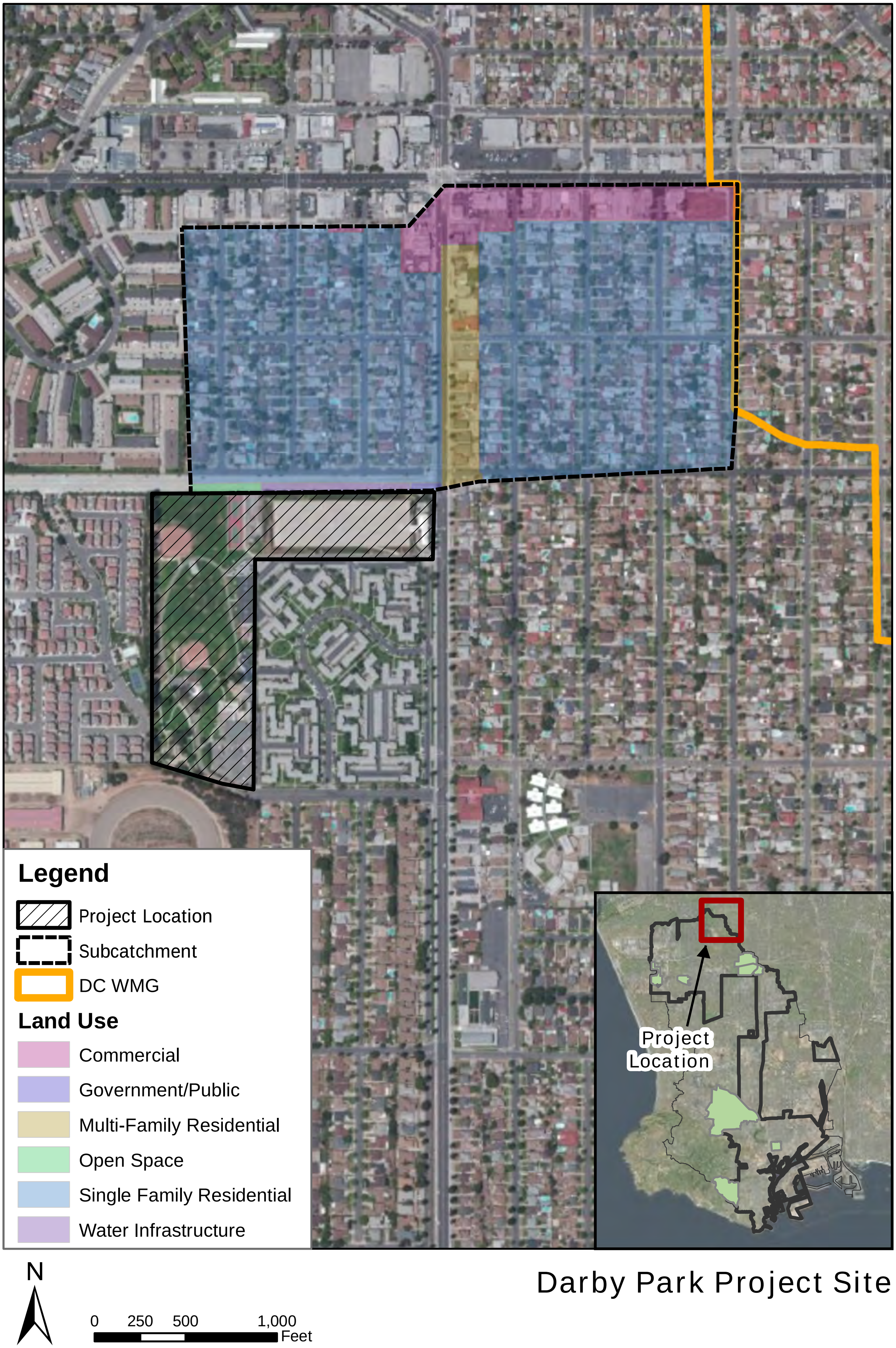

Darby Park Project Site

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Darby Park Project Site Concept Footprint

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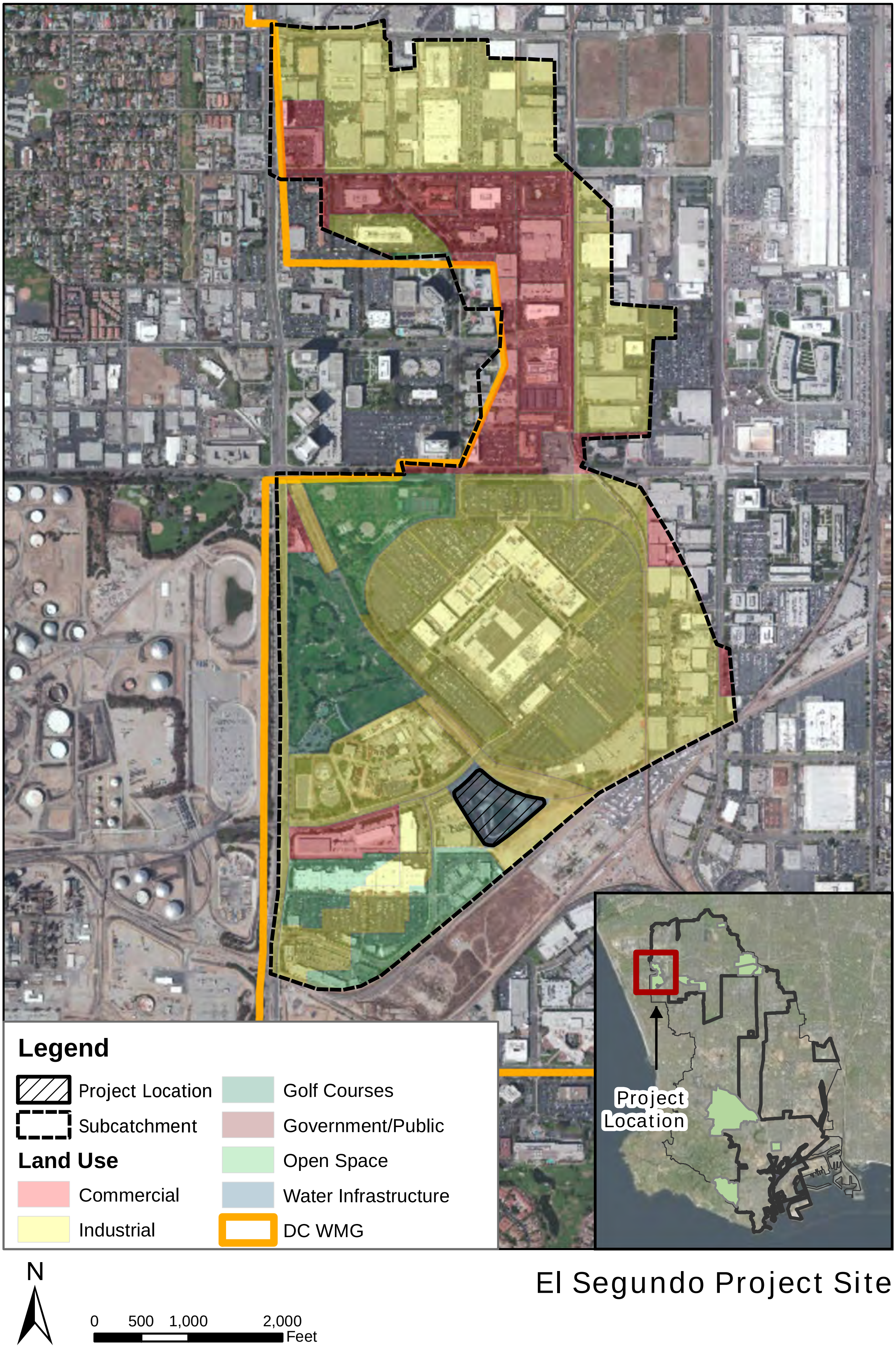

El Segundo Project Site

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El Segundo Project Site
Concept Footprint

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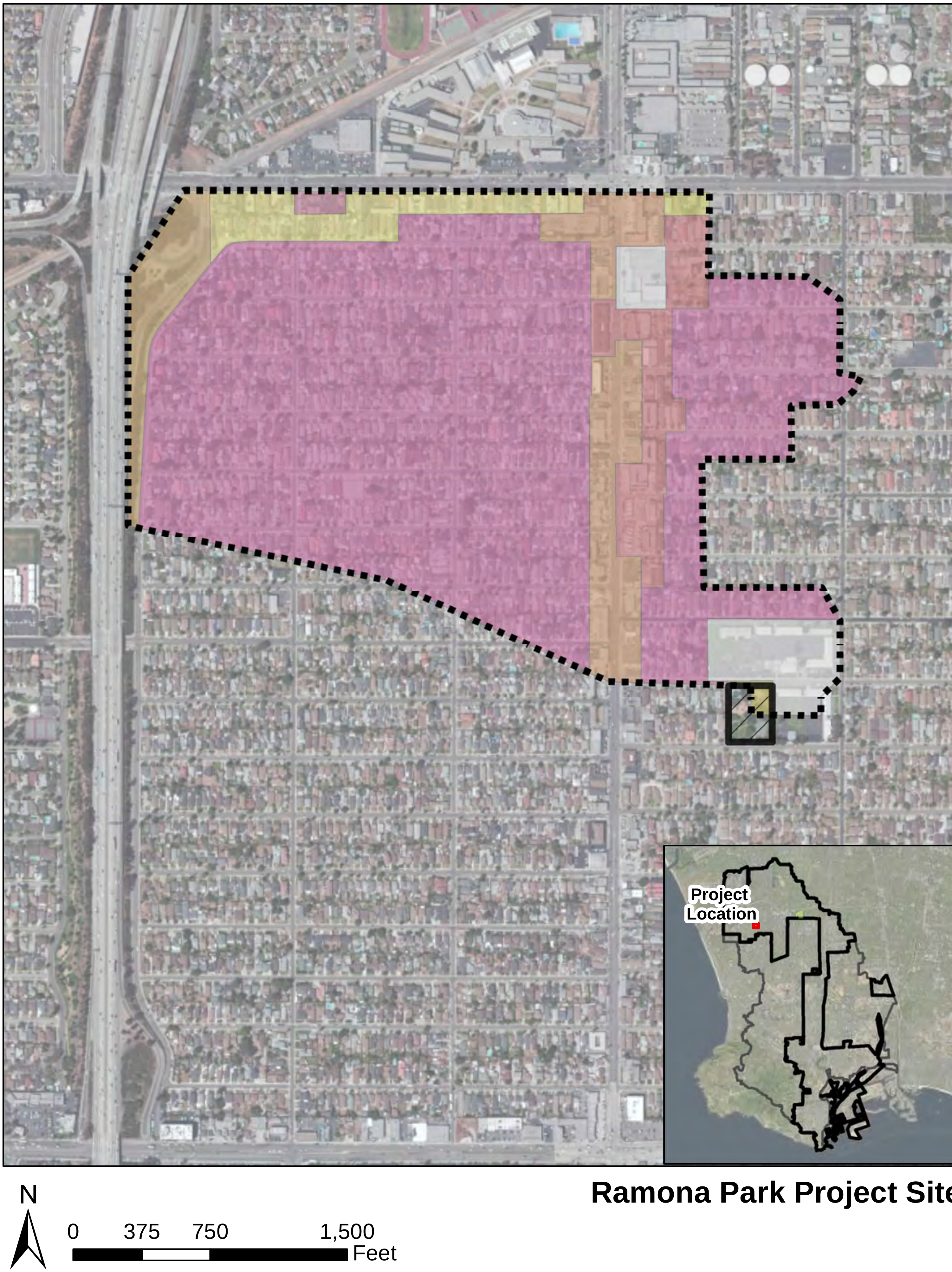

Ramona Park Project Site

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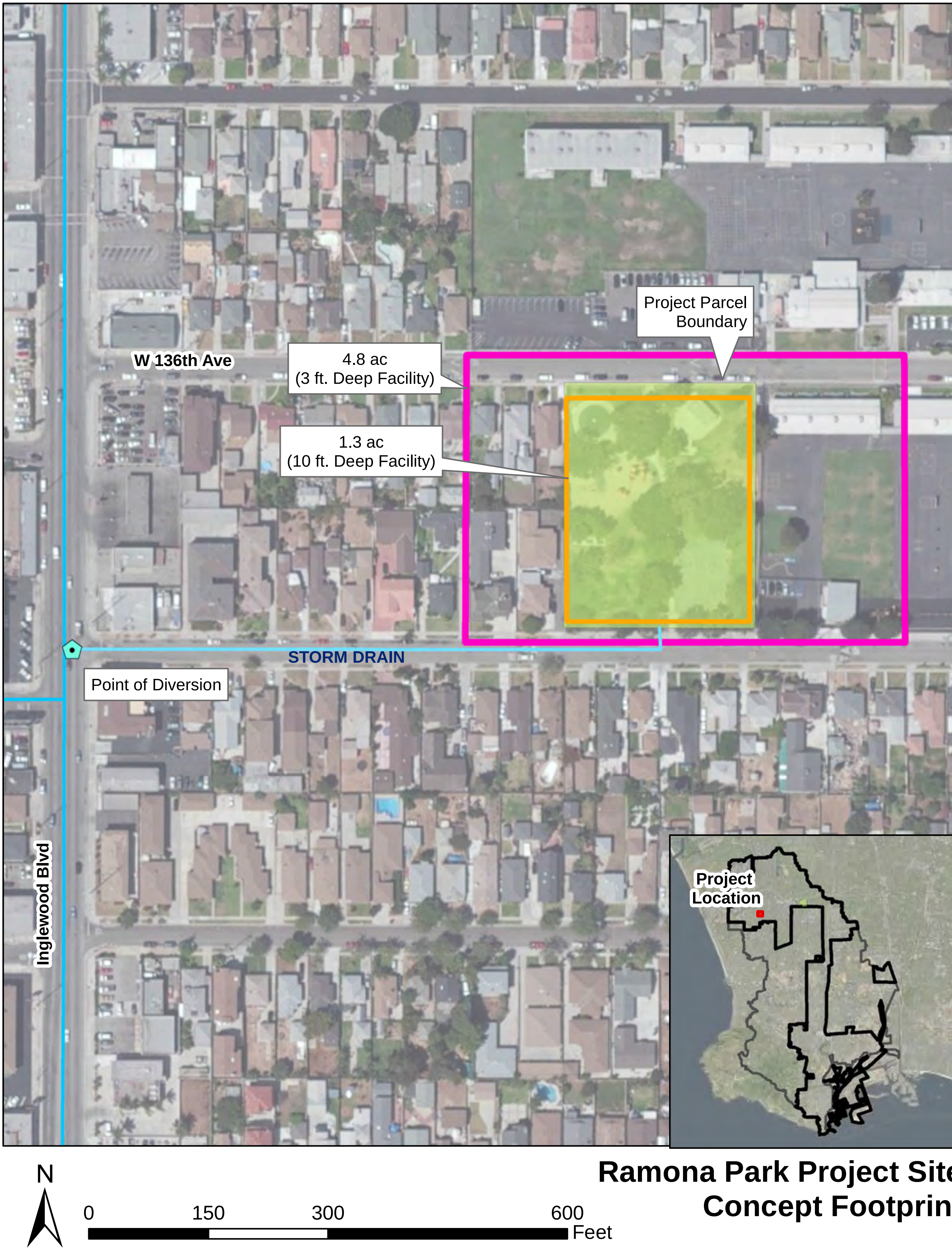

Ramona Park Project Site Concept Footprint

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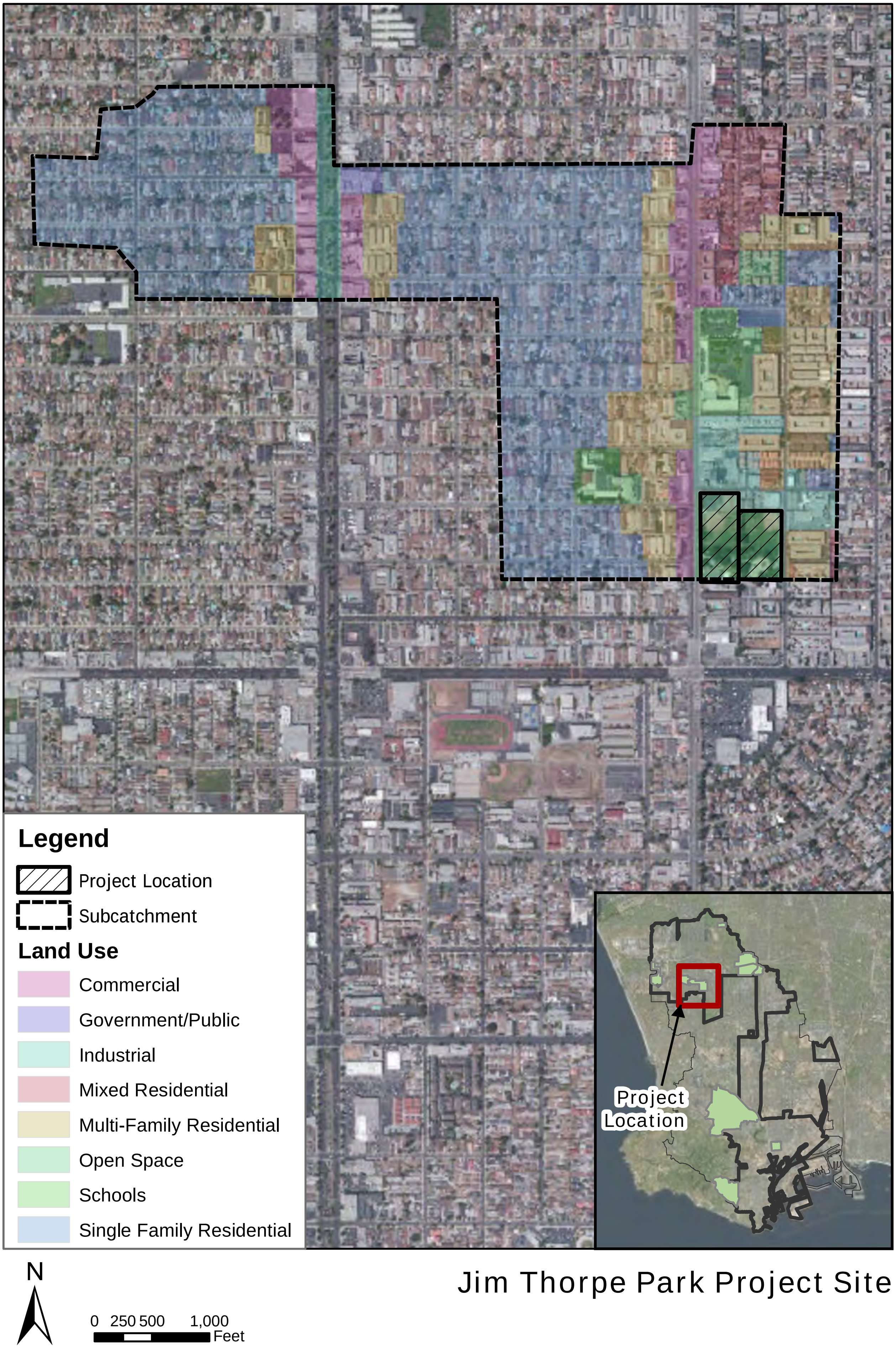

Jim Thorpe Park Project Site

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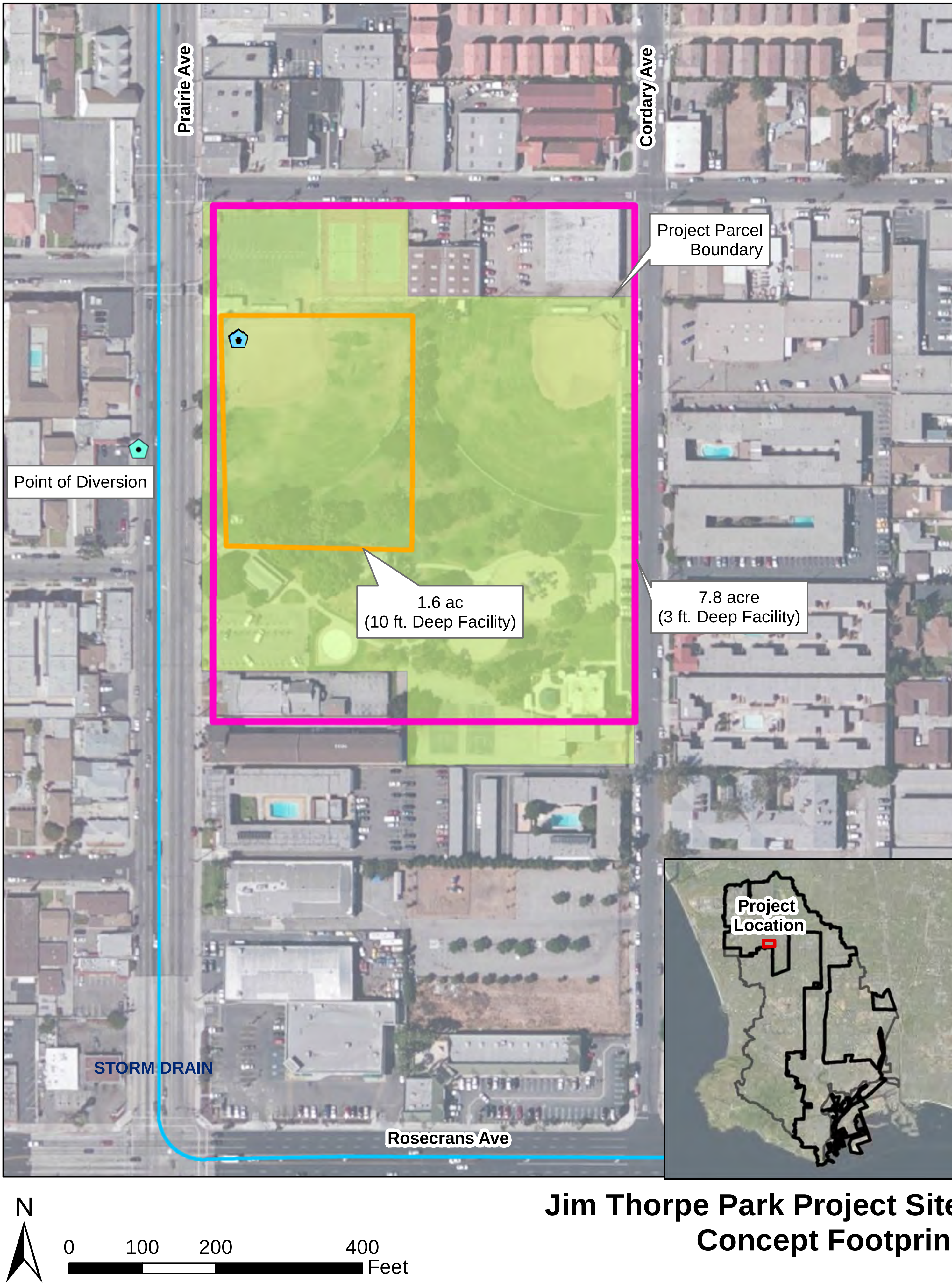

Jim Thorpe Park Project Site Concept Footprint

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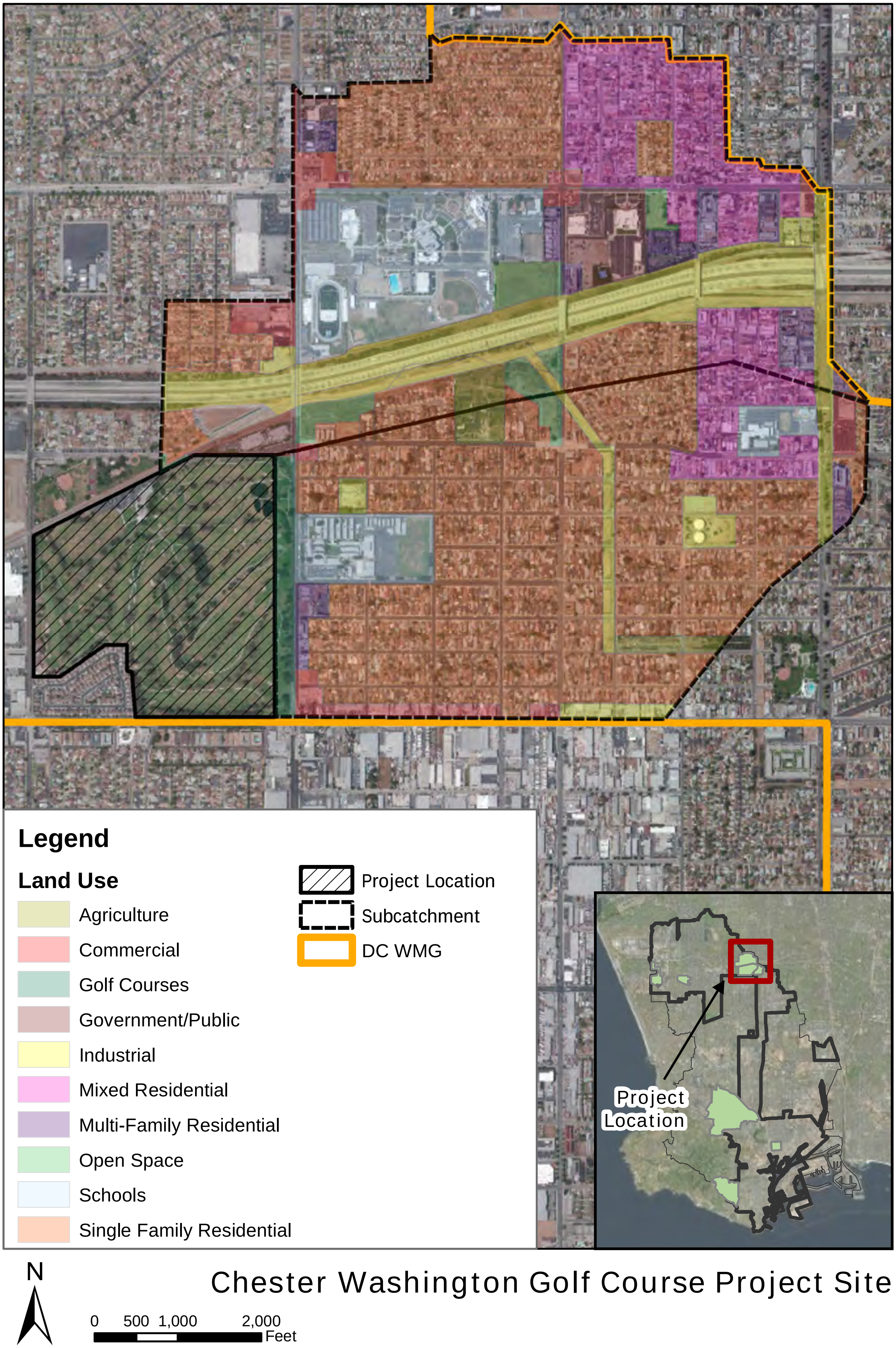

Chester Washington Golf Course Project Site

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Chester Washington Golf Course Project Site
Concept Footprint

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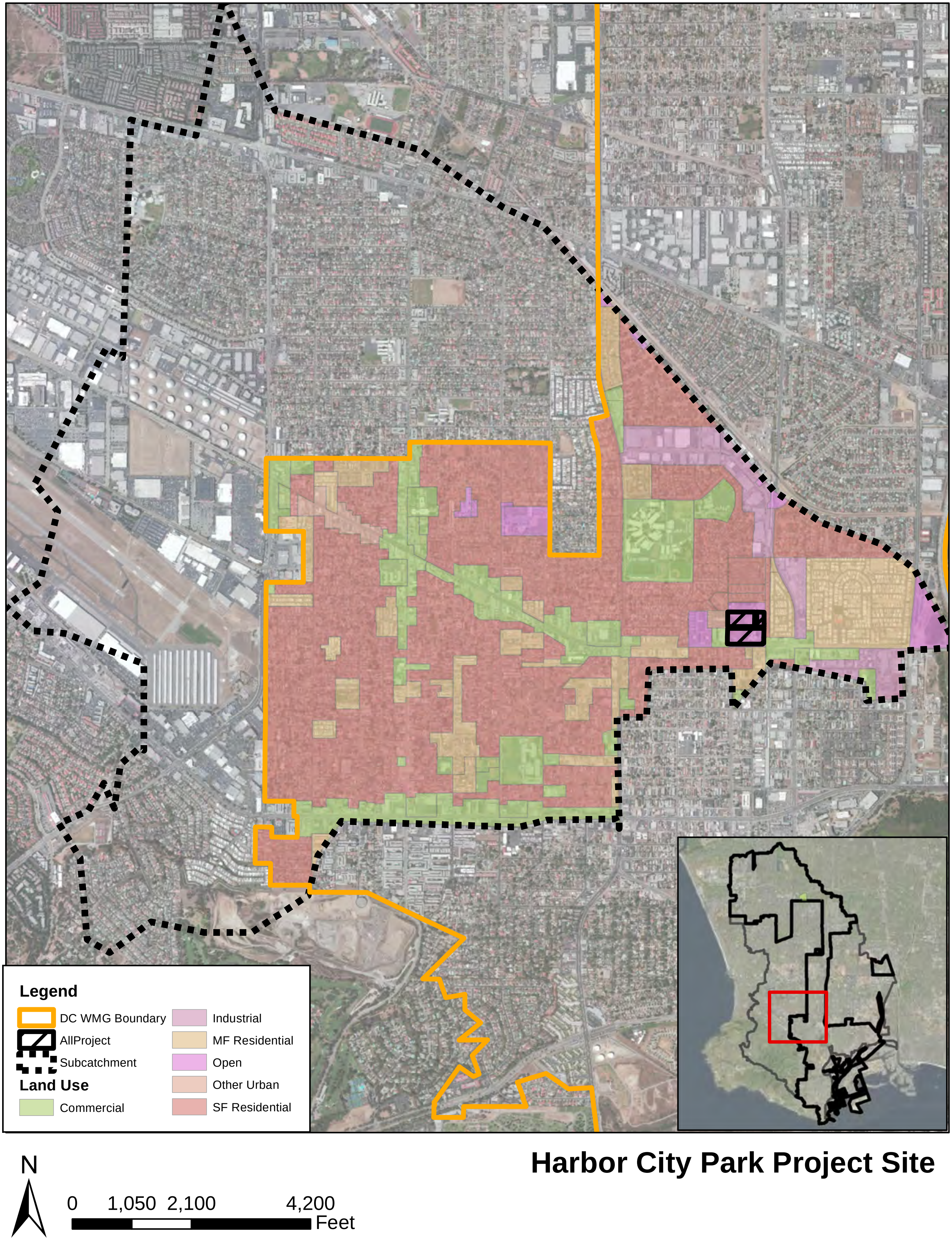

Harbor City Park Project Site

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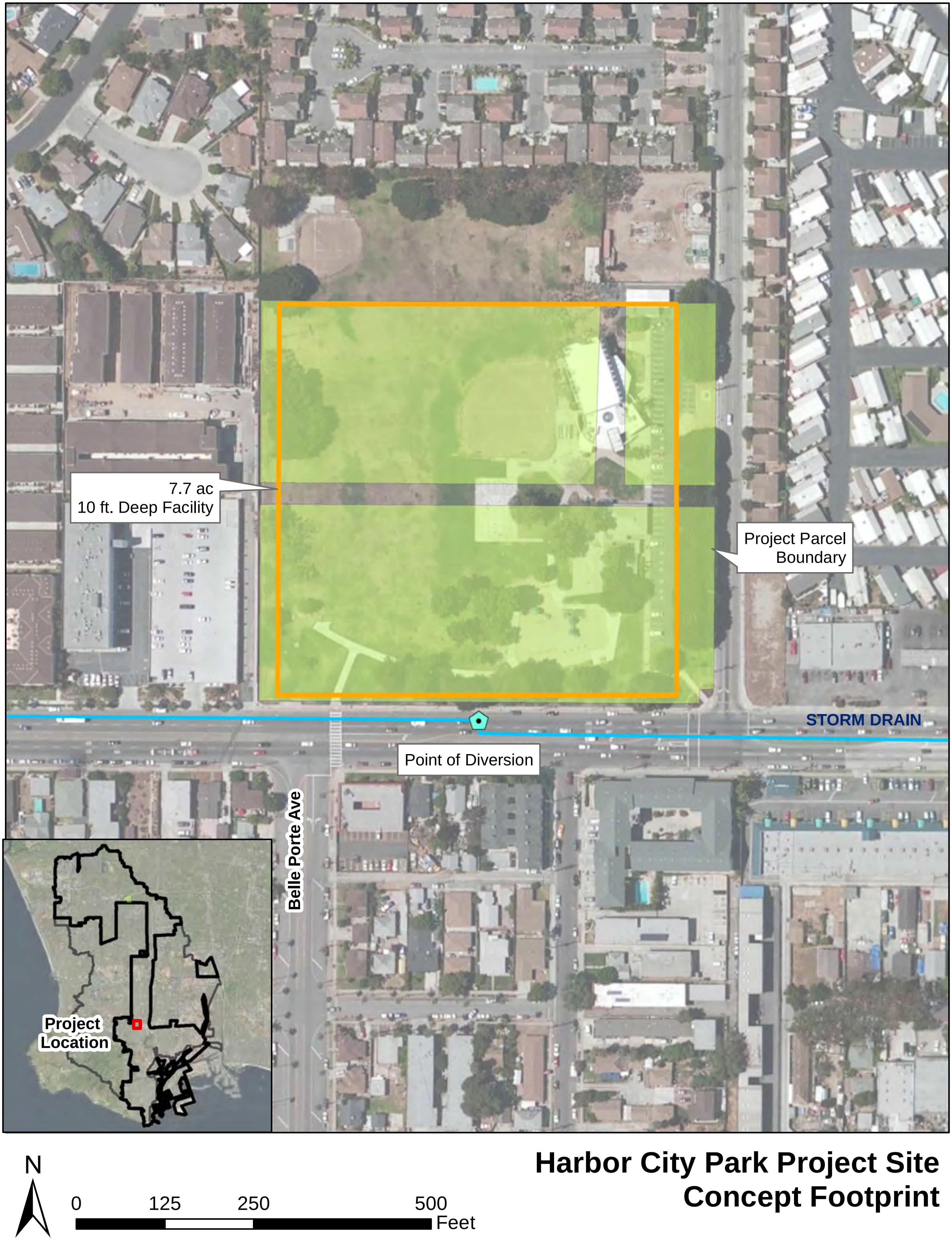

Harbor City Park Project Site Concept Footprint

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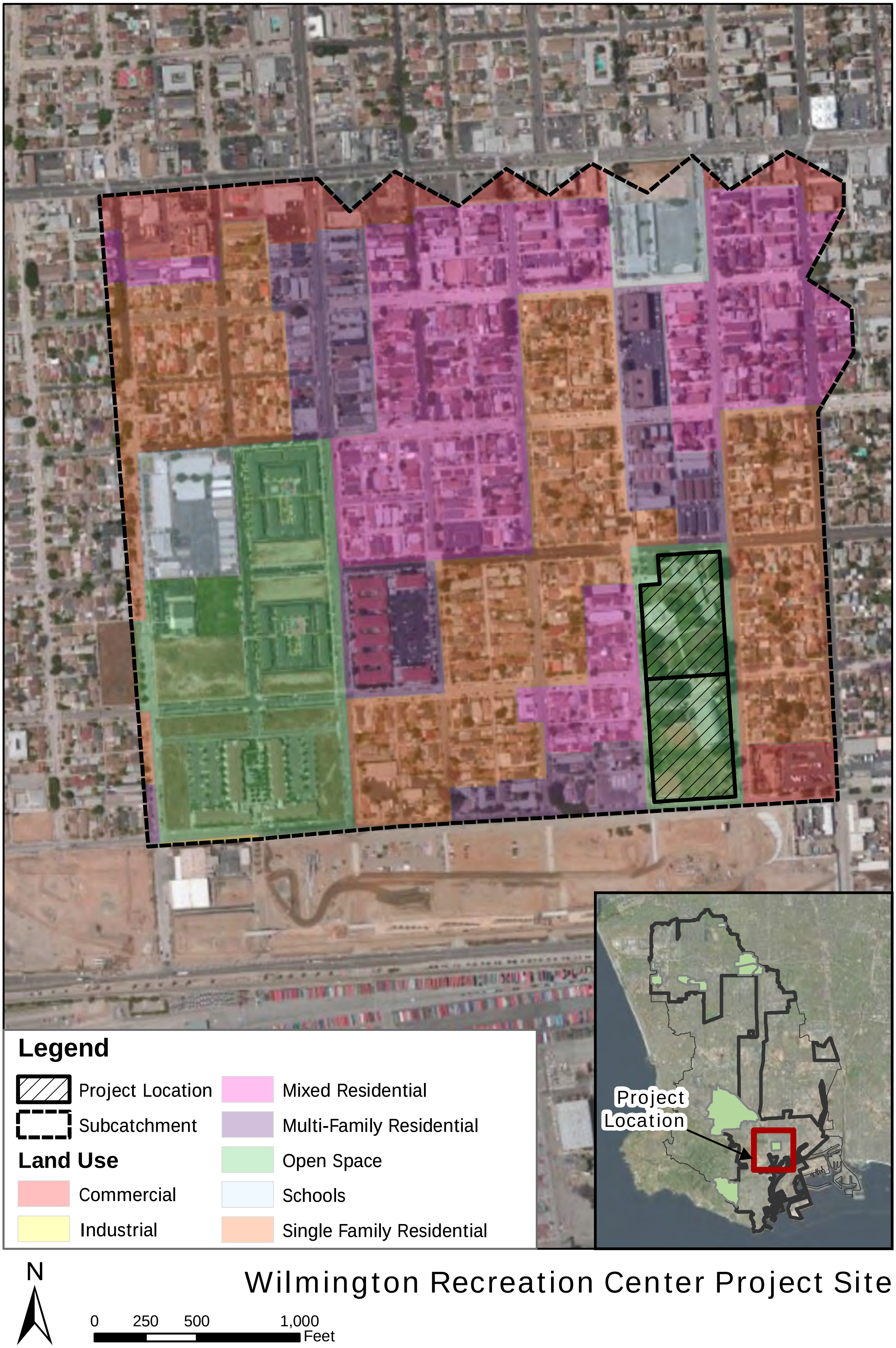

Wilmington Recreation Center Project Site

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Wilmington Recreation Center Project Site Concept Footprint

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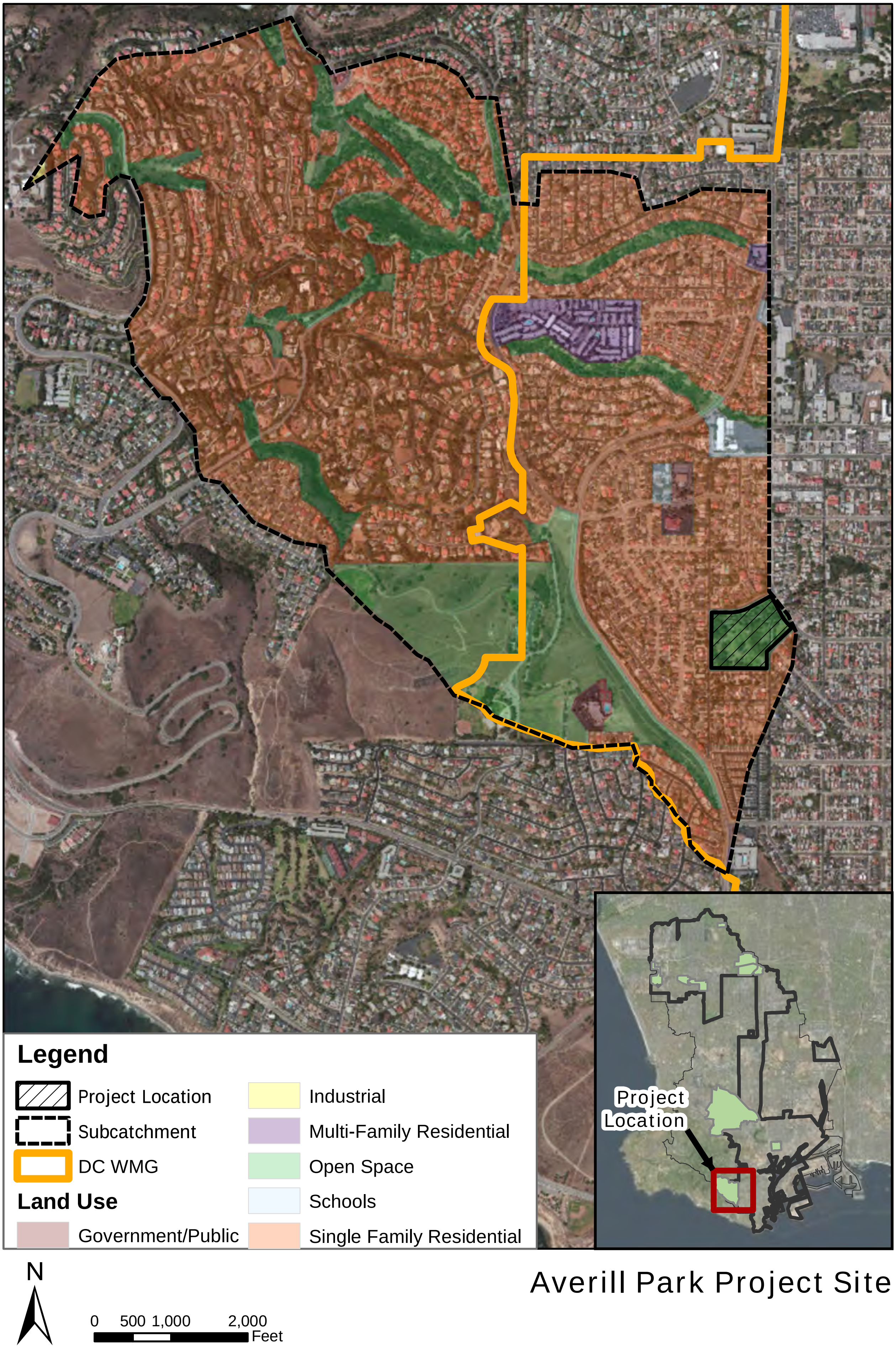

Averill Park Project Site

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Averill Park Project Site
Concept Footprint

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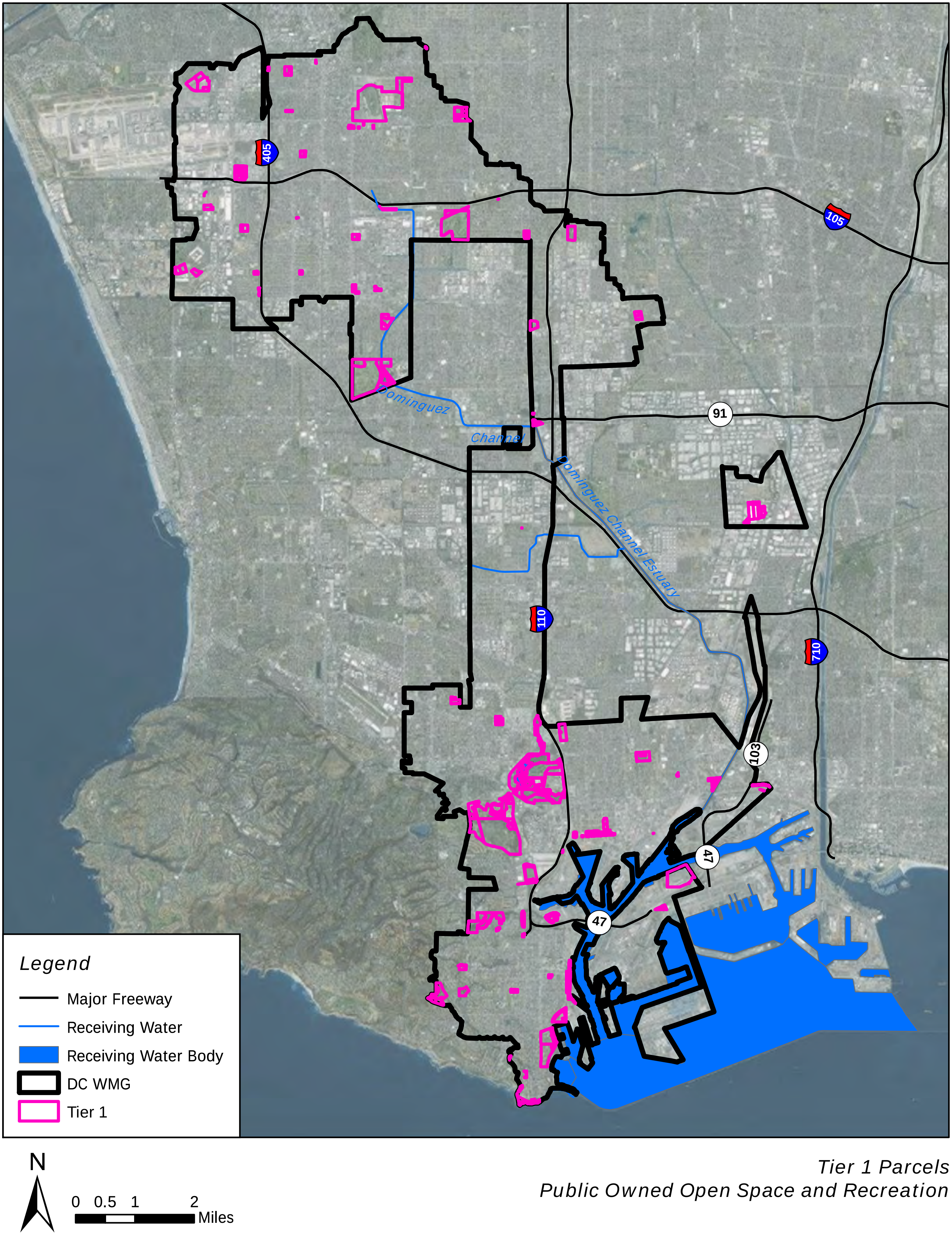

Tier 1 Parcels
Public Owned Open Space and Recreation

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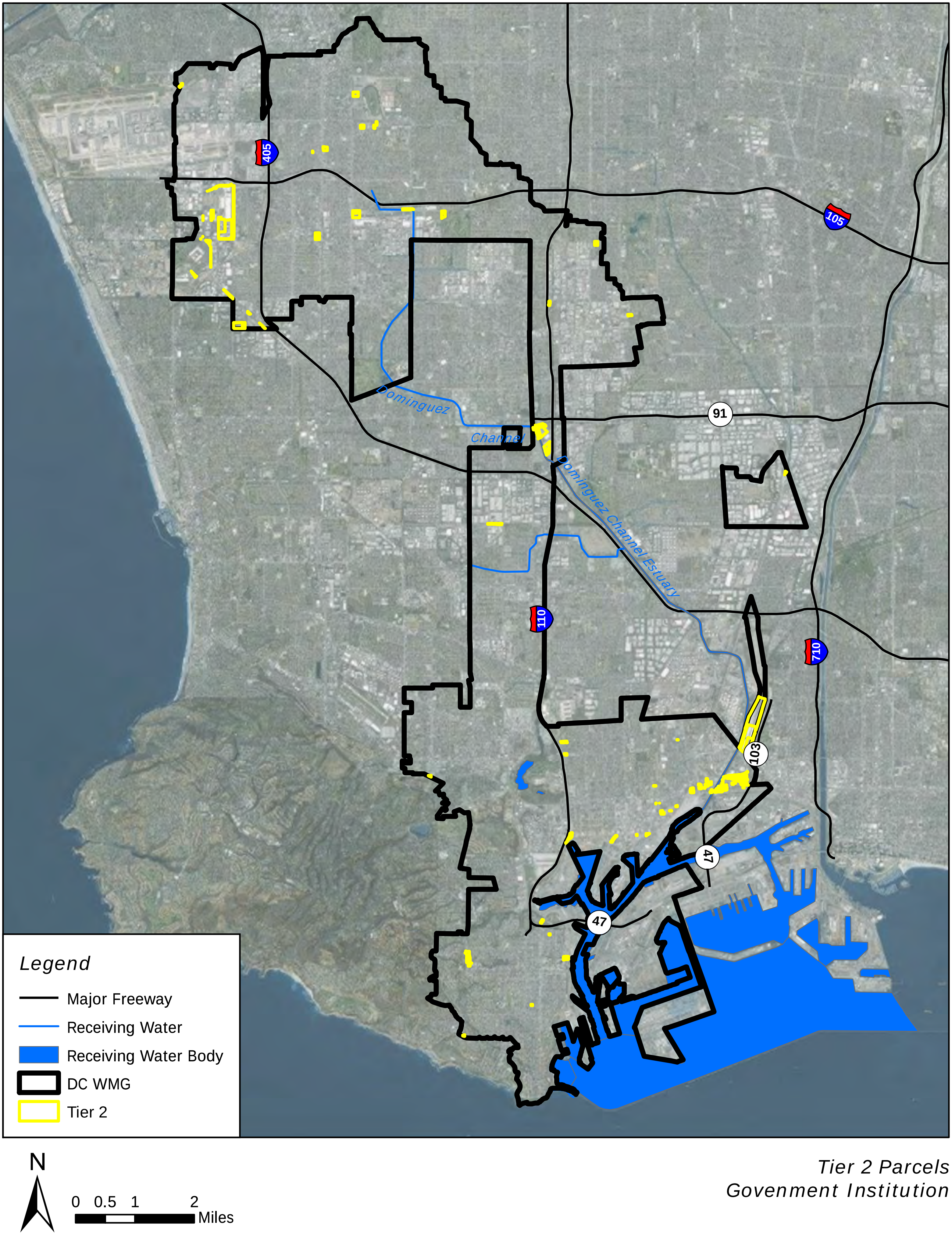

Tier 2 Parcels
Govenment Institution

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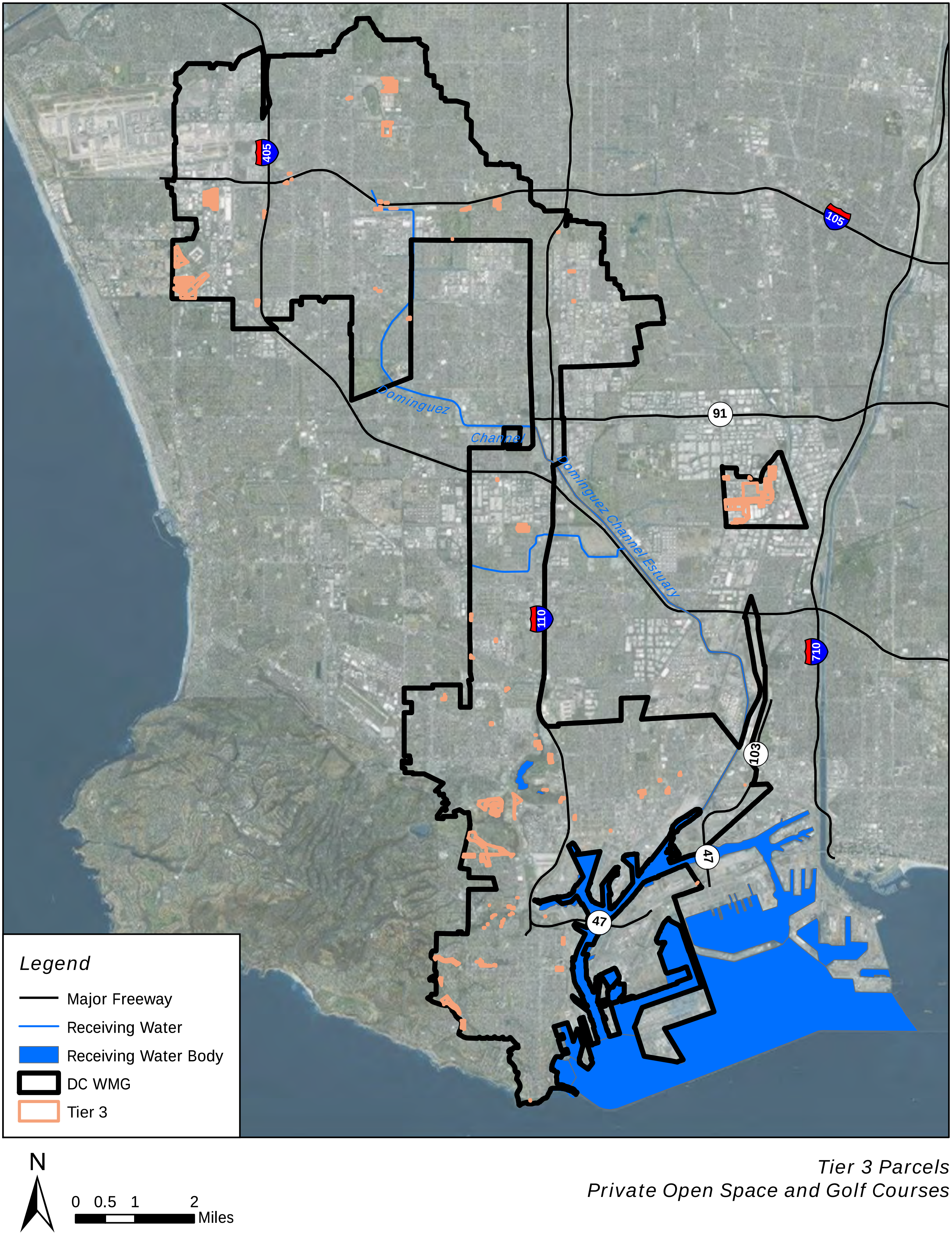

Tier 3 Parcels
Private Open Space and Golf Courses

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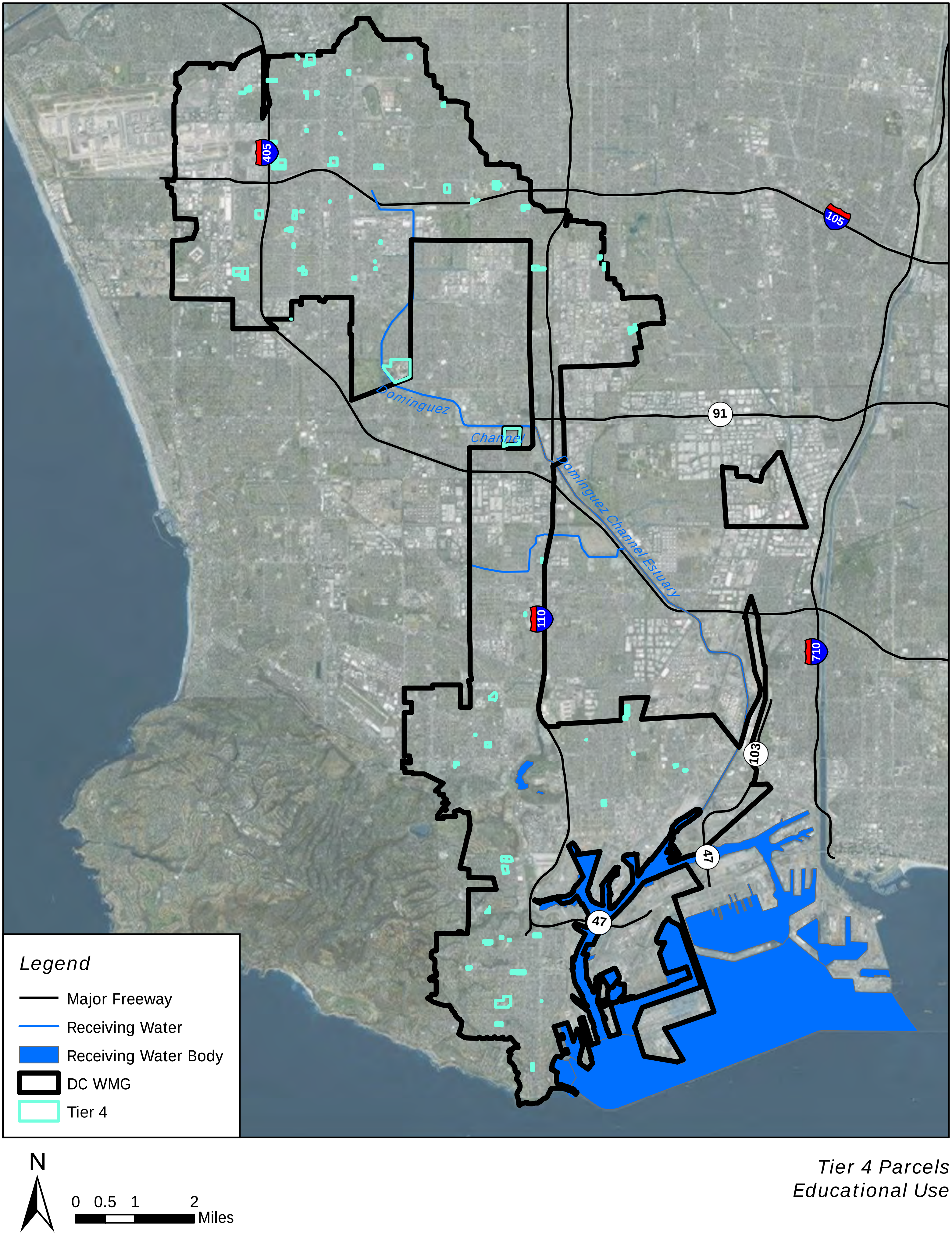

Tier 4 Parcels
Educational Use

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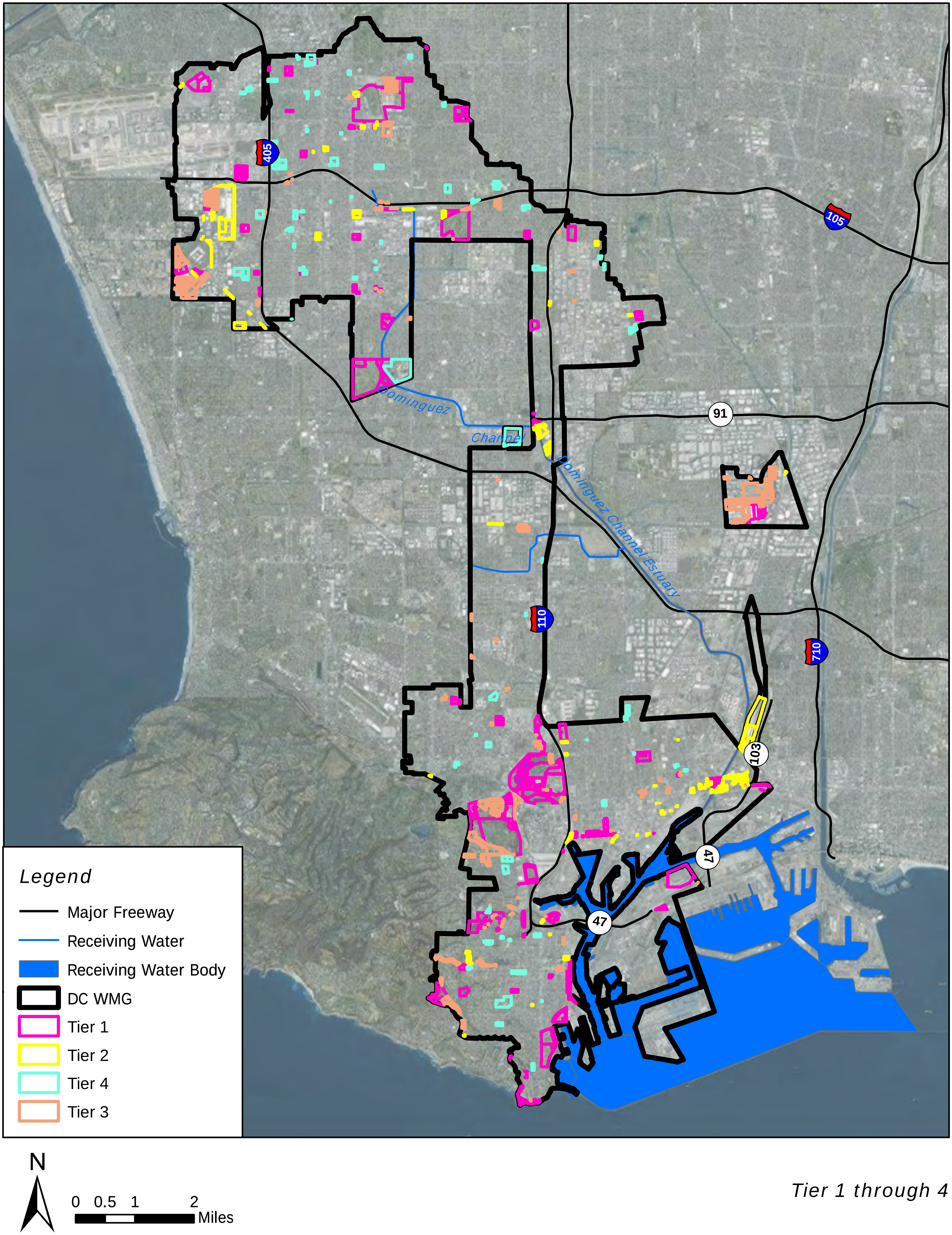

Tier 1 through 4

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Attachment 2: Summary Tables For Each WMG Jurisdiction

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Los Angeles County

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4057032900	**115.98**	**Vacant Undifferentiated**	**46**	**900s**	**1**	**Recommended--Chester Washington Golf Course**	**90.96**	**1930**	**120TH ST**	**County of Los Angeles**	**90047**
4057032910	**0.34**	**Golf Courses**	**40**	**900s**	**1**	**Part of Chester Washington Golf Course - Recommended**	**575.04**			**County of Los Angeles**	
4057032901	**9.60**	**Golf Courses**	**38**	**900s**	**1**	**Part of Chester Washington Golf Course - Recommended**	**65.71**			**County of Los Angeles**	
4071006900	20.16	Developed Local Parks and Recreation	45	900s	1	Bodgar Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself, but may be as large as 40 acres.	21.79			County of Los Angeles	
4057032909	6.73	Developed Local Parks and Recreation	45	900s	1	Holly Park. Area is too small to catch a sizable amount of runoff based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	343.74			County of Los Angeles	
4057032908	3.86	Developed Local Parks and Recreation	45	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	20.24			County of Los Angeles	
6079003906	4.80	Vacant Undifferentiated	44	900s	1	Vacant. Los Angeles Southwest College - privately owned	89.56			County of Los Angeles	
7409022900	3.49	Vacant Undifferentiated	44	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	8.22			County of Los Angeles	
7409009900	1.82	Vacant Undifferentiated	42	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
4037007902	1.84	Developed Local Parks and Recreation	41	900s	1	Lenox Park. Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the 1,200 acrea tributary area.	166.04			County of Los Angeles	
6079003907	1.27	Vacant Undifferentiated	41	900s	1	Los Angeles Southwest College - privately owned	0.75			County of Los Angeles	
4071007903	0.75	Developed Local Parks and Recreation	41	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
4071007904	0.68	Developed Local Parks and Recreation	41	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
4071007902	0.35	Developed Local Parks and Recreation	41	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
4071007901	0.35	Developed Local Parks and Recreation	41	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
7409020900	7.14	Vacant Undifferentiated	40	900s	1	Not Recommended - LACFCD Parcel. Part of a natural water body.	0.00			County of Los Angeles	
4074027908	202.89	Developed Local Parks and Recreation	39	900s	1	Drainage area not within WMG boundary	0.00			County of Los Angeles	
6089028908	2.15	Developed Local Parks and Recreation	39	900s	1	Not recommended--Helen Keller Park. Geotechnical investigations show that on-site storage is not feasible at this site.	318.45			County of Los Angeles	

Los Angeles County

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
6089028905	1.37	Developed Local Parks and Recreation	38	900s	1	Not recommended--Helen Keller Park. Geotechnical investigations show that on-site storage is not feasible at this site.	344.08			County of Los Angeles	
6079002913	1.28	Vacant Undifferentiated	38	900s	1	Los Angeles Southwest College - privately owned	1,742.40			County of Los Angeles	
6089029901	1.17	Developed Local Parks and Recreation	38	900s	1	Not recommended--Helen Keller Park. Geotechnical investigations show that on-site storage is not feasible at this site.	225.03	1045	126TH ST	County of Los Angeles	90044
7318011907	17.69	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
7318011908	13.57	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	3.15			County of Los Angeles	
7318011909	7.81	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	3.85			County of Los Angeles	
4057031906	0.35	Vacant Undifferentiated	37	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,587.90			County of Los Angeles	
4057031907	0.34	Vacant Undifferentiated	37	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,567.02			County of Los Angeles	
4140016948	4.14	Other Open Space and Recreation	36	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,647.98			County of Los Angeles	
6089021901	1.76	Developed Local Parks and Recreation	36	900s	1	Not recommended--Helen Keller Park. Geotechnical investigations show that on-site storage is not feasible at this site.	640.49	1045	126TH ST	County of Los Angeles	90044
7318011910	6.33	Vacant Undifferentiated	35	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
6137005903	0.97	Vacant Undifferentiated	34	900s	1	Roy Campanella Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	58.51			County of Los Angeles	
4034032903	2.47	Police and Sheriff Stations	35	900s	2	Potential	1,374.54			County of Los Angeles	
7409022037	1.23	Vacant Undifferentiated	38		3	Potential	191.77			County of Los Angeles	
6079002805	2.01	Vacant Undifferentiated	37		3	Potential	389.06			County of Los Angeles	
7452030021	3.76	Vacant Undifferentiated	36		3	Potential	343.28			County of Los Angeles	
7318009034	4.78	Vacant Undifferentiated	35		3	Potential	335.72			County of Los Angeles	
4057031800	2.68	Vacant Undifferentiated	35		3	Potential	1,479.87			County of Los Angeles	
6079005026	1.30	Vacant Undifferentiated	35		3	Potential	52.26			County of Los Angeles	
4071018027	0.93	Vacant Undifferentiated	35		3	Potential	686.02			County of Los Angeles	
6079002804	0.38	Vacant Undifferentiated	35		3	Potential	351.56			County of Los Angeles	
7348008044	3.45	Vacant Undifferentiated	34		3	Potential	327.70			County of Los Angeles	

Los Angeles County

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4039017092	2.35	Vacant Undifferentiated	34		3	Potential	935.04			County of Los Angeles	
4057031037	1.25	Vacant Undifferentiated	34		3	Potential	1,371.84			County of Los Angeles	
6079005022	0.94	Vacant Undifferentiated	34		3	Potential	144.22			County of Los Angeles	
6079002081	0.53	Vacant Undifferentiated	34		3	Potential	453.25			County of Los Angeles	
6079005027	0.35	Vacant Undifferentiated	34		3	Potential	1.24			County of Los Angeles	
6079002026	0.28	Vacant Undifferentiated	34		3	Potential	596.50			County of Los Angeles	
6089029031	0.25	Developed Local Parks and Recreation	34		3	Potential	131.55			County of Los Angeles	
7452033031	1.50	Vacant Undifferentiated	33		3	Potential	434.90			County of Los Angeles	
7452033029	1.64	Vacant Undifferentiated	32		3	Potential	764.07			County of Los Angeles	
7409020010	0.83	Vacant Undifferentiated	32		3	Potential	160.47			County of Los Angeles	
7452023001	0.61	Vacant Undifferentiated	32		3	Potential	29.16			County of Los Angeles	
7452024029	0.39	Vacant Undifferentiated	32		3	Potential	0.00			County of Los Angeles	
7452025039	0.33	Vacant Undifferentiated	32		3	Potential	0.00			County of Los Angeles	
6137005036	1.49	Vacant Undifferentiated	31		3	Potential	0.00			County of Los Angeles	
6137035271	1.19	Developed Local Parks and Recreation	31	270-99	3	Potential	33.61			County of Los Angeles	
7452030015	0.88	Vacant Undifferentiated	31		3	Potential	694.97			County of Los Angeles	
6079002029	0.30	Vacant Undifferentiated	31		3	Potential	1,294.31			County of Los Angeles	
7348017001	2.62	Vacant Undifferentiated	30		3	Potential	876.46			County of Los Angeles	
7348017002	0.90	Vacant Undifferentiated	27		3	Potential	1,066.17			County of Los Angeles	
6079002270	3.86	Vacant Undifferentiated	37	270-99	3	Parcel has too high of a percentage of building cover based on visual inspection.	512.04			County of Los Angeles	
4071007053	0.79	Developed Local Parks and Recreation	37		3	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
4071007030	0.35	Developed Local Parks and Recreation	37		3	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
4071007019	0.31	Developed Local Parks and Recreation	37		3	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			County of Los Angeles	
7409020009	10.30	Vacant Undifferentiated	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	123.50			County of Los Angeles	
6079002064	4.75	Vacant Undifferentiated	33		3	Parcel has too high of a percentage of building cover based on visual inspection.	614.84			County of Los Angeles	
7318023075	3.10	Vacant Undifferentiated	33		3	Parcel has too high of a percentage of building cover based on visual inspection.	482.25			County of Los Angeles	
4057031034	0.28	Vacant Undifferentiated	33		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,509.09			County of Los Angeles	
7318009124	6.28	Vacant Undifferentiated	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	475.90			County of Los Angeles	
7318023033	2.54	Vacant Undifferentiated	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	465.34			County of Los Angeles	

Los Angeles County

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
6139010013	0.93	Vacant Undifferentiated	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	65.47			County of Los Angeles	
7318010042	8.71	Developed Local Parks and Recreation	31		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,117.24			County of Los Angeles	
6139010012	0.93	Vacant Undifferentiated	31		3	Parcel has too high of a percentage of building cover based on visual inspection.	210.63			County of Los Angeles	
7318010026	2.30	Vacant Undifferentiated	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,009.29			County of Los Angeles	
4140016165	1.74	Other Open Space and Recreation	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,577.71			County of Los Angeles	
7452032001	0.70	Vacant Undifferentiated	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,068.57			County of Los Angeles	
6132007003	0.47	Vacant Undifferentiated	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	229.45			County of Los Angeles	
7318023044	0.47	Vacant Undifferentiated	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	694.01			County of Los Angeles	
7318010040	0.49	Vacant Undifferentiated	28		3	Parcel has too high of a percentage of building cover based on visual inspection.	477.00			County of Los Angeles	
7318011809	3.33	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	160.40			County of Los Angeles	
6129001052	0.87	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,025.23			County of Los Angeles	
6129001035	0.51	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,072.91			County of Los Angeles	
7318009126	0.50	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,414.30			County of Los Angeles	
6129001051	0.36	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,030.21			County of Los Angeles	
6132017803	1.13	Developed Local Parks and Recreation	26		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,489.72			County of Los Angeles	
6132017805	1.02	Developed Local Parks and Recreation	26		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,450.31			County of Los Angeles	
6132017804	0.46	Developed Local Parks and Recreation	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,595.36			County of Los Angeles	
7318019046	0.35	Vacant Undifferentiated	22		3	Parcel has too high of a percentage of building cover based on visual inspection.	2.82			County of Los Angeles	
6079001904	45.47	College/Universities (Vacant Undifferentiated)	42	900s	4	Los Angeles Southwest College - privately owned	542.98			County of Los Angeles	
6079002918	9.83	College/Universities (Vacant Undifferentiated)	42	900s	4	Los Angeles Southwest College - privately owned	545.82			County of Los Angeles	
4074027907	17.32	Developed Regional Parks and Recreation	40	900s	4	El Camino College - privately owned and open space.	0.00			County of Los Angeles	

Los Angeles County

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
6079002917	4.57	Colleges and Universities	36	900s	4	Parcel is part of a school	548.49			County of Los Angeles	
4074027906	80.94	Colleges and Universities	35	900s	4	Parcel has too high of a percentage of building cover based on visual inspection.	49.24			County of Los Angeles	
4039026900	7.42	Junior or Intermediate High Schools	33	900s	4	Parcel has too high of a percentage of building cover based on visual inspection.	664.90			County of Los Angeles	
4039021900	5.87	Junior or Intermediate High Schools	33	900s	4	Parcel is part of a school	757.62			County of Los Angeles	
6079001905	3.21	Colleges and Universities	32	900s	4	Parcel has too high of a percentage of building cover based on visual inspection.	2,284.07			County of Los Angeles	
4039009902	6.07	Junior or Intermediate High Schools	31	900s	4	Parcel is part of a school	1,633.15			County of Los Angeles	
4039022901	4.38	Junior or Intermediate High Schools	31	900s	4	Parcel is part of a school	1,329.52			County of Los Angeles	
4039020900	0.62	Junior or Intermediate High Schools	31	900s	4	Parcel has too high of a percentage of building cover based on visual inspection.	664.92			County of Los Angeles	
6079002272	0.57	Colleges and Universities	31	270-99	4	Parcel is part of a school	1,892.27			County of Los Angeles	
6079002916	0.27	Colleges and Universities	31	900s	4	Parcel is part of a school	2,186.33			County of Los Angeles	
6079002271	1.71	Colleges and Universities	30	270-99	4	Parcel is part of a school	1,875.73			County of Los Angeles	
6130015902	9.77	Junior or Intermediate High Schools	29	900s	4	Parcel is part of a school	313.82			County of Los Angeles	
4039023900	1.35	Junior or Intermediate High Schools	28	900s	4	Parcel is part of a school	1,486.91			County of Los Angeles	
6130015900	1.78	Junior or Intermediate High Schools	26	900s	4	Parcel is part of a school	338.52			County of Los Angeles	
6130015901	1.57	Junior or Intermediate High Schools	23	900s	4	Parcel is part of a school	896.51			County of Los Angeles	

City of Los Angeles

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7560023900	**10.75**	**Developed Local Parks and Recreation**	**42**	**900s**	**1**	**Recommended - Averill Park**	**0.00**			**Los Angeles CA**	
7439027902	**2.97**	**Developed Local Parks and Recreation**	**38**	**900s**	**1**	**Recommended - Harbor City Park**	**1,988.97**			**Los Angeles CA**	
7439027904	**2.80**	**Developed Local Parks and Recreation**	**38**	**900s**	**1**	**Recommended - Harbor City Park**	**1,901.09**			**Los Angeles CA**	
7439027900	**1.75**	**Developed Local Parks and Recreation**	**37**	**900s**	**1**	**Recommended - Harbor City Park**	**1,865.24**			**Los Angeles CA**	
7439027906	**0.75**	**Developed Local Parks and Recreation**	**36**	**900s**	**1**	**Recommended - Harbor City Park**	**2,403.39**			**Los Angeles CA**	
7439027903	**1.10**	**Developed Local Parks and Recreation**	**37**	**900s**	**1**	**Recommended - Harbor City Park. Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.**	**2,432.18**	**1309**	**LOMITA BLVD**	**Los Angeles CA**	**90717**
7417020900	**3.76**	**Developed Local Parks and Recreation**	**38**	**900s**	**1**	**Recommended- Part of Wilmington Recreation Center. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**0.00**			**Los Angeles CA**	
7417021900	**3.55**	**Developed Local Parks and Recreation**	**38**	**900s**	**1**	**Recommended- Part of Wilmington Recreation Center. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**2.98**			**Los Angeles CA**	
7417001903	0.27	Vacant Undifferentiated	43	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	380.63			Los Angeles CA	
7417001910	0.28	Vacant Undifferentiated	42	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	433.30	251	MAR VISTA AVE	Los Angeles CA	90744
7417001915	0.42	Vacant Undifferentiated	39	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	185.61	221	MAR VISTA AVE	Los Angeles CA	90744
7417001904	0.30	Vacant Undifferentiated	38	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	264.08			Los Angeles CA	
7418036900	0.43	Vacant Undifferentiated	35	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	825.51	501	B ST	Los Angeles CA	95648
7417018919	0.43	Vacant Undifferentiated	35	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	34.84			Los Angeles CA	
7417018917	0.43	Vacant Undifferentiated	35	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	34.84			Los Angeles CA	
7417008902	0.29	Vacant Undifferentiated	35	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	960.59	1109	HARRY BRIDGES BLVD	Los Angeles CA	90744
7417019925	1.69	Vacant Undifferentiated	34	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	427.53	628	C ST	Los Angeles CA	90744
7418036901	1.27	Vacant Undifferentiated	34	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	561.50			Los Angeles CA	
7417019924	1.17	Vacant Undifferentiated	34	900s	1	Part of Wilmington Recreation Center/Park--can be used	597.54	601	B ST	Los Angeles CA	95648

City of Los Angeles

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
						as a substitute					
7417018918	0.42	Vacant Undifferentiated	34	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	205.22			Los Angeles CA	
7417018916	0.42	Vacant Undifferentiated	34	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	205.21			Los Angeles CA	
7417019916	0.29	Vacant Undifferentiated	34	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	201.29	221	BAY VIEW AVE	Los Angeles CA	90744
7417018900	0.89	Vacant Undifferentiated	33	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	591.53			Los Angeles CA	
7417018901	0.86	Vacant Undifferentiated	33	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	431.19			Los Angeles CA	
7417018907	0.37	Vacant Undifferentiated	33	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	597.23			Los Angeles CA	
7417018908	0.36	Vacant Undifferentiated	33	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	431.23	221	GULF AVE	Los Angeles CA	90744
7418035908	0.28	Vacant Undifferentiated	32	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	603.35	216	LAGOON AVE	Los Angeles CA	90744
7418036902	0.35	Vacant Undifferentiated	31	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	829.35	217	LAGOON AVE	Los Angeles CA	90744
7417009905	0.33	Vacant Undifferentiated	30	900s	1	Part of Wilmington Recreation Center/Park--can be used as a substitute	1,002.76	1032	C ST	Los Angeles CA	90744
6121019904	9.23	Bus Terminals and Yards	39	900s	2	Potential	110.70	731	182ND ST	Los Angeles CA	90248
6121020906	4.78	Bus Terminals and Yards	39	900s	2	Potential	125.59			Los Angeles CA	
7351019904	2.89	Electrical Power Facilities	38	900s	2	Potential	655.43			Los Angeles CA	
7414022902	1.75	Other Special Use Facilities	38	900s	2	Potential	416.55			Los Angeles CA	
6121018906	2.65	Bus Terminals and Yards	37	900s	2	Potential	105.02			Los Angeles CA	
6121020905	2.00	Bus Terminals and Yards	37	900s	2	Potential	130.09			Los Angeles CA	
7455027932	1.46	Other Special Use Facilities	37	900s	2	Potential	40.53			Los Angeles CA	
7424024901	0.33	Open Storage	37	900s	2	Potential	206.04			Los Angeles CA	
6121020908	1.59	Bus Terminals and Yards	36	900s	2	Potential	125.87			Los Angeles CA	
7440006937	1.54	Open Storage	36	900s	2	Potential	424.85			Los Angeles CA	
7440006927	1.54	Open Storage	36	900s	2	Potential	424.85			Los Angeles CA	
6121018905	1.20	Bus Terminals and Yards	36	900s	2	Potential	144.61			Los Angeles CA	
7428026939	0.89	Open Storage	35	900s	2	Potential	99.14			Los Angeles CA	
7428026938	0.89	Open Storage	35	900s	2	Potential	99.14			Los Angeles CA	
6121019905	0.59	Bus Terminals and Yards	35	900s	2	Potential	133.10			Los Angeles CA	
7428025905	0.44	Open Storage	34	900s	2	Potential	279.18			Los Angeles CA	
7428025918	0.33	Open Storage	34	900s	2	Potential	312.61			Los Angeles CA	
7428021917	0.33	Open Storage	34	900s	2	Potential	309.91			Los Angeles CA	
7428021921	0.33	Open Storage	34	900s	2	Potential	309.91			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4124002916	1.05	Other Public Facilities	31	900s	2	Potential	455.20			Los Angeles CA	
7414023902	0.63	Park-and-Ride Lots	30	900s	2	Potential	614.60	1345	PACIFIC COAST HWY	Los Angeles CA	90744
7448025900	0.90	Non-Attended Public Parking Facilities	21	900s	2	Potential	1,434.21			Los Angeles CA	
7454022900	**3.59**	**Developed Local Parks and Recreation**	**36**	**900s**	**1**	**Viable Alternative - Daniels Field Sports Center. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**2,145.02**			**Los Angeles CA**	
7462026900	**1.32**	**Developed Local Parks and Recreation**	**34**	**900s**	**1**	**Viable Alternative - Alma Park. Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.**	**1,428.06**			**Los Angeles CA**	
7446019901	**1.14**	**Developed Local Parks and Recreation**	**34**	**900s**	**1**	**Viable alternative - Rena Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**1,185.75**			**Los Angeles CA**	
7438017904	9.50	Vacant Undifferentiated	46	900s	1	Entirely paved based on visual inspection.	370.04			Los Angeles CA	
7351034901	5.93	Vacant Undifferentiated	46	900s	1	Area too small to use based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	44.38			Los Angeles CA	
7440016907	16.13	Vacant Undifferentiated	43	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	0.00			Los Angeles CA	
7445018900	6.99	Vacant Undifferentiated	42	900s	1	Near watershed jurisdiction boundary and would most likely receive runoff from outside of jurisdiction. Also, site has steep terrain and is mostly paved based on visual inspections. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	87.09	1214	PARK WESTERN PL	Los Angeles CA	90732
4037005900	3.59	Developed Local Parks and Recreation	42	900s	1	Lenox Park. Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the 1,200 acrea tributary area.	334.01	10828	CONDON AVE	LENNOX CA	90304
7440020910	4.97	Vacant Undifferentiated	41	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	40.48			Los Angeles CA	
7428027900	4.87	Vacant Undifferentiated	41	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
7438017903	0.93	Vacant Undifferentiated	41	900s	1	Entirely paved based on visual inspection.	174.94			Los Angeles CA	
7412015900	76.21	Developed Regional Parks and Recreation	40	900s	1	Part of Harbor Lake	0.00			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7440005921	47.79	Vacant Undifferentiated	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	0.00	195	MC FARLAND AVE	Los Angeles CA	90733
7440036907	36.97	Developed Local Parks and Recreation	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	177.34			Los Angeles CA	
7440035904	23.54	Other Open Space and Recreation	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	120.97			Los Angeles CA	
7422017900	21.09	Developed Local Parks and Recreation	40	900s	1	Banning Park. Only on-site runoff can be treated, which will be occuring anyway.	1,575.91	415	M ST	WILMINGTON CA	90744
7414002903	18.75	Developed Local Parks and Recreation	40	900s	1	Only on-site runoff can be treated, which will be occuring anyway.	0.00	1700	FIGUEROA ST	Los Angeles CA	90015
7440030906	11.71	Developed Local Parks and Recreation	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	152.83			Los Angeles CA	
7440036906	11.63	Developed Local Parks and Recreation	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	198.54			Los Angeles CA	
7440036904	8.53	Other Open Space and Recreation	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	0.00			Los Angeles CA	
7347004901	7.98	Developed Local Parks and Recreation	40	900s	1	Normandal Recreation Center. Would receive mostly runoff from outside watershed jurisdiction boundary based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,465.39			Los Angeles CA	
7440021910	4.18	Vacant Undifferentiated	40	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	373.61			Los Angeles CA	
7425023910	0.56	Developed Local Parks and Recreation	40	900s	1	Entirely paved based on visual inspection.	30.08			Los Angeles CA	
7412010903	160.41	Developed Regional Parks and Recreation	39	900s	1	Part of Harbor Lake	0.00	25860	VERMONT AVE	Los Angeles CA	90710
7412012902	64.88	Vacant Undifferentiated	39	900s	1	Part of Harbor Lake	213.28	1111	FIGUEROA TER	Los Angeles CA	90012
7412011900	45.19	Developed Regional Parks and Recreation	39	900s	1	Part of Harbor Lake	0.00	26300	VERMONT AVE	HARBOR CITY CA	90710

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7442001915	41.52	Base Developed Local Parks and Recreation	39	900s	1	Being Developed	85.34			Los Angeles CA	
7412026916	10.51	Developed Local Parks and Recreation	39	900s	1	Only on-site runoff can be treated, which will be occuring anyway.	0.00			Los Angeles CA	
7412014900	9.90	Developed Regional Parks and Recreation	39	900s	1	Part of Harbor Lake	159.60			Los Angeles CA	
7440031910	7.22	Developed Local Parks and Recreation	39	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	531.63			Los Angeles CA	
7440031911	7.22	Developed Local Parks and Recreation	39	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	531.63			Los Angeles CA	
7412012900	5.38	Vacant Undifferentiated	39	900s	1	Part of Harbor Lake	152.71			Los Angeles CA	
4129037909	4.05	Vacant Undifferentiated	39	900s	1	Being developed.	160.65	5761	IMPERIAL HWY	Los Angeles CA	90045
6079006904	2.63	Vacant Undifferentiated	39	900s	1	Los Angeles Southwest College - privately owned	329.75	1302	IMPERIAL HWY	Los Angeles CA	90044
7452030901	2.46	Vacant Undifferentiated	39	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	311.29			Los Angeles CA	
7440020906	2.30	Vacant Undifferentiated	39	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	80.79			Los Angeles CA	
7440030918	2.14	Developed Local Parks and Recreation	39	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	61.01			Los Angeles CA	
7440030921	2.14	Developed Local Parks and Recreation	39	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	61.01			Los Angeles CA	
7455025900	1.71	Developed Local Parks and Recreation	39	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	24.86			Los Angeles CA	
7440005938	1.18	Vacant Undifferentiated	39	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	361.62			Los Angeles CA	
7440005920	0.90	Vacant Undifferentiated	39	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	135.85			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7440034901	71.24	Developed Local Parks and Recreation	38	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	492.31			Los Angeles CA	
7440011908	54.57	Other Open Space and Recreation	38	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	529.37			Los Angeles CA	
7440037903	39.63	Other Open Space and Recreation	38	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	460.32			Los Angeles CA	
4129037906	3.61	Vacant Undifferentiated	38	900s	1	Being developed.	39.70			Los Angeles CA	
7413023900	3.25	Vacant Undifferentiated	38	900s	1	Part of Harbor Lake	0.00			Los Angeles CA	
7428026912	1.62	Vacant Undifferentiated	38	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
6121017900	1.35	Vacant Undifferentiated	38	900s	1	Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	0.00			Los Angeles CA	
6121018902	1.34	Vacant Undifferentiated	38	900s	1	Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	0.00			Los Angeles CA	
6121018900	1.22	Vacant Undifferentiated	38	900s	1	Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	0.00			Los Angeles CA	
7429013923	1.14	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	46.34			Los Angeles CA	
7429013922	1.14	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	46.34			Los Angeles CA	
7429013916	1.11	Vacant Undifferentiated	38	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
7429013917	1.11	Vacant Undifferentiated	38	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
7440030910	1.08	Developed Local Parks and Recreation	38	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	26.44			Los Angeles CA	
7440031905	1.03	Developed Local Parks and Recreation	38	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	2,240.61			Los Angeles CA	
7446001900	0.80	Developed Local Parks and Recreation	38	900s	1	Built-out in parts the other parcels are part of a natural drainage that appears to be very steep.	63.64			Los Angeles CA	
7440005932	0.71	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	361.62			Los Angeles CA	

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7446001901	63.79	Developed Local Parks and Recreation	37	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself. Parcel has a probability of landslides occurence.	0.00			Los Angeles CA	
7469018904	36.49	Developed Local Parks and Recreation	37	900s	1	Drains to ocean.	1,352.03			Los Angeles CA	
7412012903	20.46	Vacant Undifferentiated	37	900s	1	Part of Harbor Lake	418.81	1700	L ST	Los Angeles CA	90744
6057010901	13.73	Developed Regional Parks and Recreation	37	900s	1	Maggie Hathaway Gold Coarse and Jesse Ownes Coubnty Park - only on-site runoff can be treated, which will be occuring anyway.	2,008.94	9637	WESTERN AVE	Los Angeles CA	90047
6119025900	10.55	Developed Local Parks and Recreation	37	900s	1	Only on-site runoff can be treated, which will be occuring anyway.	2,073.24			Los Angeles CA	
7447024900	9.05	Developed Local Parks and Recreation	37	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	116.78			Los Angeles CA	
7561025902	7.96	Developed Regional Parks and Recreation	37	900s	1	Excluded because located on watershed jurisdiction boundary. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,068.04			Los Angeles CA	
6057010902	7.54	Developed Regional Parks and Recreation	37	900s	1	Maggie Hathaway Gold Coarse and Jesse Ownes Coubnty Park - only on-site runoff can be treated, which will be occuring anyway.	1,437.98			Los Angeles CA	
6057010903	7.19	Developed Regional Parks and Recreation	37	900s	1	Maggie Hathaway Gold Coarse and Jesse Ownes County Park - only on-site runoff can be treated, which will be occuring anyway.	1,543.68	9651	WESTERN AVE	Los Angeles CA	90047
7447003900	6.79	Vacant Undifferentiated	37	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	158.15			Los Angeles CA	
4129037910	2.78	Vacant Undifferentiated	37	900s	1	Being developed.	58.57			Los Angeles CA	
4129037912	2.69	Vacant Undifferentiated	37	900s	1	Being developed.	41.68			Los Angeles CA	
4129037908	2.52	Vacant Undifferentiated	37	900s	1	Being developed.	159.21			Los Angeles CA	
4129037915	2.26	Vacant Undifferentiated	37	900s	1	Being developed.	25.79			Los Angeles CA	
7429013920	1.38	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	250.55			Los Angeles CA	
7429013921	1.38	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	250.55			Los Angeles CA	
7440030908	0.96	Developed Local Parks and Recreation	37	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	116.12			Los Angeles CA	

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7440002906	0.65	Vacant Undifferentiated	37	900s	1	Entirely paved based on visual inspection.	139.99			Los Angeles CA	
7440030911	0.65	Developed Local Parks and Recreation	37	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	71.63			Los Angeles CA	
7440030919	0.65	Developed Local Parks and Recreation	37	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	71.63			Los Angeles CA	
7428028966	0.62	Vacant Undifferentiated	37	900s	1	Entirely paved based on visual inspection.	115.14			Los Angeles CA	
7440030920	0.62	Developed Local Parks and Recreation	37	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	56.68			Los Angeles CA	
7428028944	0.54	Vacant Undifferentiated	37	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
6079005901	0.48	Vacant Undifferentiated	37	900s	1	Los Angeles Southwest Colledge - privately owned	297.81	1302	IMPERIAL HWY	Los Angeles CA	90044
7440030917	0.48	Developed Local Parks and Recreation	37	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	115.84			Los Angeles CA	
7440002915	0.42	Vacant Undifferentiated	37	900s	1	Entirely paved based on visual inspection.	139.99			Los Angeles CA	
7428026910	0.36	Vacant Undifferentiated	37	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
7440005912	0.29	Vacant Undifferentiated	37	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	543.82			Los Angeles CA	
7428028922	0.26	Vacant Undifferentiated	37	900s	1	Entirely paved based on visual inspection.	101.17			Los Angeles CA	
7440040906	40.59	Developed Local Parks and Recreation	36	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	52.69			Los Angeles CA	
7560028900	28.67	Developed Regional Parks and Recreation	36	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	283.79	1805	9TH ST	Los Angeles CA	90006
4123018928	24.62	Developed Local Parks and Recreation	36	900s	1	Entirely paved based on visual inspection.	0.00	9029	AIRPORT BLVD	Los Angeles CA	90009
4123018927	18.13	Developed Local Parks and Recreation	36	900s	1	Entirely paved based on visual inspection.	0.00			Los Angeles CA	
6057010900	3.54	Developed Regional Parks and Recreation	36	900s	1	Maggie Hathaway Gold Coarse and Jesse Ownes Coubnty Park - only on-site runoff can be treated, which will be occuring anyway.	2,433.68	1850	96TH ST	Los Angeles CA	90047
7445001900	3.17	Developed Local Parks and Recreation	36	900s	1	Only on-site runoff can be treated, which will be occuring anyway.	23.15			Los Angeles CA	
4129037913	1.86	Vacant Undifferentiated	36	900s	1	Being developed.	57.61			Los Angeles CA	

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4129037907	1.67	Vacant Undifferentiated	36	900s	1	Being developed.	53.28			Los Angeles CA	
7446022900	1.65	Vacant Undifferentiated	36	900s	1	Area sizing does not appear usable based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	761.11			Los Angeles CA	
4129037911	1.45	Vacant Undifferentiated	36	900s	1	Being developed.	45.29			Los Angeles CA	
7428030900	0.69	Vacant Undifferentiated	36	900s	1	Entirely paved based on visual inspection.	674.66			Los Angeles CA	
9999999905	0.67	Vacant Undifferentiated	36	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	327.81			Los Angeles CA	
7439027901	0.58	Developed Local Parks and Recreation	36	900s	1	Harbor City Park. Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	2,249.09			Los Angeles CA	
7428029901	0.44	Vacant Undifferentiated	36	900s	1	Entirely paved based on visual inspection.	281.62			Los Angeles CA	
7428030901	0.28	Vacant Undifferentiated	36	900s	1	Entirely paved based on visual inspection.	745.84			Los Angeles CA	
7440012902	77.29	Vacant Undifferentiated	35	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,633.17			Los Angeles CA	
7440039910	37.24	Other Open Space and Recreation	35	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	2,615.43			Los Angeles CA	
6132018900	18.70	Developed Local Parks and Recreation	35	900s	1	Only on-site runoff can be treated, which will be occuring anyway.	741.81	12603	BROADWAY	Los Angeles CA	90061
7442001914	5.49	Vacant Area	35	900s	1	Being Developed	833.53			Los Angeles CA	
7448006900	5.14	Other Open Space and Recreation	35	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	552.22			Los Angeles CA	
7469030900	4.04	Developed Local Parks and Recreation	35	900s	1	Drains to ocean	1,839.88			Los Angeles CA	
7446018900	1.48	Vacant Undifferentiated	35	900s	1	Near Rena Park. Near watershed boundary and will receive runoff from outside of jurisdiction. Terrain is too steep and is mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	906.20			Los Angeles CA	
7456011900	1.41	Developed Local Parks and Recreation	35	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	979.83			Los Angeles CA	

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7455010902	0.97	Developed Local Parks and Recreation	35	900s	1	Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	766.08			Los Angeles CA	
4129037914	0.93	Vacant Undifferentiated	35	900s	1	Being developed.	25.06			Los Angeles CA	
7412026912	0.79	Developed Local Parks and Recreation	35	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	26.87			Los Angeles CA	
4129037916	0.62	Vacant Undifferentiated	35	900s	1	Being developed.	37.18			Los Angeles CA	
7412026917	34.38	Developed Local Parks and Recreation	34	900s	1	Only on-site runoff can be treated, which will be occuring anyway.	0.00			Los Angeles CA	
7440040907	31.33	Developed Local Parks and Recreation	34	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	358.33			Los Angeles CA	
4123018926	8.17	Developed Local Parks and Recreation	34	900s	1	Carl E Nielsen Youth Park. Located on watershed jurisdiction boundary. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself, but may be as large as 40 acres.	454.85			Los Angeles CA	
7447013900	1.15	Developed Local Parks and Recreation	34	900s	1	Area sizing does not appear usable based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,356.53			Los Angeles CA	
7440011907	1.02	Other Open Space and Recreation	34	900s	1	Mostly paved. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	676.02			Los Angeles CA	
7440021917	0.88	Vacant Undifferentiated	34	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	621.26			Los Angeles CA	
7455010903	0.65	Developed Local Parks and Recreation	34	900s	1	Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	936.62			Los Angeles CA	
7448034905	0.43	Vacant Undifferentiated	34	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,390.92			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7440029917	118.79	Vacant Undifferentiated	33	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	2,756.95	760	EARLE ST	Los Angeles CA	90731
7469018903	2.13	Developed Local Parks and Recreation	33	900s	1	Drains to ocean	1,765.86			Los Angeles CA	
7448007900	0.97	Other Open Space and Recreation	33	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,075.82			Los Angeles CA	
7462023900	0.94	Developed Local Parks and Recreation	33	900s	1	Sub-basin, drainage infrastructure and topography suggest that the parcel is too small to capture the 85th percentile design storm for the tributary area.	1,392.16			Los Angeles CA	
7447008901	0.87	Developed Local Parks and Recreation	33	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,366.00	420	OFARRELL ST	Los Angeles CA	90731
7467010900	0.72	Developed Local Parks and Recreation	33	900s	1	Angeles Gate Park. Drains to ocean	1,208.59			Los Angeles CA	
7560026904	0.42	Vacant Undifferentiated	33	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	27.26			Los Angeles CA	
4129037902	0.38	Vacant Undifferentiated	33	900s	1	Being developed.	430.99			Los Angeles CA	
7440039911	1.18	Other Open Space and Recreation	32	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	2,244.91			Los Angeles CA	
7447029900	0.96	Developed Local Parks and Recreation	32	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,522.72			Los Angeles CA	
7447030900	0.75	Developed Local Parks and Recreation	32	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,403.62			Los Angeles CA	
7440034906	0.56	Developed Local Parks and Recreation	32	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	2,206.50			Los Angeles CA	
7440034907	0.56	Developed Local Parks and Recreation	32	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	2,206.50			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7442001910	201.60	Developed Local Parks and Recreation	31	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	621.70			Los Angeles CA	
7467031900	2.82	Vacant Undifferentiated	31	900s	1	Drains to ocean	2,565.00			Los Angeles CA	
7440003912	0.78	Other Open Space and Recreation	31	900s	1	Mostly paved based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	3,218.43			Los Angeles CA	
7467011900	0.67	Developed Local Parks and Recreation	31	900s	1	Drains to ocean.	1,259.59			Los Angeles CA	
7448004900	0.48	Other Open Space and Recreation	31	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	405.87			Los Angeles CA	
7442001913	0.91	Vacant Area	30	900s	1	Being Developed	1,244.52			Los Angeles CA	
7448034906	0.32	Vacant Undifferentiated	30	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,359.91			Los Angeles CA	
7467032900	3.55	Developed Local Parks and Recreation	29	900s	1	Drains to ocean	2,564.87			Los Angeles CA	
7448033906	0.40	Vacant Undifferentiated	29	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,283.11			Los Angeles CA	
7448033901	0.40	Vacant Undifferentiated	29	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,230.39			Los Angeles CA	
7442001919	47.68	Vacant Area	28	900s	1	Being Developed	1,081.68			Los Angeles CA	
7469030901	1.77	Developed Local Parks and Recreation	27	900s	1	Drains to ocean	2,366.25			Los Angeles CA	
7448035906	2.32	Vacant Undifferentiated	26	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	893.56			Los Angeles CA	
7467030901	0.85	Vacant Undifferentiated	26	900s	1	Drains to ocean	2,603.13			Los Angeles CA	
7467030900	0.71	Vacant Undifferentiated	26	900s	1	Port Fermin Park. Drains to ocean.	2,462.80			Los Angeles CA	
7448035927	1.04	Vacant Undifferentiated	25	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	808.63			Los Angeles CA	
7448035932	1.04	Vacant Undifferentiated	25	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	808.63			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7448036919	1.00	Vacant Undifferentiated	23	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,203.81			Los Angeles CA	
7448036926	1.00	Vacant Undifferentiated	23	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,203.81			Los Angeles CA	
7448035908	0.39	Vacant Undifferentiated	23	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,171.89			Los Angeles CA	
7448035930	0.28	Vacant Undifferentiated	23	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,222.28	255	VIEWLAND PL	Los Angeles CA	90731
6121019900	6.74	Manufacturing, Assembly, and Industrial Servi	39	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			Los Angeles CA	
7428008908	3.13	Manufacturing, Assembly, and Industrial Servi	38	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	191.47			Los Angeles CA	
7428008906	3.13	Manufacturing, Assembly, and Industrial Servi	38	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	191.47			Los Angeles CA	
7452018903	2.87	Other Special Use Facilities	38	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	96.07	308	WEYMOUTH AVE	Los Angeles CA	90732
7315016900	0.44	Open Storage	35	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			Los Angeles CA	
7428008909	0.57	Open Storage	34	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	280.07			Los Angeles CA	
7428008907	0.57	Open Storage	34	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	280.07			Los Angeles CA	
7469017900	0.76	Other Public Facilities	33	900s	2	Drains to ocean	718.43			Los Angeles CA	
6130003900	2.11	Other Public Facilities	32	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	25.03	150	EL SEGUNDO BLVD	Los Angeles CA	90061
7428016911	0.79	Open Storage	32	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	670.23			Los Angeles CA	
7428016909	0.79	Open Storage	32	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	670.23			Los Angeles CA	
7428017939	0.28	Open Storage	31	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	903.18			Los Angeles CA	
7455027933	1.26	Other Special Use Facilities	30	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	43.45			Los Angeles CA	
7428016910	0.70	Open Storage	30	900s	2	Parcel has too high of a percentage of building cover	1,058.36			Los Angeles CA	

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AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
						based on visual inspection.					
7428016908	0.70	Open Storage	30	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,058.36			Los Angeles CA	
7428010901	0.57	Manufacturing, Assembly, and Industrial Servi	30	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,101.00			Los Angeles CA	
7428010900	0.57	Manufacturing, Assembly, and Industrial Servi	30	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,101.00			Los Angeles CA	
7428010903	0.44	Open Storage	30	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,253.98			Los Angeles CA	

City of El Segundo

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4138014901	**1.19**	**Vacant Undifferentiated**	**34**	**900s**	**1**	**Recommended - Part of El Segundo Project**	**324.14**			**El Segundo CA**	
4138014914	**6.23**	**Nurseries**	**36**	**900s**	**2**	**Recommended - El Segundo Project**	**0.00**			**El Segundo CA**	
4138002901	47.28	Base Government Offices	37	900s	2	Potential	31.64			El Segundo CA	
4138002904	0.96	Base Government Offices	34	900s	2	Potential	1.37			El Segundo CA	
4138003903	3.68	Low- and Medium-Rise Major Office Use	33	900s	2	Potential	380.38			El Segundo CA	
4138012004	6.41	Vacant Undifferentiated	33		3	Potential	309.53	655	DOUGLAS ST	El Segundo CA	90245
4138015007	7.64	Vacant Undifferentiated	32		3	Potential	509.35			El Segundo CA	
4138030014	2.04	Vacant Undifferentiated	31		3	Potential	199.64			El Segundo CA	
4138015005	3.10	Vacant Undifferentiated	29		3	Potential	849.37			El Segundo CA	
4138030012	1.15	Vacant Undifferentiated	29		3	Potential	378.83			El Segundo CA	
4138030013	0.91	Vacant Undifferentiated	29		3	Potential	118.67			El Segundo CA	
4138030015	1.54	Vacant Undifferentiated	28		3	Potential	514.04			El Segundo CA	
4138030094	2.60	Vacant Undifferentiated	27		3	Potential	942.24			El Segundo CA	
4138030025	1.87	Vacant Undifferentiated	27		3	Potential	672.32			El Segundo CA	
4138030011	1.64	Vacant Undifferentiated	27		3	Potential	614.21			El Segundo CA	
4138030026	1.44	Vacant Undifferentiated	26		3	Potential	809.61			El Segundo CA	
4138030903	5.42	Vacant Undifferentiated	34	900s	1	Catchment area less than 10 acres	612.41			El Segundo CA	
4138014913	25.69	Golf Courses	33	900s	1	The Lakes at El Segundo Golf Coarse - only on-site runoff can be treated, which will be occuring anyway.	1,347.71	400	SEPULVEDA BLVD	El Segundo CA	90245
4138012901	0.52	Vacant Undifferentiated	33	900s	1	Entirely paved based on visual inspection.	318.47			El Segundo CA	
4138030904	1.00	Vacant Undifferentiated	31	900s	1	Catchment area less than 10 acres	413.63			El Segundo CA	
4138014910	0.75	Golf Courses	29	900s	1	The Lakes at El Segundo Golf Coarse - only on-site runoff can be treated, which will be occuring anyway.	1,888.75			El Segundo CA	
4138002903	3.39	Base Government Offices	36	900s	2	Site too small for drainage based on visual inspection.	1.97			El Segundo CA	
4138001900	1.09	Manufacturing, Assembly, and Industrial Servi	33	900s	2	Site too small for drainage based on visual inspection.	273.80			El Segundo CA	
4138001906	0.81	Research and Development	33	900s	2	Site too small for drainage based on visual inspection.	0.00			El Segundo CA	
4138001905	0.27	Research and Development	33	900s	2	Site too small for drainage based on visual inspection.	10.95			El Segundo CA	
4138014915	1.55	Park-and-Ride Lots	32	900s	2	Site too small for drainage based on visual inspection.	0.00			El Segundo CA	
4138002902	1.85	Research and Development	31	900s	2	Site too small for drainage based on visual inspection.	658.93			El Segundo CA	
4138012904	1.53	Low- and Medium-Rise Major Office Use	30	900s	2	Site too small for drainage based on visual inspection.	445.97			El Segundo CA	
4138002905	0.74	Base Government Offices	28	900s	2	Site too small for drainage based on visual inspection.	1,252.34			El Segundo CA	
4138004910	0.39	Research and Development	26	900s	2	Site too small for drainage based on visual inspection.	1,269.67			El Segundo CA	
4138015012	7.00	Vacant Undifferentiated	33		3	Catchment area less than 10 acres	337.94	2021	ROSECRANS AVE	El Segundo CA	90245
4138015006	9.85	Vacant Undifferentiated	32		3	Catchment area less than 10 acres	498.21			El Segundo CA	
4138015033	4.09	Vacant Undifferentiated	32		3	Catchment area less than 10 acres	568.04			El Segundo CA	

City of El Segundo

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4138015043	3.28	Vacant Undifferentiated	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	916.53			El Segundo CA	
4138015044	1.88	Vacant Undifferentiated	28		3	Parcel has too high of a percentage of building cover based on visual inspection.	618.61			El Segundo CA	
4138015014	1.83	Vacant Undifferentiated	28		3	Catchment area less than 10 acres	697.10	324	SEPULVEDA BLVD	El Segundo CA	90245
4138015008	1.11	Vacant Undifferentiated	28		3	Catchment area less than 10 acres	615.98			El Segundo CA	
4138012810	0.67	Vacant Undifferentiated	28		3	Catchment area less than 10 acres	591.08			El Segundo CA	
4138012809	0.47	Vacant Undifferentiated	28		3	Catchment area less than 10 acres	580.12			El Segundo CA	
4138015803	0.32	Vacant Undifferentiated	28		3	Catchment area less than 10 acres	497.40			El Segundo CA	
4138015052	2.42	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,294.38			El Segundo CA	
4138030023	2.42	Vacant Undifferentiated	27		3	Catchment area less than 10 acres	899.88			El Segundo CA	
4138015042	2.39	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,128.54			El Segundo CA	
4138030093	2.15	Vacant Undifferentiated	27		3	Catchment area less than 10 acres	1,284.48			El Segundo CA	
4138015800	2.10	Vacant Undifferentiated	27		3	Catchment area less than 10 acres	1,142.83			El Segundo CA	
4138015050	2.09	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,575.85			El Segundo CA	
4138015058	2.06	Vacant Undifferentiated	27		3	Catchment area less than 10 acres	1,294.85			El Segundo CA	
4138030092	2.59	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,112.22			El Segundo CA	
4138030047	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030044	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030057	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030043	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030045	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030054	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030056	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030046	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030042	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030055	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030049	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030051	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030040	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030050	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030052	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030041	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030048	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030053	2.51	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,456.45			El Segundo CA	
4138030028	2.33	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,606.60			El Segundo CA	

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4138030085	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030073	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030076	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030072	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030074	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030075	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030081	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030082	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030077	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030079	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030080	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030087	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030078	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030083	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030086	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030084	2.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,264.67			El Segundo CA	
4138030034	2.16	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,311.34			El Segundo CA	
4138030022	2.01	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,088.14			El Segundo CA	
4138015040	1.36	Vacant Undifferentiated	26		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,499.18			El Segundo CA	
4138015059	1.25	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,240.60			El Segundo CA	
4138030010	1.18	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	892.27			El Segundo CA	
4138015060	1.15	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,242.50			El Segundo CA	
4138015037	1.07	Vacant Undifferentiated	26		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,943.73			El Segundo CA	
4138015049	1.06	Vacant Undifferentiated	26		3	Catchment area less than 10 acres	1,712.32			El Segundo CA	
4138015051	1.05	Vacant Undifferentiated	26		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,471.29			El Segundo CA	
4138030035	1.81	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,323.87			El Segundo CA	
4138030009	1.37	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,092.24			El Segundo CA	
4138030064	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030066	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030068	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030070	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030071	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030069	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030065	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	
4138030067	1.16	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,401.46			El Segundo CA	

City of El Segundo

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4138030058	1.12	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,525.90			El Segundo CA	
4138030059	1.12	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,525.90			El Segundo CA	
4138030062	1.12	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,525.90			El Segundo CA	
4138030060	1.12	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,525.90			El Segundo CA	
4138030061	1.12	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,525.90			El Segundo CA	
4138030063	1.12	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,525.90			El Segundo CA	
4138030024	1.11	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,062.28			El Segundo CA	
4138015048	1.00	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,729.07			El Segundo CA	
4138015047	0.98	Vacant Undifferentiated	25		3	Catchment area less than 10 acres	1,741.94			El Segundo CA	
4138015041	0.94	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,354.92			El Segundo CA	
4138015053	0.86	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,308.61			El Segundo CA	
4138015055	0.80	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,597.68			El Segundo CA	
4138015039	0.73	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,717.70			El Segundo CA	
4138015038	0.66	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,836.12			El Segundo CA	
4138015054	0.42	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,479.50			El Segundo CA	
4138030039	0.74	Vacant Undifferentiated	24		3	Catchment area less than 10 acres	1,739.91			El Segundo CA	
4138030037	0.74	Vacant Undifferentiated	24		3	Catchment area less than 10 acres	1,739.91			El Segundo CA	
4138030038	0.74	Vacant Undifferentiated	24		3	Catchment area less than 10 acres	1,739.91			El Segundo CA	
4138030036	0.74	Vacant Undifferentiated	24		3	Catchment area less than 10 acres	1,739.91			El Segundo CA	

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4051032903	4.10	Developed Local Parks and Recreation	42	900s	1	Recommended--Jim Thorpe Park	704.72			Hawthorne CA	
4051029901	3.53	Developed Local Parks and Recreation	40	900s	1	Recommended--Jim Thorpe Park	896.76	13913	CORDARY AVE	Hawthorne CA	90250
4043002904	1.69	Developed Local Parks and Recreation	35	900s	1	Recommended--Ramona Park	627.02			Hawthorne CA	
4049009904	**6.59**	**Developed Local Parks and Recreation**	**41**	**900s**	**1**	**Viable alternative - Hawthorne Memorial Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**1,429.65**			**Hawthorne CA**	
4041014910	1.02	Developed Local Parks and Recreation	37	900s	1	Not Recommended--Jim Thorpe Park. Parcel has too high of a percentage of building cover based on visual inspection.	1,369.13	14027	CORDARY AVE	Hawthorne CA	90250
4041014907	1.45	Vacant Undifferentiated	43	900s	1	Park w/in Channel	0.00			Hawthorne CA	
4041019900	1.41	Vacant Undifferentiated	43	900s	1	Park w/in Channel	0.00			Hawthorne CA	
4041018900	1.26	Vacant Undifferentiated	43	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			Hawthorne CA	
4041014909	4.01	Developed Local Parks and Recreation	41	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	484.05			Hawthorne CA	
4149012905	0.86	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	677.49	13929	YUKON AVE	Hawthorne CA	90250
4145032900	0.86	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	677.50	14001	YUKON AVE	Hawthorne CA	90250
4149011804	6.62	Developed Local Parks and Recreation	37	900s	1	Located in steep area. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	692.19	12601	ISIS AVE	Hawthorne CA	90250
4149011805	0.70	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	959.52	13928	KORNBLUM AVE	Hawthorne CA	90250
4048004058	0.55	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	970.80	14001	YUKON AVE	Hawthorne CA	90250
4149016061	0.26	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	971.15	13934	KORNBLUM AVE	Hawthorne CA	90250
4051029003	2.54	Developed Local Parks and Recreation	36	900s	1	Too developed based on visual inspection. Next to Ramona Park. Sub-basin, drainage infrastructure and	867.02			Hawthorne CA	

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
						topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.					
4149018042	0.47	Vacant Undifferentiated	36	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,087.53	3658	139TH ST	Hawthorne CA	90250
4149018035	0.40	Vacant Undifferentiated	36	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,116.16	13918	KORNBLUM AVE	Hawthorne CA	90250
4149018046	1.55	Developed Local Parks and Recreation	35	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	542.05			Hawthorne CA	
4149018043	1.00	Vacant Undifferentiated	34	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,485.70			Hawthorne CA	
4149018044	0.47	Developed Local Parks and Recreation	34	900s	1	Entirely paved based on visual inspection.	446.92			Hawthorne CA	
4149018034	1.19	Vacant Undifferentiated	33	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	951.90			Hawthorne CA	
4149018033	1.87	Police and Sheriff Stations	36	900s	2	Potential	697.58			Hawthorne CA	
4149018045	1.17	Police and Sheriff Stations	36	900s	2	Potential	697.41			Hawthorne CA	
4149018041	1.76	Government Offices	34	900s	2	Potential	918.78	12643	EUCALYPTUS AVE	Hawthorne CA	90250
4149018036	1.36	Government Offices	34	900s	2	Potential	839.22	12700	INGLEWOOD AVE	Hawthorne CA	90250
4149018038	0.41	Fire Stations	33	900s	2	Potential	1,086.70	4447	EL SEGUNDO BLVD	Hawthorne CA	90250
4149018040	0.40	Electrical Power Facilities	32	900s	2	Potential	894.89			Hawthorne CA	
4149018037	0.29	Fire Stations	31	900s	2	Potential	1,224.56	5323	ROSECRANS AVE	Hawthorne CA	90250
4149018049	6.91	Other Public Facilities	39	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,917.55			Hawthorne CA	
4149018039	9.32	Mixed Transportation (Developed Local Parks and Recreation)	38	900s	2	Entirely paved based on visual inspection.	917.15			Hawthorne CA	
4149018047	2.99	Government Offices	37	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,103.58			Hawthorne CA	
4149018048	0.50	Police and Sheriff Stations	34	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	978.28	12700	GREVILLEA AVE	Hawthorne CA	90250
4149018050	0.49	Fire Stations	33	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,166.75	4463	EL SEGUNDO BLVD	Hawthorne CA	90250
4051029013	0.33	Police and Sheriff Stations	33	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	1,086.76	12726	GREVILLEA AVE	Hawthorne CA	90250
4149013076	18.76	Other Open Space and Recreation	38		3	Potential	41.13			Hawthorne CA	
4149013069	4.39	Other Open Space and Recreation	38		3	Potential	41.17			Hawthorne CA	
4051030901	0.59	Vacant Undifferentiated	38		3	Potential	42.58			Hawthorne CA	
4055008900	3.89	Vacant Undifferentiated	34		3	Potential	117.06	14610	HINDRY AVE	Hawthorne CA	90250
4055021900	0.29	Developed Local Parks and Recreation	34		3	Potential	779.75	3926	139TH ST	Hawthorne CA	90250

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4055022900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4041016903	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4149011910	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051017900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051017901	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4143015900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051020902	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051020900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051020901	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4043002905	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051020905	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4051020903	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4145020904	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4145030900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4145021900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4145025900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4049010900	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4050013901	2.82	Developed Local Parks and Recreation	33		3	Potential	697.64			Hawthorne CA	
4041014911	0.60	Developed Local Parks and Recreation	33		3	Potential	830.67	3906	139TH ST	Hawthorne CA	90250
4041014908	2.49	Vacant Undifferentiated	32		3	Potential	859.13	14400	HINDRY AVE	Hawthorne CA	90250
4041014913	0.47	Vacant Undifferentiated	29		3	Potential	1,230.22	5230	ROSECRANS AVE	Hawthorne CA	90250
4056031017	9.41	Vacant Undifferentiated	42		3	Parcel has too high of a percentage of building cover based on visual inspection.	13.62	12250	CRENSHAW BLVD	Hawthorne CA	90250
4056031015	8.38	Vacant Undifferentiated	42		3	Parcel has too high of a percentage of building cover based on visual inspection.	0.00	12200	WILKIE AVE	Hawthorne CA	90250
4056031018	5.66	Vacant Undifferentiated	42		3	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			Hawthorne CA	
4056031803	4.66	Vacant Undifferentiated	42		3	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			Hawthorne CA	
4056031014	4.65	Vacant Undifferentiated	40		3	Parcel has too high of a percentage of building cover based on visual inspection.	526.84	2750	120TH ST	Hawthorne CA	90250
4049011017	5.41	Developed Local Parks and Recreation	37		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,421.80	12600	PRAIRIE AVE	Hawthorne CA	90250
4071008034	0.99	Developed Local Parks and Recreation	37		3	Parcel has too high of a percentage of building cover based on visual inspection.	6.11	3330	147TH ST	Hawthorne CA	90250
4149011025	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5419	MARINE AVE	Hawthorne CA	90260
4149011044	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5467	MARINE AVE	Hawthorne CA	90250

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4149011009	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5451	MARINE AVE	Hawthorne CA	90260
4149011010	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5449	MARINE AVE	Hawthorne CA	90260
4149011042	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5471	MARINE AVE	Hawthorne CA	90250
4149011015	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5439	MARINE AVE	Hawthorne CA	90260
4149011032	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5405	MARINE AVE	Hawthorne CA	90260
4149011034	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5401	MARINE AVE	Hawthorne CA	90250
4149011021	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5427	MARINE AVE	Hawthorne CA	90260
4149011028	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5413	MARINE AVE	Hawthorne CA	90250
4149011007	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5455	MARINE AVE	Hawthorne CA	90260
4149011026	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5417	MARINE AVE	Hawthorne CA	90260
4149011040	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5475	MARINE AVE	Hawthorne CA	90250
4149011016	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5437	MARINE AVE	Hawthorne CA	90260
4149011018	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5433	MARINE AVE	Hawthorne CA	90250
4149011033	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5403	MARINE AVE	Hawthorne CA	90260
4149011014	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5441	MARINE AVE	Hawthorne CA	90260
4149011006	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5457	MARINE AVE	Hawthorne CA	90260
4149011020	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5429	MARINE AVE	Hawthorne CA	90250
4149011031	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5407	MARINE AVE	Hawthorne CA	90260
4149011045	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5465	MARINE AVE	Hawthorne CA	90260
4149011017	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5435	MARINE AVE	Hawthorne CA	90260
4149011005	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5459	MARINE AVE	Hawthorne CA	90260

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4149011012	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5445	MARINE AVE	Hawthorne CA	90260
4149011037	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5481	MARINE AVE	Hawthorne CA	90260
4149011046	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5463	MARINE AVE	Hawthorne CA	90250
4149011029	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5411	MARINE AVE	Hawthorne CA	90250
4149011030	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5409	MARINE AVE	Hawthorne CA	90260
4149011013	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5443	MARINE AVE	Hawthorne CA	90260
4149011022	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5425	MARINE AVE	Hawthorne CA	90260
4149011036	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5483	MARINE AVE	Hawthorne CA	90250
4149011008	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5453	MARINE AVE	Hawthorne CA	90260
4149011043	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5469	MARINE AVE	Hawthorne CA	90260
4149011024	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5421	MARINE AVE	Hawthorne CA	90260
4149011027	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5415	MARINE AVE	Hawthorne CA	90260
4149011041	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5473	MARINE AVE	Hawthorne CA	90260
4149011035	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5485	MARINE AVE	Hawthorne CA	90250
4149011019	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5431	MARINE AVE	Hawthorne CA	90260
4149011023	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5423	MARINE AVE	Hawthorne CA	90260
4149011039	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5477	MARINE AVE	Hawthorne CA	90250
4149011038	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5479	MARINE AVE	Hawthorne CA	90260
4149011011	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5447	MARINE AVE	Hawthorne CA	90260
4149011047	2.17	Other Open Space and Recreation	36		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.31	5461	MARINE AVE	Hawthorne CA	90250
4048004043	1.37	Vacant Undifferentiated	35		3	Parcel has too high of a percentage of building cover based on visual inspection.	41.06	3653	120TH ST	Hawthorne CA	90303

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4051017011	0.85	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	663.25	13921	YUKON AVE	Hawthorne CA	90250
4051017007	0.43	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	677.50	14013	YUKON AVE	Hawthorne CA	90250
4051020032	0.55	Vacant Undifferentiated	33		3	Parcel has too high of a percentage of building cover based on visual inspection.	970.52	14024	KORNBLUM AVE	Hawthorne CA	90250
4149018060	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018078	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018066	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018080	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018083	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018064	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018081	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018057	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018072	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018084	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018073	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018056	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018058	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018075	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018055	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018059	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018052	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018054	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4149018077	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018079	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018061	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018063	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018065	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018051	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018062	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018069	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018076	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018068	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018070	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018074	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018082	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018067	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018071	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018085	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018086	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018053	1.44	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	691.81			Hawthorne CA	
4149018099	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018088	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018090	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	

City of Hawthorne

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4149018089	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018091	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018104	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018101	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018093	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018095	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018102	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018100	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018096	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018098	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018094	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018097	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018103	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018087	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	
4149018092	0.70	Developed Local Parks and Recreation	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	531.04			Hawthorne CA	

City of Inglewood

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4025011900	**19.30**	**Developed Local Parks and Recreation**	**41**	**900s**	**1**	**Recommended - Darby Park**	**267.97**	**3400**	**ARBOR VITAE ST**	**Inglewood CA**	**90305**
4048004900	1.90	Vacant Undifferentiated	43	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	0.00			Inglewood CA	
4034005900	1.12	Vacant Undifferentiated	41	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	69.29	10117	PRAIRIE AVE	Inglewood CA	90303
4018021902	9.92	Developed Local Parks and Recreation	40	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	31.83			Inglewood CA	
4032003914	3.45	Vacant Undifferentiated	40	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	737.86	3700	CENTURY BLVD	Inglewood CA	90303
4032001903	0.99	Vacant Undifferentiated	40	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	114.86	3939	102ND ST	Inglewood CA	90303
4032001902	0.34	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	514.85	3901	102ND ST	Inglewood CA	90303
4032002913	0.33	Vacant Undifferentiated	38	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	517.86	3822	CENTURY BLVD	Inglewood CA	90303
4032002914	0.87	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	787.95	3831	102ND ST	Inglewood CA	90303
4032002916	0.68	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	614.86	3851	102ND ST	Inglewood CA	90303
4032002915	0.51	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	714.96	3843	102ND ST	Inglewood CA	90303
4032004913	0.47	Vacant Undifferentiated	37	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	779.19			Inglewood CA	
4032002917	0.68	Vacant Undifferentiated	36	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	801.14	3821	102ND ST	Inglewood CA	90303
4032003915	0.57	Vacant Undifferentiated	35	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,064.01	3703	102ND ST	Inglewood CA	90303
4032003912	0.57	Vacant Undifferentiated	35	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,065.47			Inglewood CA	
4021015901	0.37	Developed Local Parks and Recreation	33	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	758.43			Inglewood CA	
4021015909	0.27	Developed Local Parks and Recreation	32	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	812.75			Inglewood CA	
4018024905	0.84	Developed Local Parks and Recreation	31	900s	1	Ashwood Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	683.24	700	KELSO ST	Inglewood CA	90301

City of Inglewood

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
4018017900	0.84	Developed Local Parks and Recreation	31	900s	1	Ashwood Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	683.96			Inglewood CA	
4021014905	0.44	Developed Local Parks and Recreation	31	900s	1	Parcel has too high of a percentage of building cover based on visual inspection.	1,150.42	106	MANCHESTER BLVD	Inglewood CA	90301
4010023900	0.35	Developed Local Parks and Recreation	28	900s	1	Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	3,499.75			Inglewood CA	
4025011037	222.36	Developed Local Parks and Recreation	40		3	Potential	0.00			Inglewood CA	
4030002044	9.59	Vacant Undifferentiated	40		3	Potential	0.00	3380	CENTURY BLVD	Inglewood CA	90303
4025011027	25.55	Vacant Undifferentiated	35		3	Potential	597.84			Inglewood CA	
4030001013	3.21	Vacant Undifferentiated	35		3	Potential	828.70	3504	CENTURY BLVD	Inglewood CA	90303
4030001011	15.73	Vacant Undifferentiated	34		3	Potential	842.33	3560	CENTURY BLVD	Inglewood CA	90303
4030001012	1.37	Vacant Undifferentiated	34		3	Potential	784.67	3540	CENTURY BLVD	Inglewood CA	90303
4024009004	0.47	Vacant Undifferentiated	33		3	Potential	359.70	937	PRAIRIE AVE	Inglewood CA	90301
4032004045	7.11	Vacant Undifferentiated	37		3	Parcel has too high of a percentage of building cover based on visual inspection.	779.63	3624	CENTURY BLVD	Inglewood CA	90303
4025011012	19.17	Developed Local Parks and Recreation	35		3	Parcel has too high of a percentage of building cover based on visual inspection.	725.37	3107	ARBOR VITAE ST	Inglewood CA	90305
4032002039	1.65	Vacant Undifferentiated	35		3	Parcel has too high of a percentage of building cover based on visual inspection.	530.07	3846	CENTURY BLVD	Inglewood CA	90303
4032001048	1.03	Vacant Undifferentiated	35		3	Parcel has too high of a percentage of building cover based on visual inspection.	414.95	3915	102ND ST	Inglewood CA	90303
4024008029	2.47	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	455.49	924	OSAGE AVE	Inglewood CA	90301
4032003062	1.87	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	674.48	3730	CENTURY BLVD	Inglewood CA	90303
4025023069	1.43	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	230.06			Inglewood CA	
4025022041	1.09	Developed Local Parks and Recreation	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	298.97			Inglewood CA	
4030002056	0.41	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	500.74	3400	CENTURY BLVD	Inglewood CA	90303
4025023072	0.26	Vacant Undifferentiated	34		3	Parcel has too high of a percentage of building cover based on visual inspection.	123.34			Inglewood CA	
4025023077	0.26	Vacant Undifferentiated	33		3	Parcel has too high of a percentage of building cover based on visual inspection.	225.22			Inglewood CA	
4030002057	0.46	Vacant Undifferentiated	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	871.01	3490	CENTURY BLVD	Inglewood CA	90303
4023012900	1.34	High-Density Single Family Residential	35	900s	2	Potential	392.05			Inglewood CA	
4025025063	0.29	Vacant Undifferentiated	32		3	Parcel has too high of a percentage of building cover based on	489.31			Inglewood CA	

City of Inglewood

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
						visual inspection.					
4024009030	0.26	Vacant Undifferentiated	32		3	Parcel has too high of a percentage of building cover based on visual inspection.	436.91	1000	OSAGE AVE	Inglewood CA	90301
4024008020	0.71	Vacant Undifferentiated	31		3	Parcel has too high of a percentage of building cover based on visual inspection.	606.57	919	PRAIRIE AVE	Inglewood CA	90301
4025023071	0.29	Vacant Undifferentiated	31		3	Parcel has too high of a percentage of building cover based on visual inspection.	616.14			Inglewood CA	
4025025067	0.25	Vacant Undifferentiated	30		3	Parcel has too high of a percentage of building cover based on visual inspection.	811.06			Inglewood CA	
4025024099	0.25	Vacant Undifferentiated	29		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,045.32			Inglewood CA	
4015024020	10.16	Developed Local Parks and Recreation	28		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,406.99	333	PRAIRIE AVE	Inglewood CA	90301
4021014047	0.74	Developed Local Parks and Recreation	28		3	Too small drainage area based on visual inspection.	978.95	230	GREVILLEA AVE	Inglewood CA	90301
4126007066	2.33	Vacant Undifferentiated	27		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,785.63	355	GLASGOW AVE	Inglewood CA	90301
4126008015	0.89	Vacant Undifferentiated	25		3	Parcel has too high of a percentage of building cover based on visual inspection.	2,015.44	400	HINDRY AVE	Inglewood CA	90301

City of Lomita

AIN	Acres	Land Use	TOTAL SCORE	Gov_Type	Tier	OMIT Parcel	Revised Waterway Distance	Street Number	Street Name	City and State	Zip Code
7372021902	**5.78**	**Developed Local Parks and Recreation**	**40**	**900s**	**1**	**Viable alternative - Lomita Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**1,529.10**			**Lomita CA**	
7372008901	**0.96**	**Developed Local Parks and Recreation**	**36**	**900s**	**1**	**Viable alternative - Lomita Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**2,070.43**			**Lomita CA**	
7372008902	**0.93**	**Developed Local Parks and Recreation**	**36**	**900s**	**1**	**Viable alternative - Lomita Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.**	**1,973.46**	**24316**	**ESHELMAN AVE**	**Lomita CA**	**90717**
7552001903	12.47	Vacant Undifferentiated	39	900s	1	Being Developed	1,162.80			Lomita CA	
7372008903	1.26	Developed Local Parks and Recreation	37	900s	1	Part of Lomita Park. Too developed based on visual inspection. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,718.48	24309	WALNUT ST	Lomita CA	90717
7372008904	0.46	Developed Local Parks and Recreation	36	900s	1	Lomita Park. Sub-basin, drainage infrastructure and topography suggest that little flow could be diverted to site—likely less than 10 acres contributing area including the site itself.	1,737.71			Lomita CA	
7442001911	31.59	Vacant Area	34	900s	1	Being Developed	1,229.93			Lomita CA	
7553003902	2.02	Police and Sheriff Stations	40	900s	2	Potential	321.32	26123	NARBONNE AVE	Lomita CA	90717
7374001907	2.01	Government Offices	34	900s	2	Potential	1,210.42	24320	NARBONNE AVE	Lomita CA	90717
7553003903	0.53	Police and Sheriff Stations	36	900s	2	Parcel has too high of a percentage of building cover based on visual inspection.	618.67	26125	NARBONNE AVE	Lomita CA	90717
7374001048	1.34	Vacant Undifferentiated	31		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,656.74	2101	245TH ST	Lomita CA	90717
7374014050	0.62	Vacant Undifferentiated	30		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,995.58			Lomita CA	
7374019026	0.46	Vacant Undifferentiated	30		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,951.66	2072	242ND ST	Lomita CA	90717
7374019025	0.28	Vacant Undifferentiated	30		3	Parcel has too high of a percentage of building cover based on visual inspection.	1,908.04			Lomita CA	
7372008051	0.27	Developed Local Parks and Recreation	30		3	Parcel has too high of a percentage of building cover based on visual inspection.	2,260.60	24218	ESHELMAN AVE	Lomita CA	90717

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Attachment Q

Field Investigation - Cone Penetrometer Testing

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May 6, 2015
Project No. 209077001

Mr. Richard Haimann
HDR Engineering, Inc.
100 Oceangate, Suite 1120
Long Beach, California 90802

Subject: Cone Penetrometer Testing
Dominguez Channel Watershed
Enhanced Watershed Management Program (EWMP)
County of Los Angeles, California

Dear Mr. Haimann:

In accordance with your request and authorization, we have performed cone penetrometer tests (CPTs) at six locations within the Dominguez Channel watershed boundary in the County of Los Angeles, California (Figure 1). The purpose of our CPT testing was to provide a preliminary assessment of the possible soil types at the selected locations and to correlate the data with ranges of vertical and horizontal hydraulic conductivities for those soil types. The hydraulic conductivities will then be used to estimate possible ranges of infiltration rates for the anticipated on-site soils.

Our services have included: review of geotechnical background information for the selected sites; coordination with City and County personnel for encroachment permits and field work schedules; acquisition of permits with the County of Los Angeles Environmental Health Department to penetrate groundwater; site visits for CPT markout and meetings with city and county representatives to discuss CPT locations and site access; subsurface exploration consisting of one CPT sounding at each location; data compilation and analysis; and preparation of this report.

GEOLOGIC SETTING

The project sites are located at the northwest end of the Peninsular Ranges geomorphic province of southern California (Norris and Webb, 1990). The Peninsular Ranges geomorphic province is characterized by northwest-trending mountain range blocks separated by similarly northwest-trending faults (Norris and Webb, 1990). The Los Angeles Basin lies within the Peninsular Ranges geomorphic province and has been divided into four structural blocks: the Northwestern Block, the Southwestern Block, the Central Block, and the Northeastern Block. The project sites are located in the Southwestern and Central Blocks of the Los Angeles Basin, which are bounded by the Santa Monica-Hollywood-Raymond fault system to the north and northwest, the Pacific Ocean and Palos Verdes Hills Fault to the southwest, the Whittier-Elsinore fault system to the east., and the San Joaquin Hills and Santa Ana Mountains to the southeast. The Southwestern and Central Blocks are characterized by thick sequences of alluvium overlying Cretaceous to Pleistocene-age sedimentary rocks (Norris and Webb, 1990).

Based on regional geologic mapping, the El Segundo Basin site is underlain by stabilized older eolian deposits (i.e., coastal sand dune deposits) consisting of dense to very dense, well-sorted, fine to medium grained sand and silty sand. The remaining sites located further inland are underlain by older alluvial flood plain deposits consisting of moderately consolidated, poorly sorted, gravel, sand, silt, and clay (Figure 2).

SUBSURFACE EXPLORATION

Our subsurface field work was conducted on April 2, 13, and 20, 2015. The subsurface exploration consisted of six CPT soundings to depths ranging from approximately 16 to 59 feet below the ground surface. The purpose of the CPT soundings was to provide a preliminary assessment of the possible soil types at the selected locations. The approximate locations of the CPT soundings are presented on Figures 3 through 7. Geologic cross-sections showing an illustrated representation of the anticipated soils at the site as encountered in the CPT were prepared for each location and are presented on Figures 8 through 13. The CPT data is presented in Appendix A.

Materials encountered during the CPT soundings generally consisted of alluvium to the depths explored. The alluvium was categorized into various soil behavior types (SBTs) as described in Robertson's (2010a) Guide to Cone Penetration Testing for Geotechnical Engineering. The term "clays" indicates a combination of silty clay and clay, "silt mixture" indicates clayey silt to silty clay, "sand mixture" indicates silty sand to sandy silt, and "sands" indicate clean sand to silty sand. General descriptions of the materials encountered in the CPTs are provided below.

Chester Washington Golf Course - North

As indicated in CPT-1, the materials encountered at the north location in the Chester Washington Golf Course generally consisted of interbedded layers of clays and silt mixture in the upper 4 feet, sand mixture from 4 feet to 10 feet, interbedded layers of sands and sand mixture from 10 to 34 feet, sand mixture from 34 to 43 feet, and sands from 43 feet to the depth explored. CPT refusal was met at approximately 53.5 feet below the ground surface.

Chester Washington Golf Course - South

As indicated in CPT-2, the materials encountered at the south location in the Chester Washington Golf Course generally consisted of clays in the upper 2 feet, sand mixture from 2 to 20 feet, sands from 20 to 29 feet, silt mixture from 29 to 43 feet, and interbedded layers of sands and sand mixture from approximately 43 feet to the depth explored. CPT refusal was met at approximately 47.9 feet below the ground surface.

El Segundo Basin

As indicated in CPT-3, the materials encountered at the El Segundo Basin site in the City of El Segundo generally consisted of clays in the upper approximately 2 feet, sand mixture from 2 to 5 feet, and sands from 5 feet to the depth explored. CPT refusal was met at approximately 15.9 feet below the ground surface.

Darby Park

As indicated in CPT-4, the materials encountered at the Darby Park site in the City of Inglewood generally consisted of sand mixture in the upper approximately 20 feet, sands from 20 to 25 feet, sand mixture from 25 to 36 feet, silt mixture from 36 to 41 feet, and sand mixture to the depth explored. CPT refusal was met at approximately 43.8 feet below the ground surface.

Ramona Park

As indicated in CPT-5, the materials encountered at the Ramona Park site in the City of Hawthorne generally consisted of interbedded layers of silt mixture and sand mixture in the upper 18 feet and sands from 18 feet to the depth explored. CPT refusal was met at approximately 20.3 feet below the ground surface.

Jim Thorpe Park

As indicated in CPT-6, the materials encountered at the Jim Thorpe Park site in the City of Hawthorne generally consisted of interbedded layers of silt mixture and sand mixture in the upper 16 feet, interbedded layers of clay and silt mixture from 16 to 57 feet, and interbedded layers of silt mixture and sand mixture from 57 feet to the depth explored. CPT refusal was met at approximately 59.2 feet below the ground surface.

HYDRAULIC CONDUCTIVITY

The permeability of earth materials is affected by the percentage of clay, silt, and sand in the soil. Accordingly, coarse grained soils will infiltrate storm water at higher rates than fine grained soils. Other factors can also affect the rate of storm water infiltration in soils, such as soil density, strength of the soil structure, organic matter, and clay mineralogy.

The CPT data collected during our field work was used to estimate the soil behavior types (SBT) based on the normalized SBT Index (I_c) by Robertson (2010b). The SBTs were then correlated with a range of estimated soil permeability (*k*) values based on the table provided in the published document for estimating soil permeabilities with CPT data. The estimated hydraulic conductivities of the soils encountered in the CPTs at each location are presented in Table 1.

Table 1 – Estimated Hydraulic Conductivity

CPT No.	Location	Depth (feet)	Soil Behavior Type (SBT)[1]	Vertical Conductivity[1] (cm/sec^2)	Horizontal Conductivity[1] (cm/sec^2)
1	Chester Washington Golf Course (North)	0-4	Interbedded Clays & Silt Mixture	1×10^{-8} to 1×10^{-5}	3×10^{-8} to 1×10^{-4}
		4-10	Sand Mixture	1×10^{-5} to 1×10^{-1}	3×10^{-5} to 1
		10-34	Interbedded Sands & Sand Mixture		
		34-43	Sand Mixture		
		43-TD	Sands		

Table 1 – Estimated Hydraulic Conductivity

CPT No.	Location	Depth (feet)	Soil Behavior Type (SBT)[1]	Vertical Conductivity[1] (cm/sec[2])	Horizontal Conductivity[1] (cm/sec[2])
2	Chester Washington Golf Course (South)	0-2	Clays	1×10^{-8} to 1×10^{-6}	
		2-20	Sand Mixture	3×10^{-7} to 1×10^{-1}	3×10^{-6} to 1
		20-29	Sands		
		29-43	Silt Mixture		
		43-TD	Interbedded Sands & Sand Mixture		
3	El Segundo Basin	0-2	Clays	1×10^{-8} to 1×10^{-6}	
		2-5	Sand Mixture	1×10^{-5} to 1×10^{-1}	3×10^{-5} to 1
		5-TD	Sands		
4	Darby Park	0-20	Sand Mixture	3×10^{-7} to 1×10^{-1}	3×10^{-6} to 1
		20-25	Sands		
		25-36	Sand Mixture		
		36-41	Silt Mixture		
		41-TD	Sand Mixture		
5	Ramona Park	0-18	Interbedded Silt Mixture & Sand Mixture	3×10^{-7} to 1×10^{-1}	3×10^{-6} to 1
		18-TD	Sands		
6	Jim Thorpe Park	0-16	Interbedded Silt Mixture & Sand Mixture	3×10^{-7} to 1×10^{-1}	3×10^{-6} to 1
		16-57	Interbedded Clays & Silt Mixture	1×10^{-8} to 1×10^{-5}	3×10^{-8} to 1×10^{-4}
		57-TD	Interbedded Silt Mixture & Sand Mixture	3×10^{-7} to 1×10^{-1}	3×10^{-6} to 1

Notes:
[1] Robertson (2010)
[2] cm/sec – centimeters per second

LIMITATIONS

Our scope of services was limited to one CPT sounding at each location as outlined herein. Our services did not include soil sampling, in-situ infiltration testing, or a geotechnical evaluation of potential impacts at the sites associated with infiltration systems. These services may be performed upon request.

The field evaluation and geotechnical analyses presented in this report have been conducted in general accordance with current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and professional opinions expressed in this report. Variations may exist and conditions not observed or described in this report may be encountered during further investigation or during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration.

The flow path of infiltration water at the sites is unknown and evaluation of the potential impacts of infiltration was beyond our scope of services.

This report is intended exclusively for use by the client. Any use or reuse of the findings of this report by parties other than the client is undertaken at said parties' sole risk.

We appreciate the opportunity to be of service on this project.

Respectfully submitted,
NINYO & MOORE

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Attachments: References
Figure 1 – Site Locations
Figure 2 – Regional Geology
Figures 3 through 7 – CPT Locations
Figures 8 through 13 – Cross Sections
Attachment A – Cone Penetration Test Data

Distribution: (1) Addressee (via e-mail)

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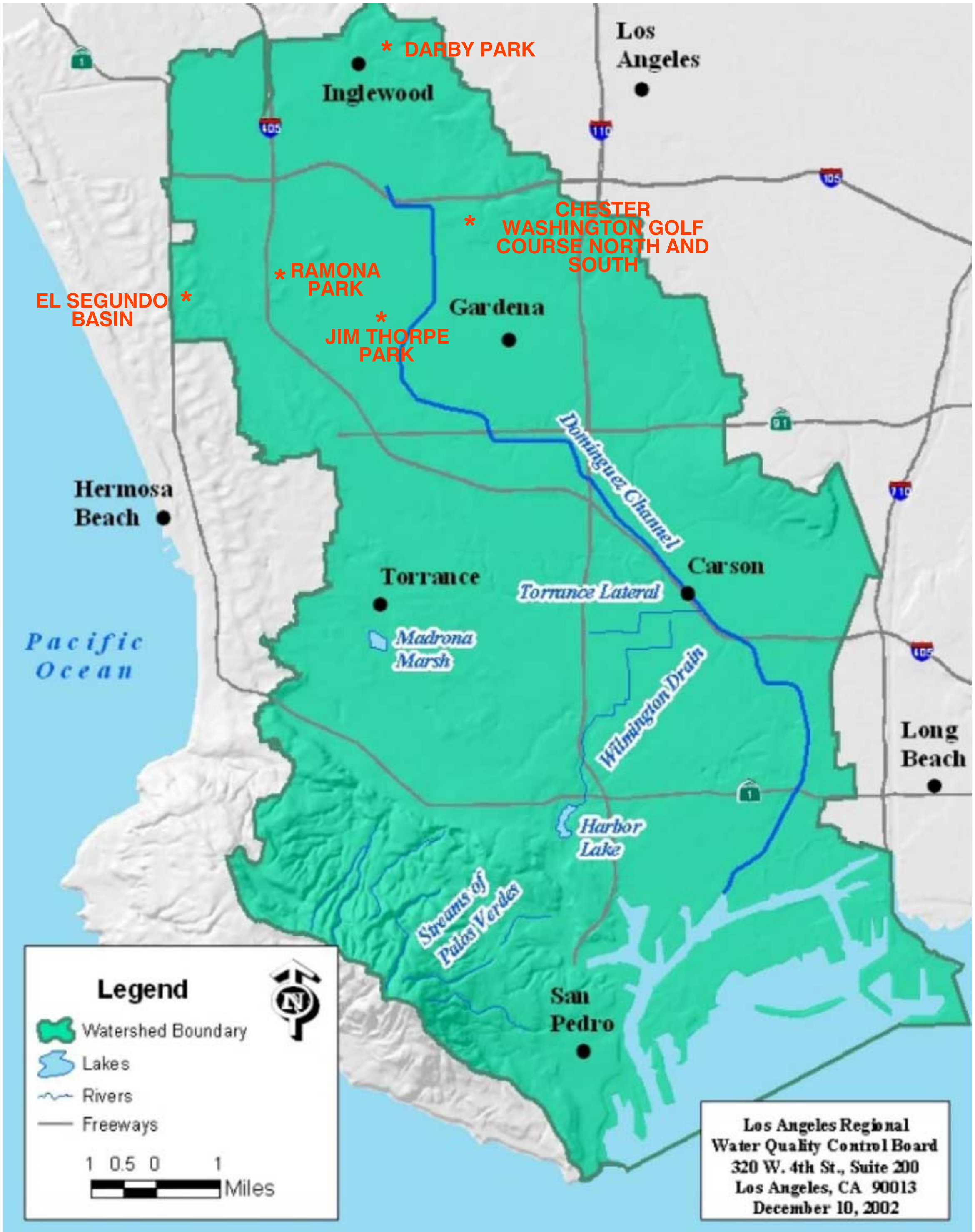
United States Geological Survey, 2012, Torrance, California Quadrangle Map, 7.5 Minute Series: Scale 1:24,000.

United States Geological Survey, 2012, Venice, California Quadrangle Map, 7.5 Minute Series: Scale 1:24,000.

AERIAL PHOTOGRAPHS

Source	Scale	Date	Flight	Numbers
USDA	1:20,000	11-4-52	AXK-4K	135, 136, 170, 171, 173, & 174
		12-4-52	AXK-7K	103, 104, 138, 139, 161, & 162
		6-4-53	AXK-13K	107 & 108



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SCALE IN MILES

0 2.5 5

N

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore		SITE LOCATIONS	FIGURE
PROJECT NO.	DATE	DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM COUNTY OF LOS ANGELES, CALIFORNIA	1
209077001	5/15		

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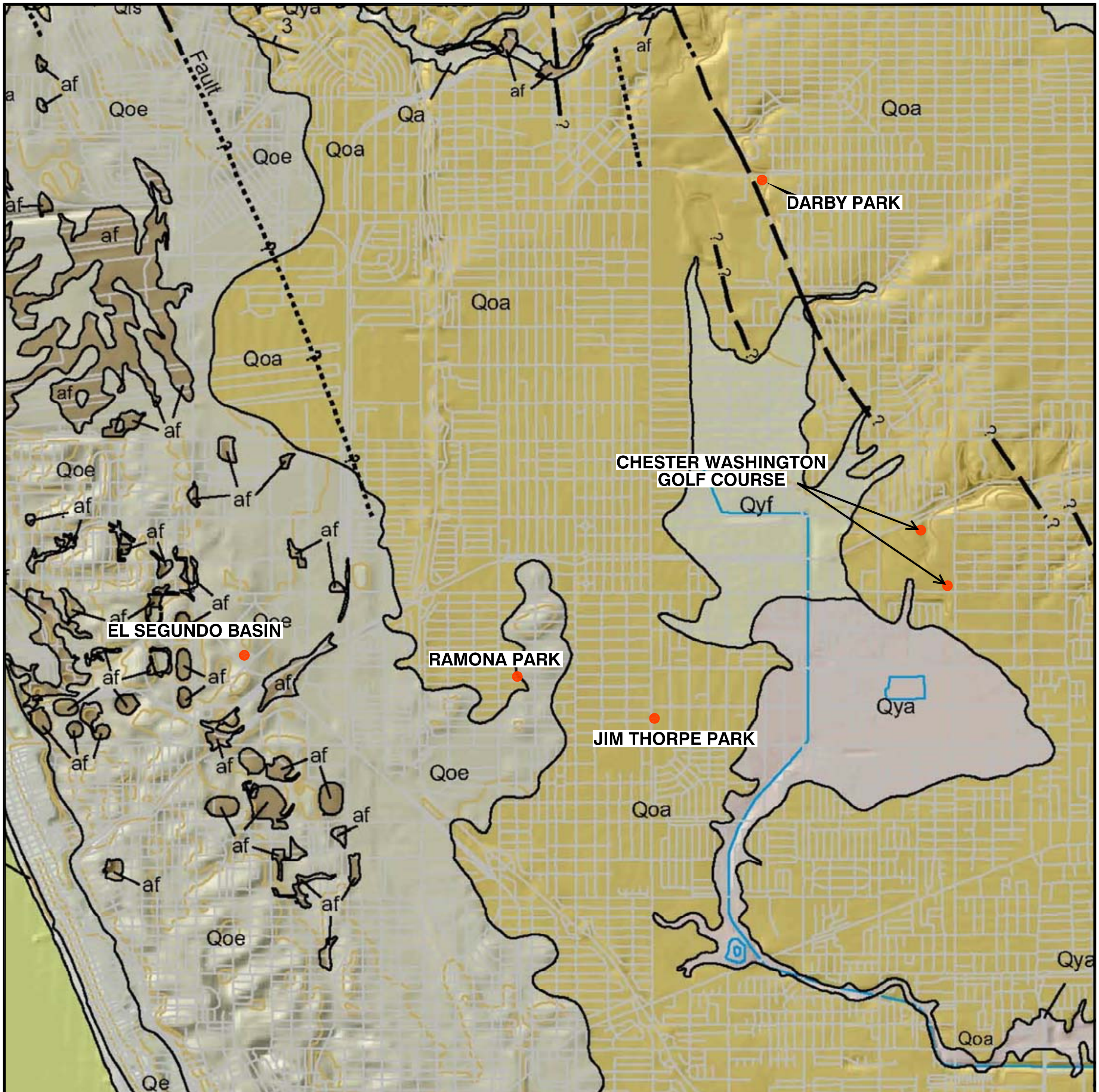

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N

SCALE IN FEET

0 5,000 10,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

Qoa	OLD ALLUVIAL FLOOD PLAIN DEPOSITS
Qoe	OLD EOLIAN DEPOSITS
	GEOLOGIC CONTACT
	FAULT; DOTTED WHERE CONCEALED

Ninyo & Moore

PROJECT NO.	DATE
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REGIONAL GEOLOGY

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE

2

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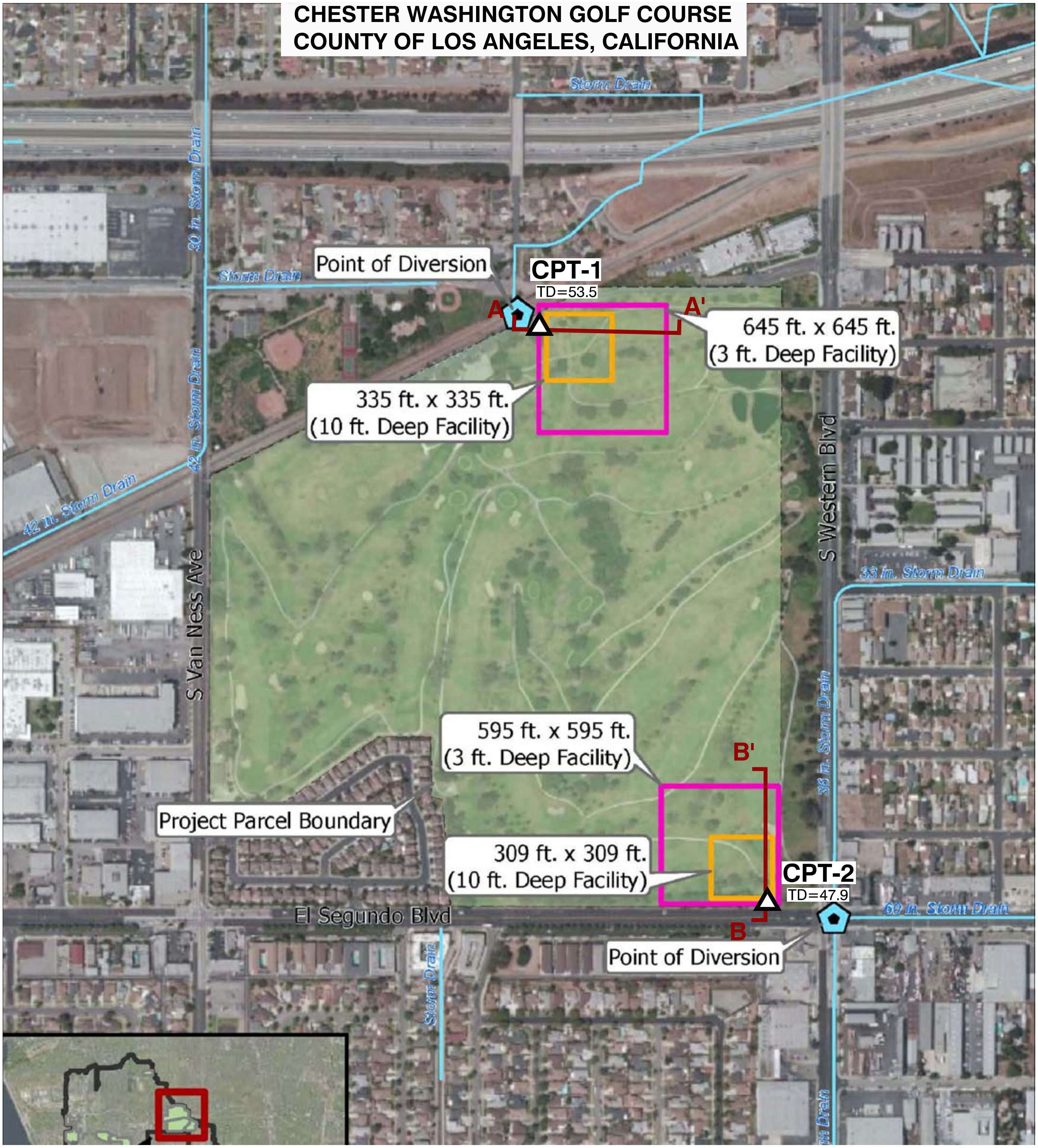

REFERENCE: TEAM DOMINGUEZ, 2014, DRAFT TECHNICAL MEMORANDUM, TASK F.4.2.2 - PRELIMINARY LIST OF REGIONAL PROJECTS - REVISED, DATED DECEMBER 15.

SCALE IN FEET

0 600 1,200

N

LEGEND

CPT-2 TD=47.9 △	CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET
B B'	CROSS SECTION

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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Ninyo & Moore

PROJECT NO.	DATE
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CPT LOCATIONS - CHESTER WASHINGTON GOLF COURSE

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE **3**

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REFERENCE: TEAM DOMINGUEZ, 2014, DRAFT TECHNICAL MEMORANDUM, TASK F.4.2.2 - PRELIMINARY LIST OF REGIONAL PROJECTS - REVISED, DATED DECEMBER 15.

SCALE IN FEET

0 150 300

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

N

LEGEND

CPT-3 TD=15.9 △ CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET

C C' CROSS SECTION

Ninyo & Moore

CPT LOCATION - EL SEGUNDO BASIN

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

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FIGURE 4

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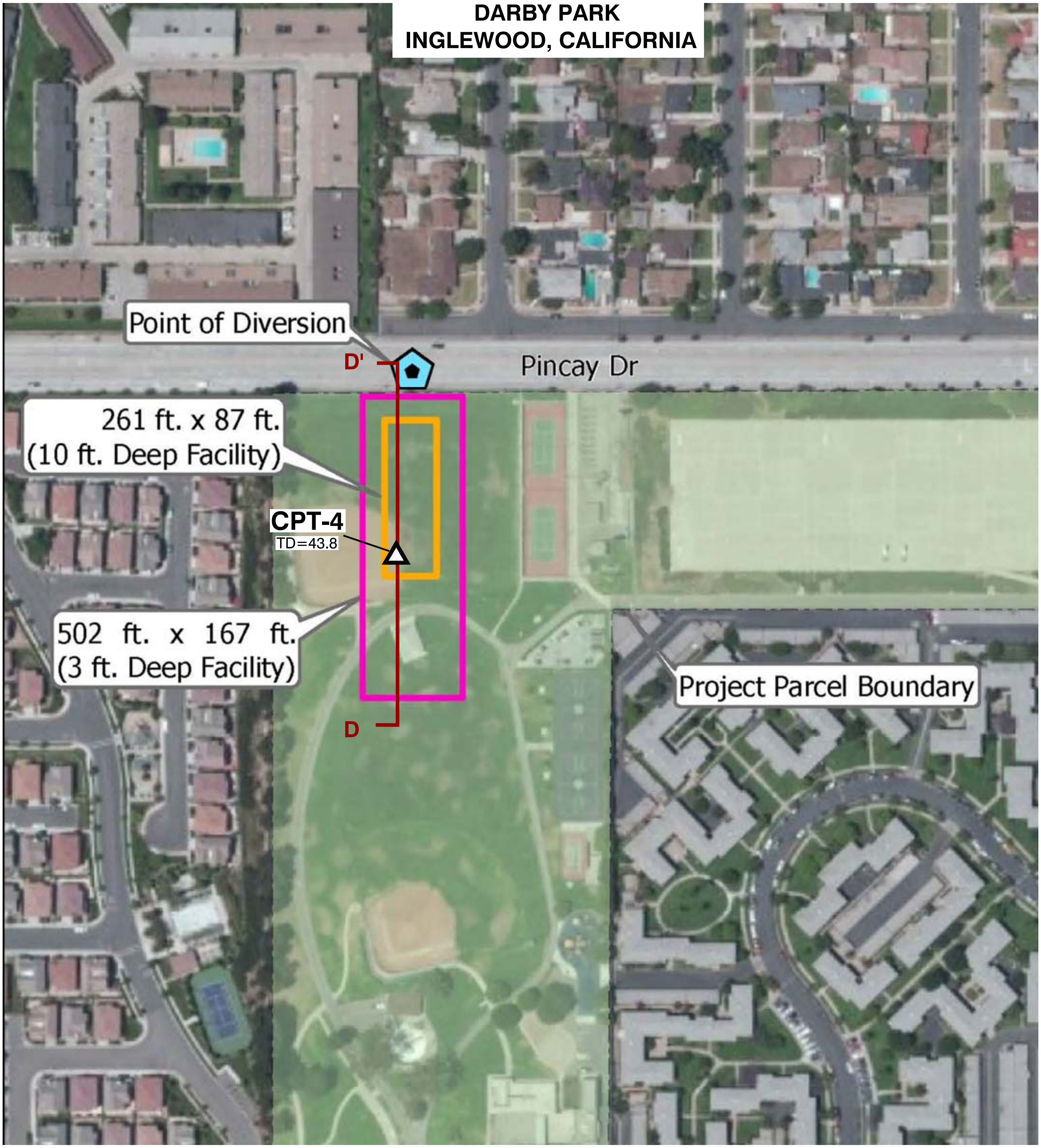

REFERENCE: TEAM DOMINGUEZ, 2014, DRAFT TECHNICAL MEMORANDUM, TASK F.4.2.2 - PRELIMINARY LIST OF REGIONAL PROJECTS - REVISED, DATED DECEMBER 15.

SCALE IN FEET

0 200 400

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

N

LEGEND

CPT-4 TD=43.8 △	CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET
D D'	CROSS SECTION

Ninyo & Moore

CPT LOCATION - DARBY PARK

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DOMINGUEZ CHANNEL ENHANCED WATERSHED
MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE

5

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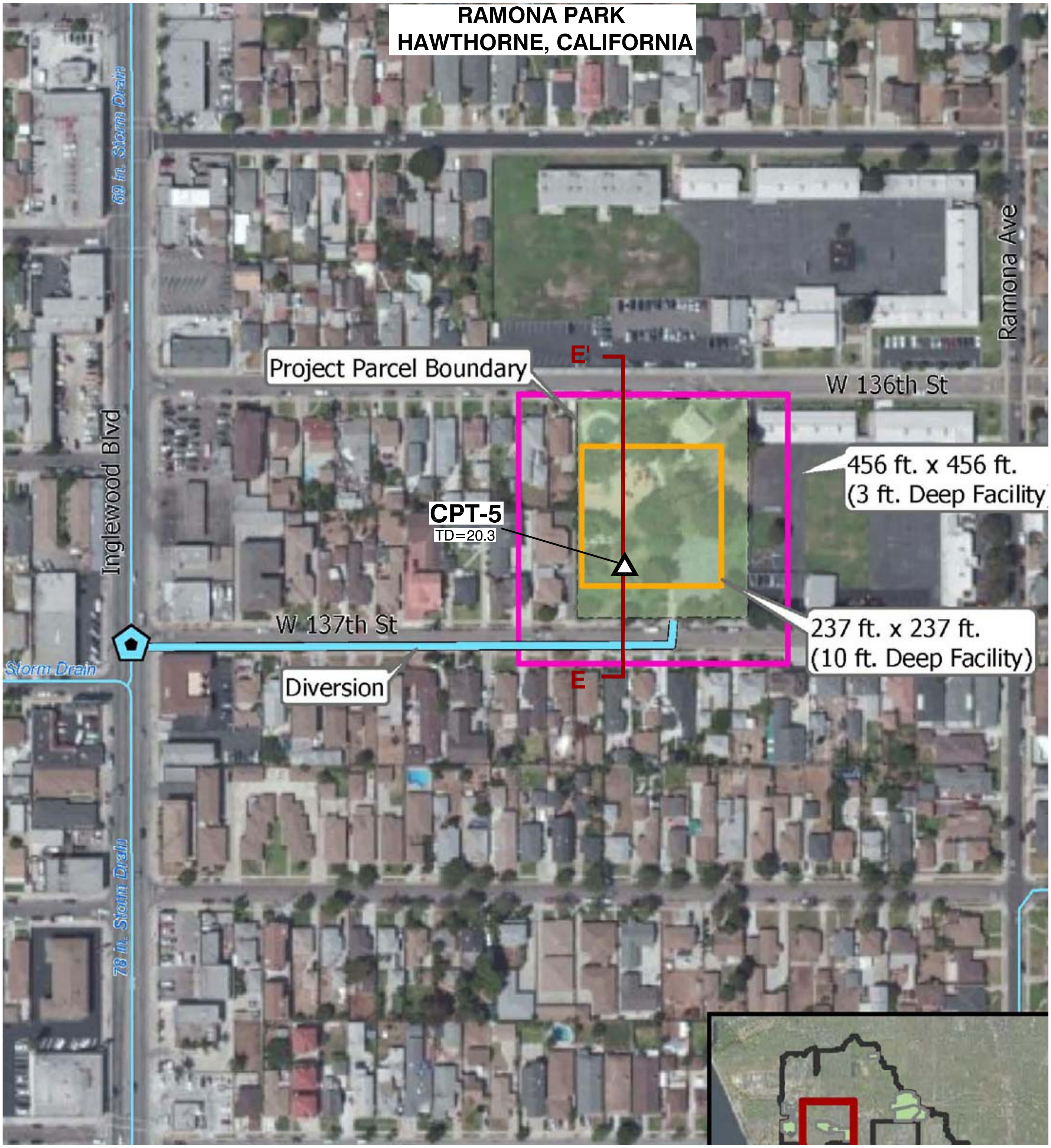

REFERENCE: TEAM DOMINGUEZ, 2014, DRAFT TECHNICAL MEMORANDUM, TASK F.4.2.2 - PRELIMINARY LIST OF REGIONAL PROJECTS - REVISED, DATED DECEMBER 15.

SCALE IN FEET

0 200 400

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

N

LEGEND

CPT-5 TD=20.3 △	CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET
E E'	CROSS SECTION

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Ninyo & Moore

CPT LOCATION - RAMONA PARK

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

PROJECT NO.	DATE
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FIGURE

6

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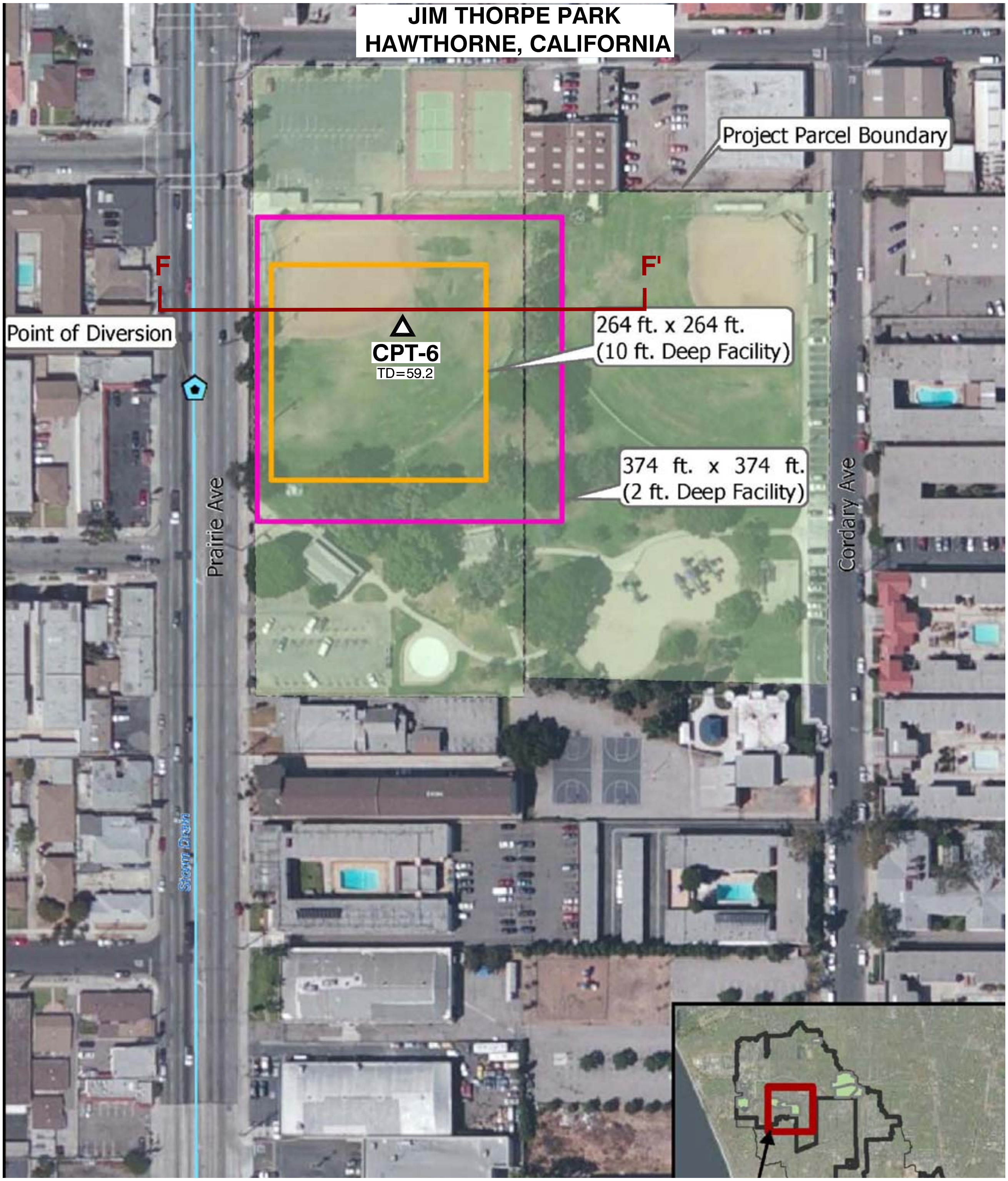

REFERENCE: TEAM DOMINGUEZ, 2014, DRAFT TECHNICAL MEMORANDUM, TASK F.4.2.2 - PRELIMINARY LIST OF REGIONAL PROJECTS - REVISED, DATED DECEMBER 15.

SCALE IN FEET

0 150 300

N

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

CPT-6 △ TD=59.2	CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET
F F'	CROSS SECTION

Ninyo & Moore		CPT LOCATION - JIM THORPE PARK	FIGURE
PROJECT NO.	DATE	DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM COUNTY OF LOS ANGELES, CALIFORNIA	7
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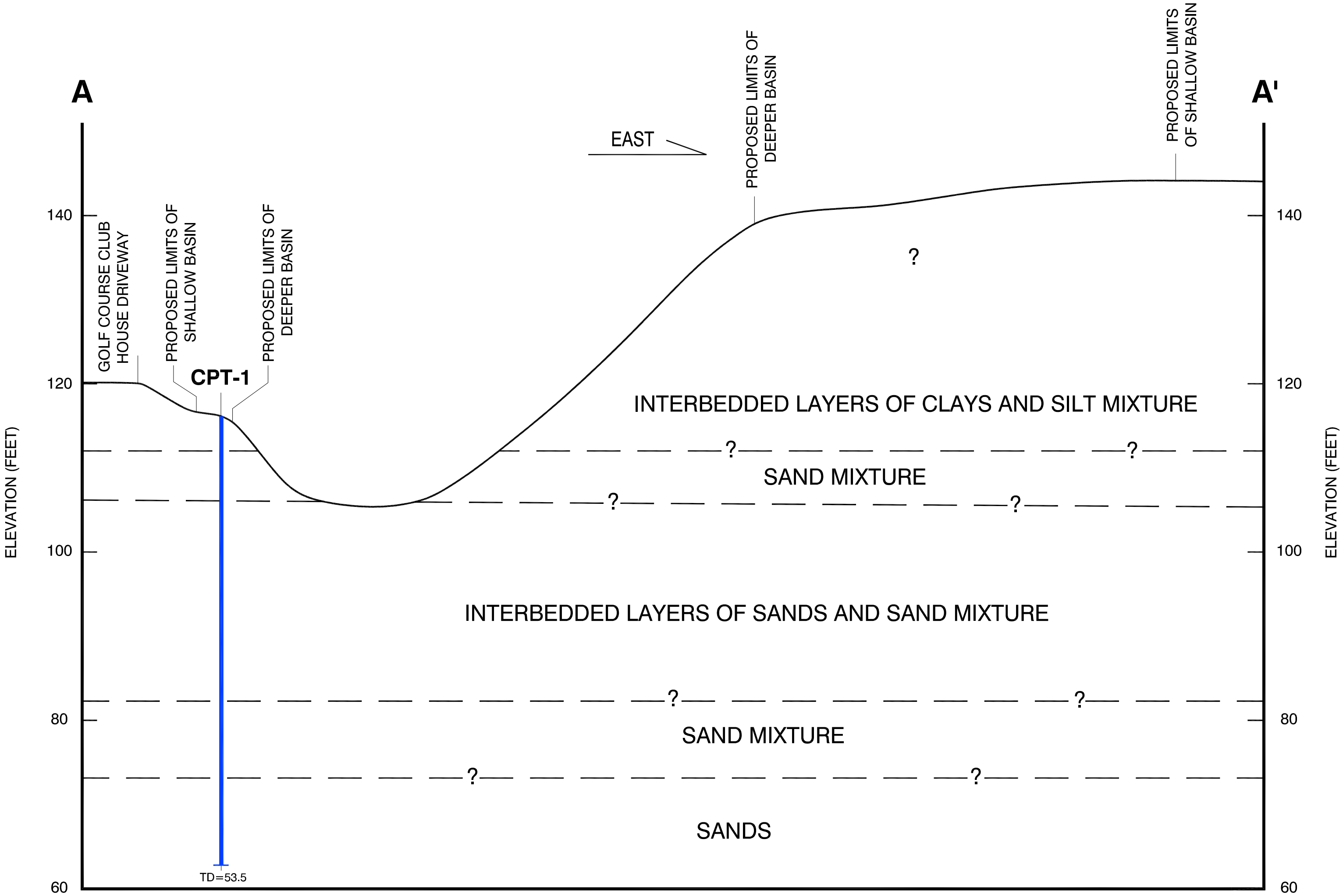

LEGEND

GEOLOGIC CONTACT; QUERIED WHERE INFERRED

CPT-1 TD=53.5 — CONE PENETROMETER; TD=TOTAL DEPTH IN FEET

SCALE IN FEET

Horiz. 0 100 200
Vert. 0 20 40

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

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CROSS SECTION A-A' - CHESTER WASHINGTON GOLF COURSE (NORTH)

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE 8

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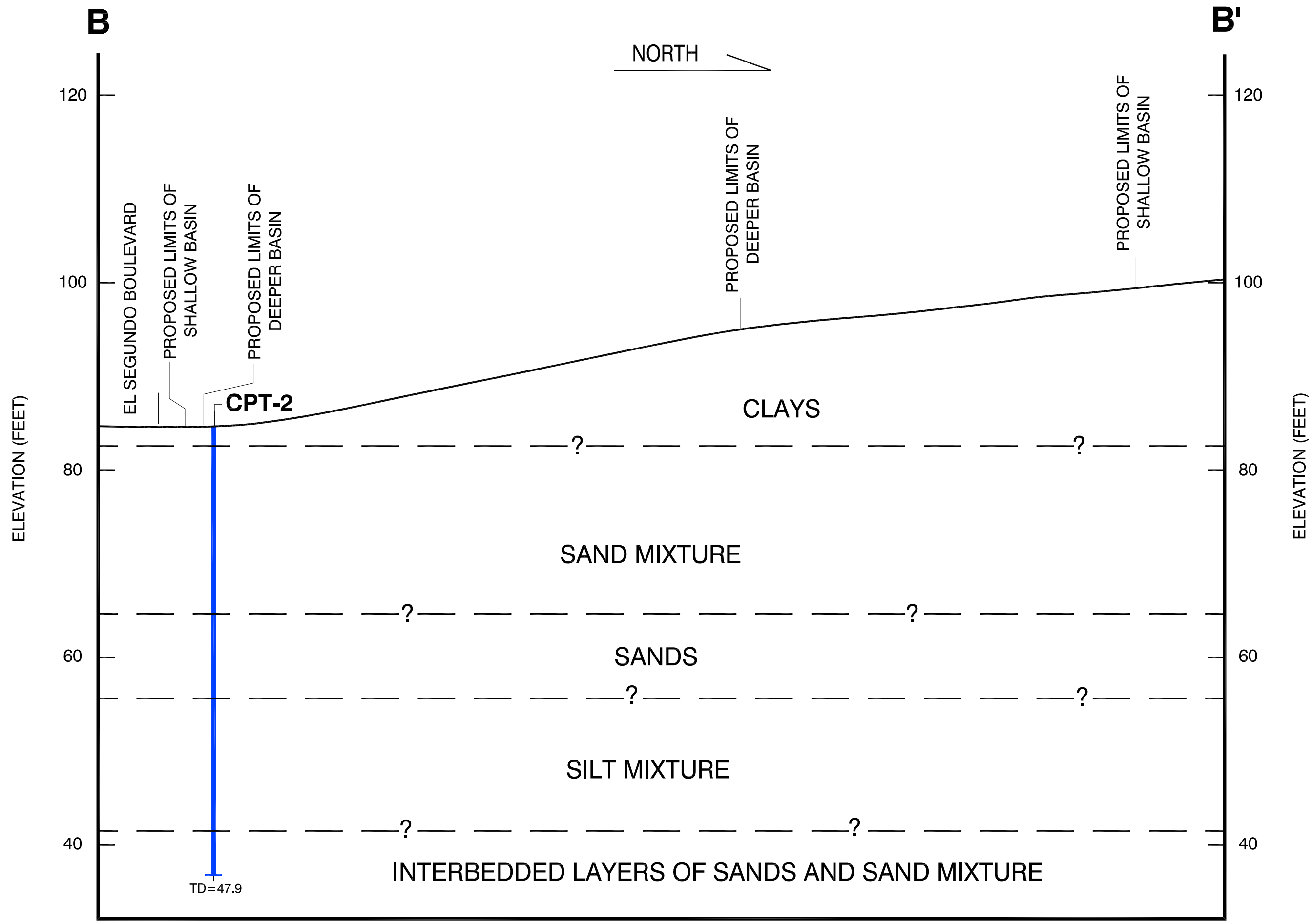

LEGEND

— — ? —	GEOLOGIC CONTACT; QUERIED WHERE INFERRED
CPT-2 (TD=47.9)	CONE PENETROMETER; TD=TOTAL DEPTH IN FEET

SCALE IN FEET

Horiz.	0	100	200
Vert.	0	20	40

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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CROSS SECTION B-B' - CHESTER WASHINGTON GOLF COURSE (SOUTH)

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE

9

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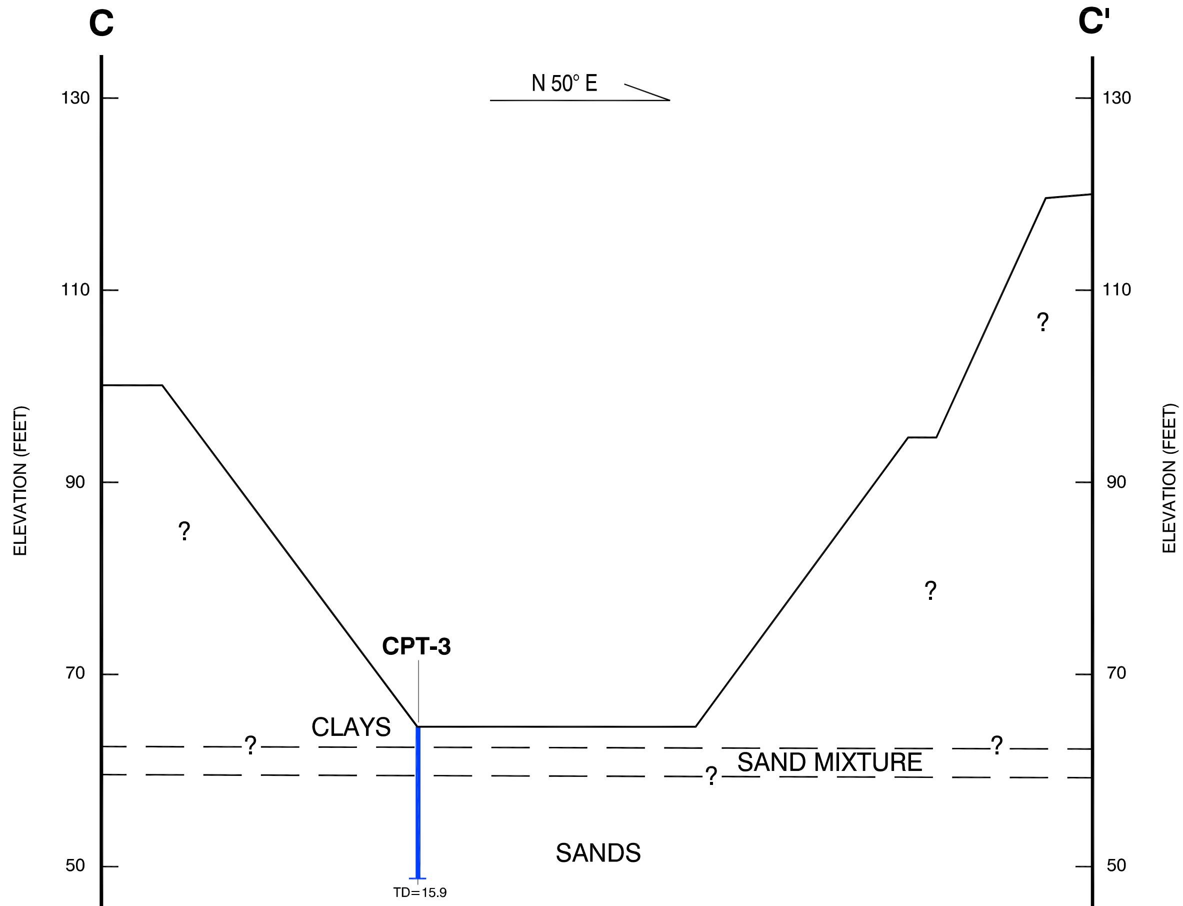

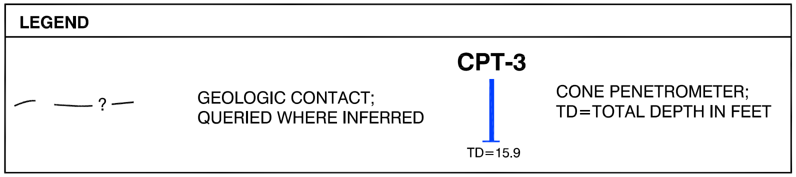

SCALE IN FEET

Horiz.	0	100	200
Vert.	0	20	40

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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CROSS SECTION C-C' - EL SEGUNDO BASIN

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

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FIGURE

10

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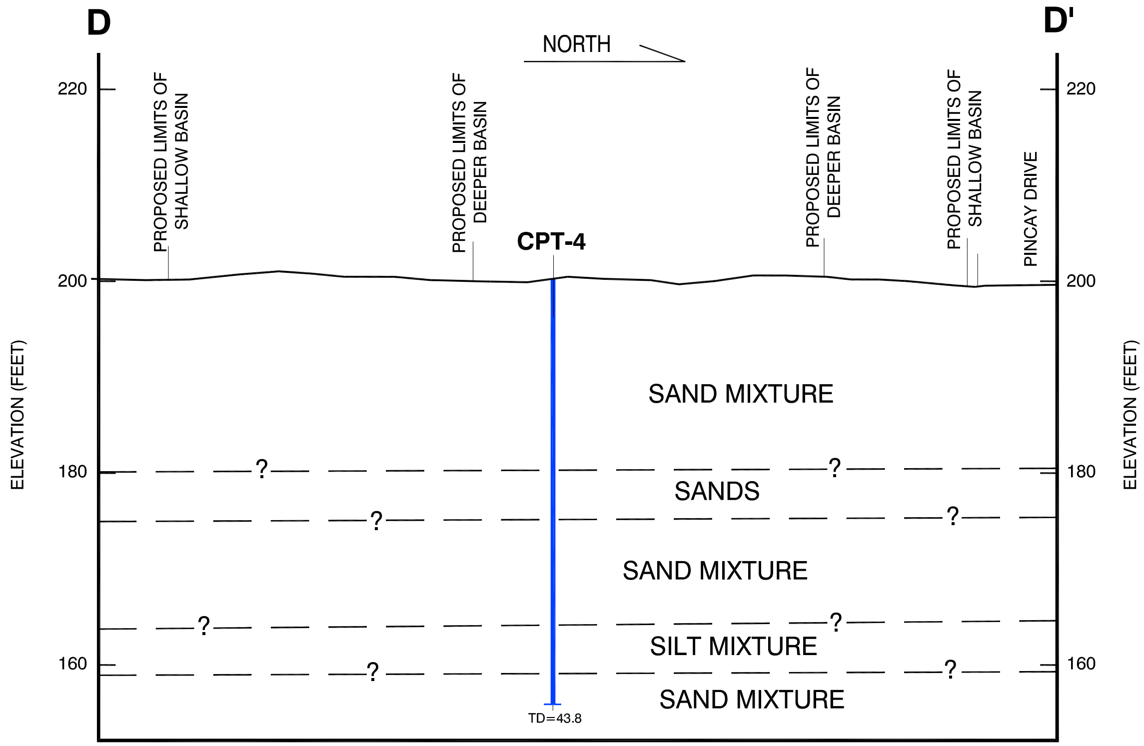

LEGEND

— — ? — GEOLOGIC CONTACT; QUERIED WHERE INFERRED	CPT-4 (TD=43.8) CONE PENETROMETER; TD=TOTAL DEPTH IN FEET

SCALE IN FEET

Horiz. 0 100 200
Vert. 0 20 40

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore		CROSS SECTION D-D' - DARBY PARK	FIGURE
PROJECT NO.	DATE	DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM COUNTY OF LOS ANGELES, CALIFORNIA	11
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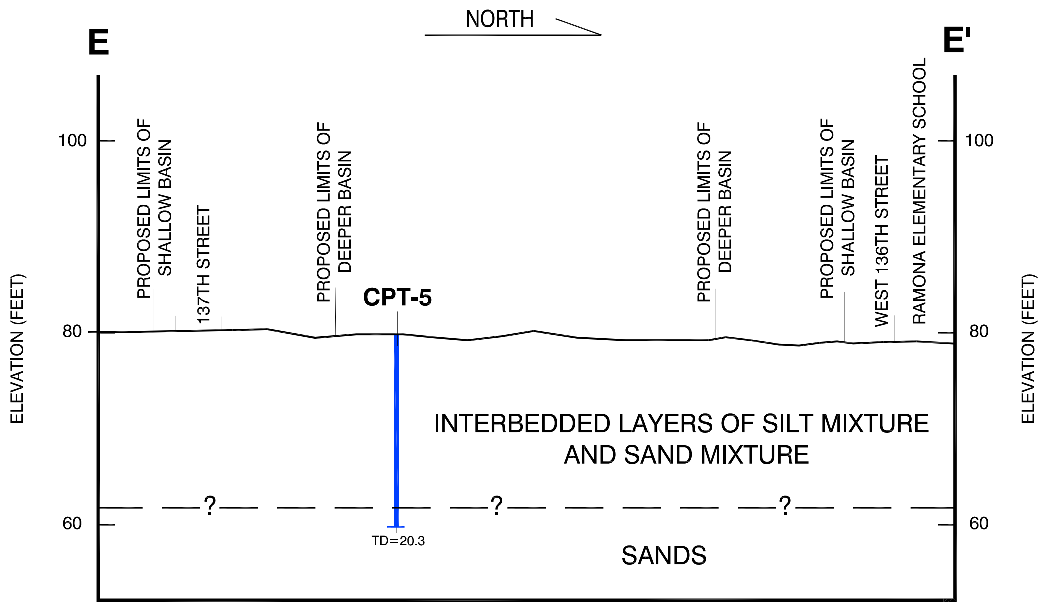

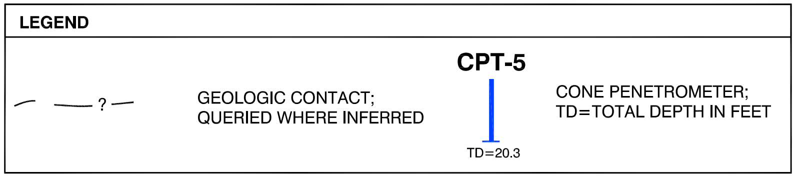

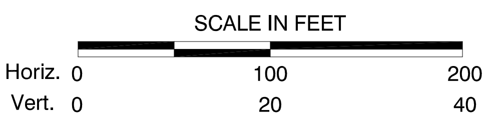

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

PROJECT NO.	DATE
209077001	5/15

CROSS SECTION E-E' - RAMONA PARK

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE

12

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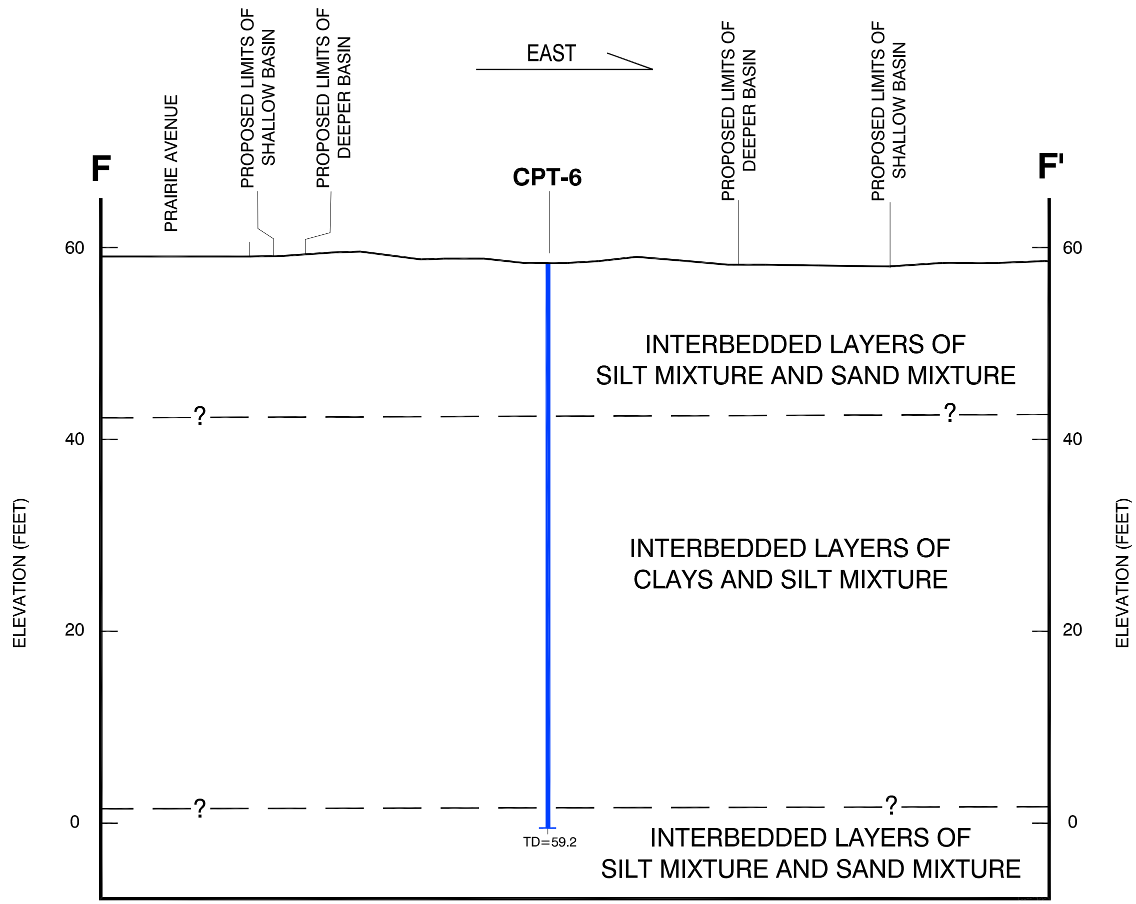

LEGEND

— ? — GEOLOGIC CONTACT; QUERIED WHERE INFERRED

CPT-6 (TD=59.2) CONE PENETROMETER; TD=TOTAL DEPTH IN FEET

SCALE IN FEET

Horiz.	0	100	200
Vert.	0	20	40

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

PROJECT NO.	DATE
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CROSS SECTION F-F' - JIM THORPE PARK

DOMINGUEZ CHANNEL ENHANCED WATERSHED MANAGEMENT PROGRAM
COUNTY OF LOS ANGELES, CALIFORNIA

FIGURE

13

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ATTACHMENT A

CONE PENETRATION TEST DATA

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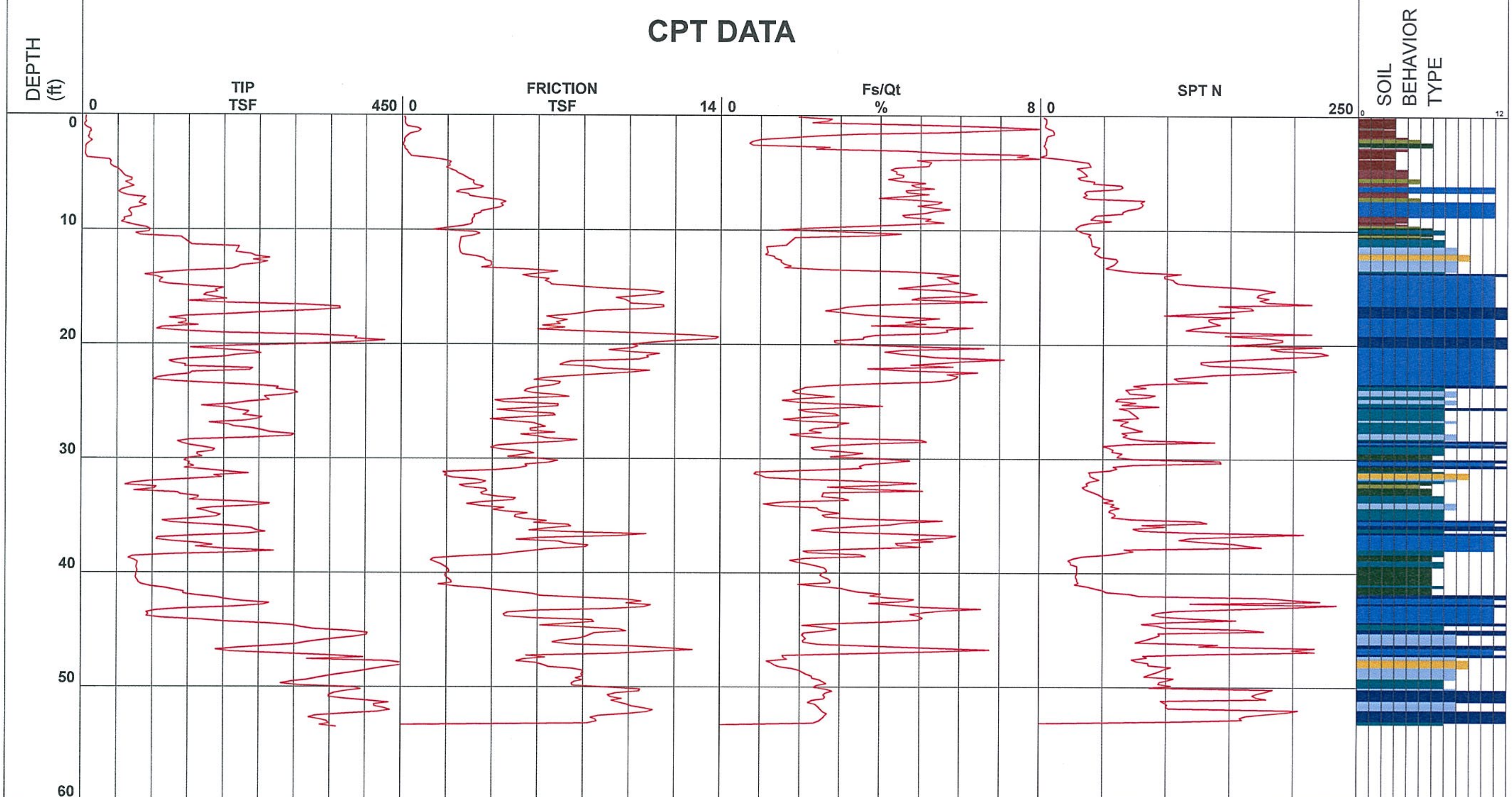
Ninyo & Moore

Project	Chester Washington Golf Course	Operator	RC-BH	Filename	SDF(345).cpt
Job Number	209077001	Cone Number	DSG0906	GPS	
Hole Number	CPT-01	Date and Time	4/2/2015 8:10:19 AM	Maximum Depth	53.48 ft
EST GW Depth During Test	>53.48 ft				

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

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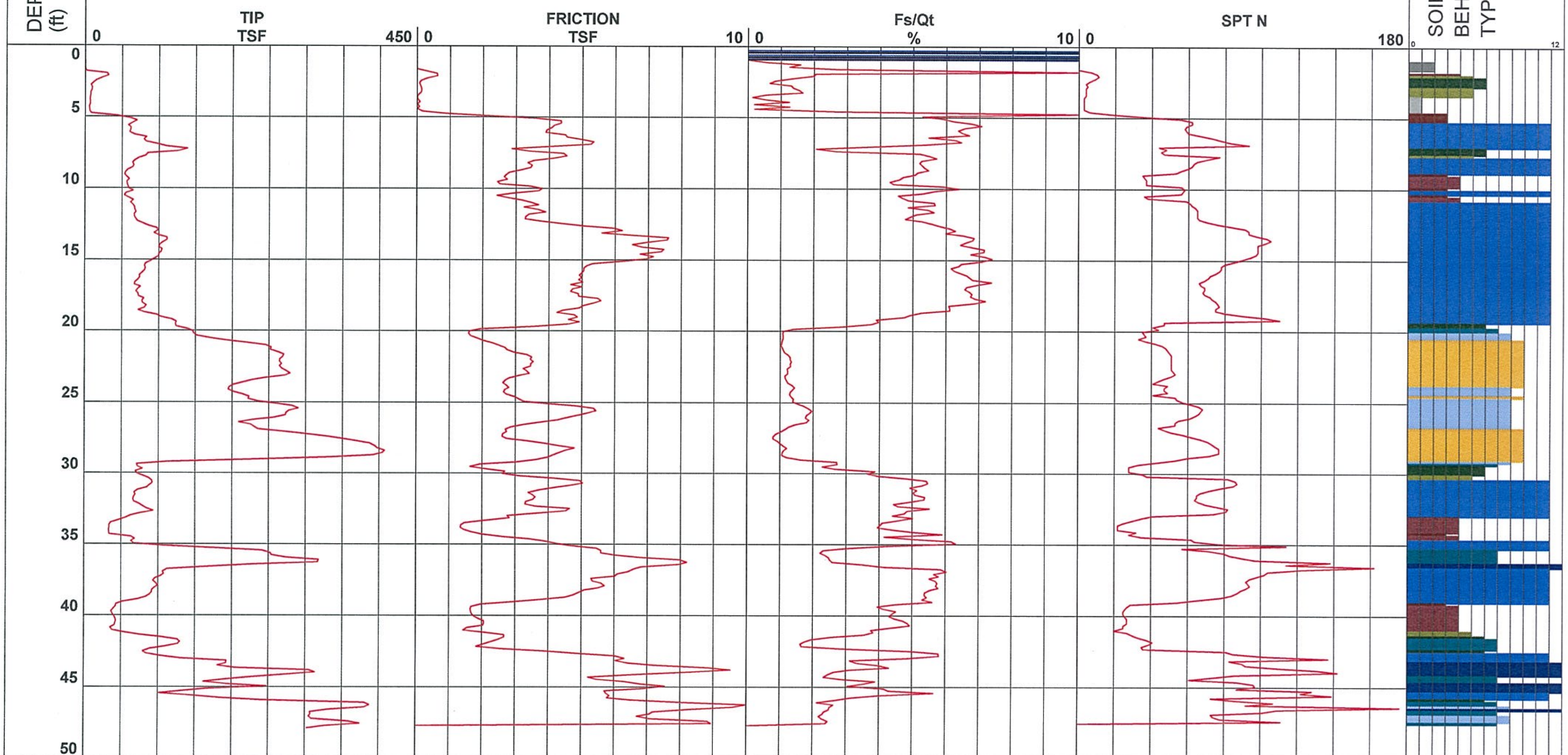
Ninyo & Moore

Project	Chester Washington Golf Course	Operator	RC-BH	Filename	SDF(346).cpt
Job Number	209077001	Cone Number	DSG0906	GPS	
Hole Number	CPT-02	Date and Time	4/2/2015 10:04:50 AM	Maximum Depth	47.90 ft
EST GW Depth During Test		>47.90 ft			

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

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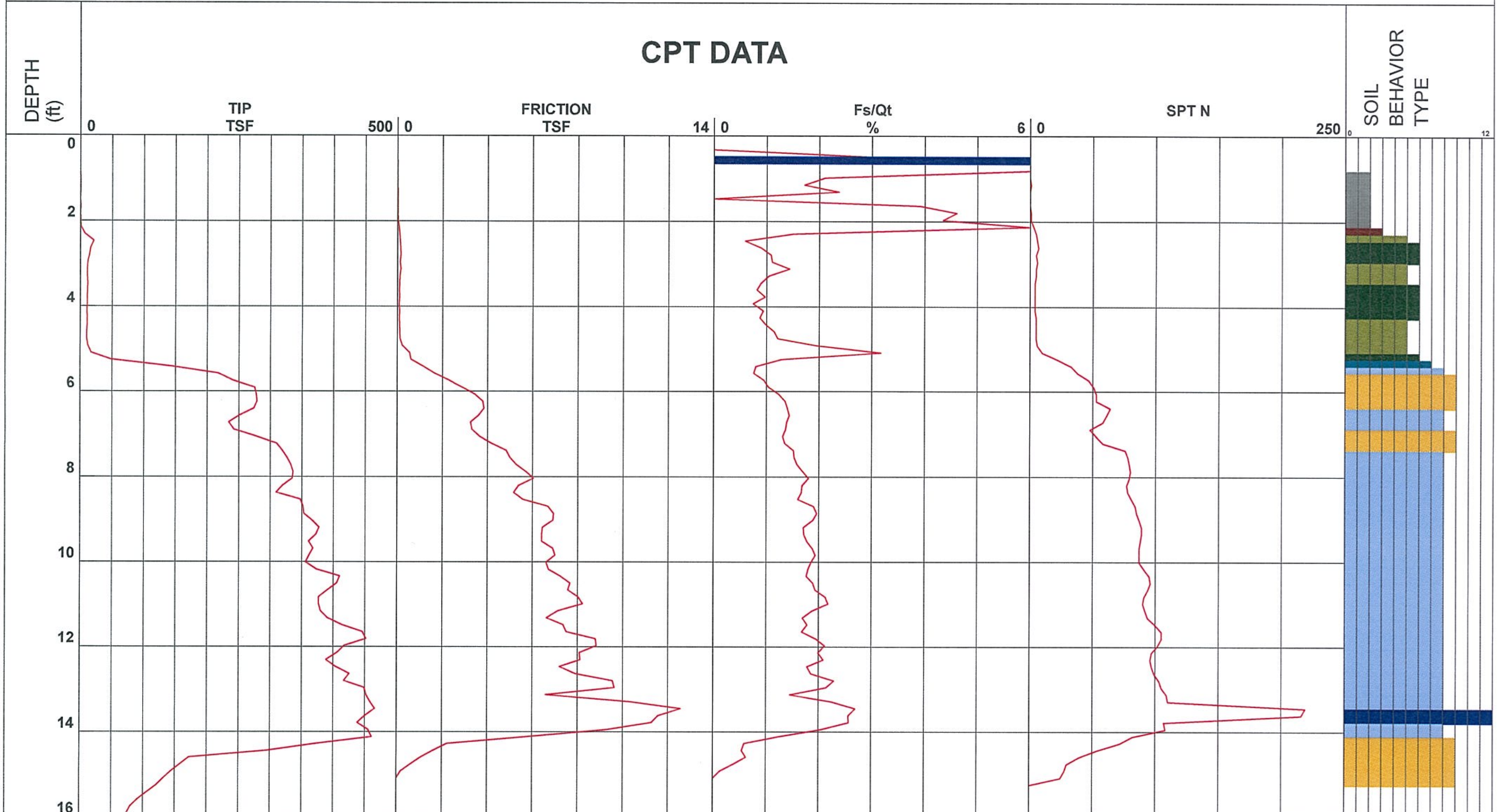
Ninyo & Moore

Project	El Segundo Project Site	Operator	RC-BH	Filename	SDF(347).cpt
Job Number	209077001	Cone Number	DSG0906	GPS	
Hole Number	CPT-03	Date and Time	4/2/2015 12:15:03 PM	Maximum Depth	15.91 ft
EST GW Depth During Test	>15.91 ft				

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

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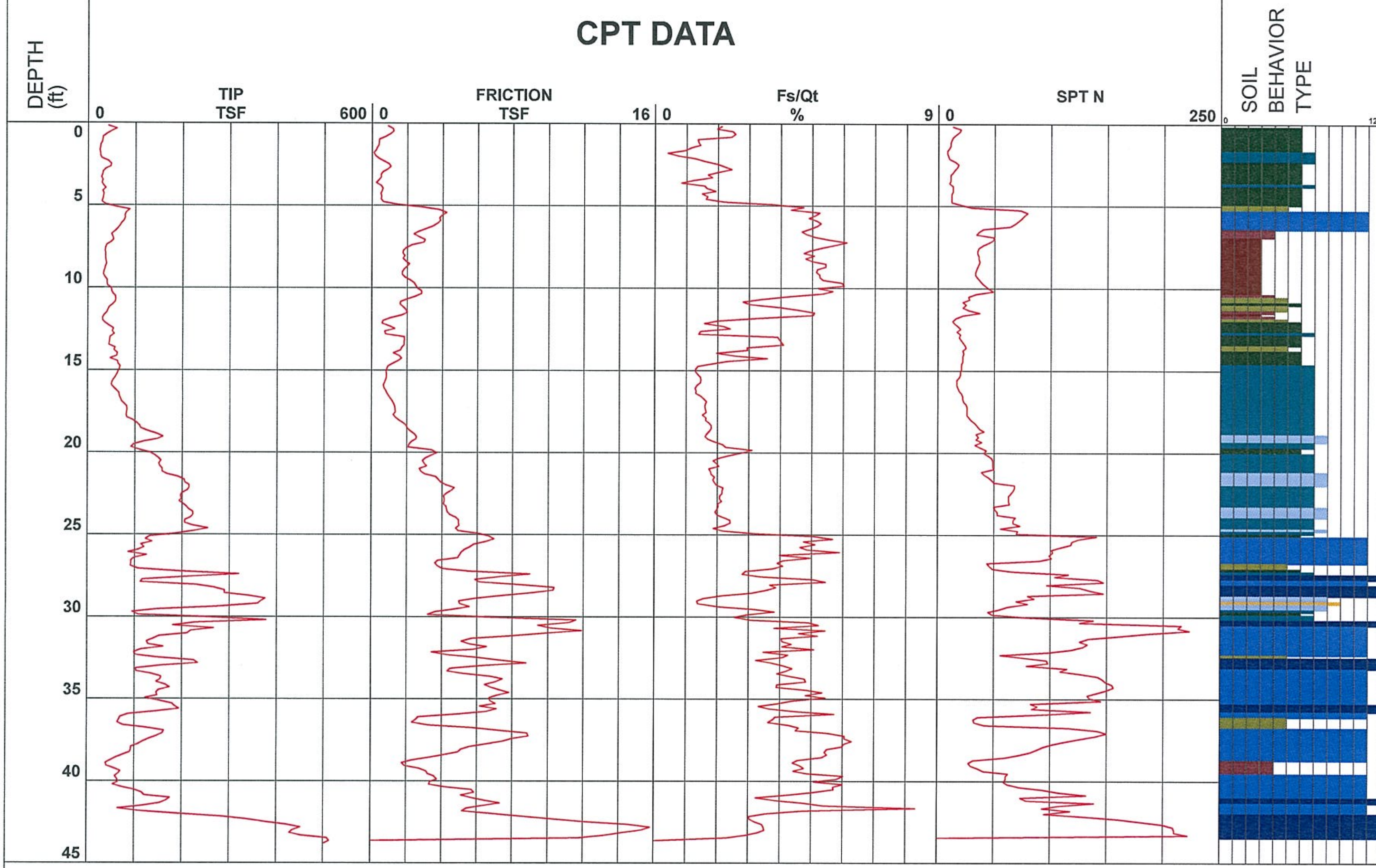
Ninyo & Moore

Project	Darby Park	Operator	RC-BH	Filename	SDF(363).cpt
Job Number	209077001	Cone Number	DSG0906	GPS	
Hole Number	CPT-04	Date and Time	4/13/2015 2:26:45 PM	Maximum Depth	43.80 ft
EST GW Depth During Test		>43.80 ft			

Net Area Ratio .8



REMARKS

Hand Auger to 5'

1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

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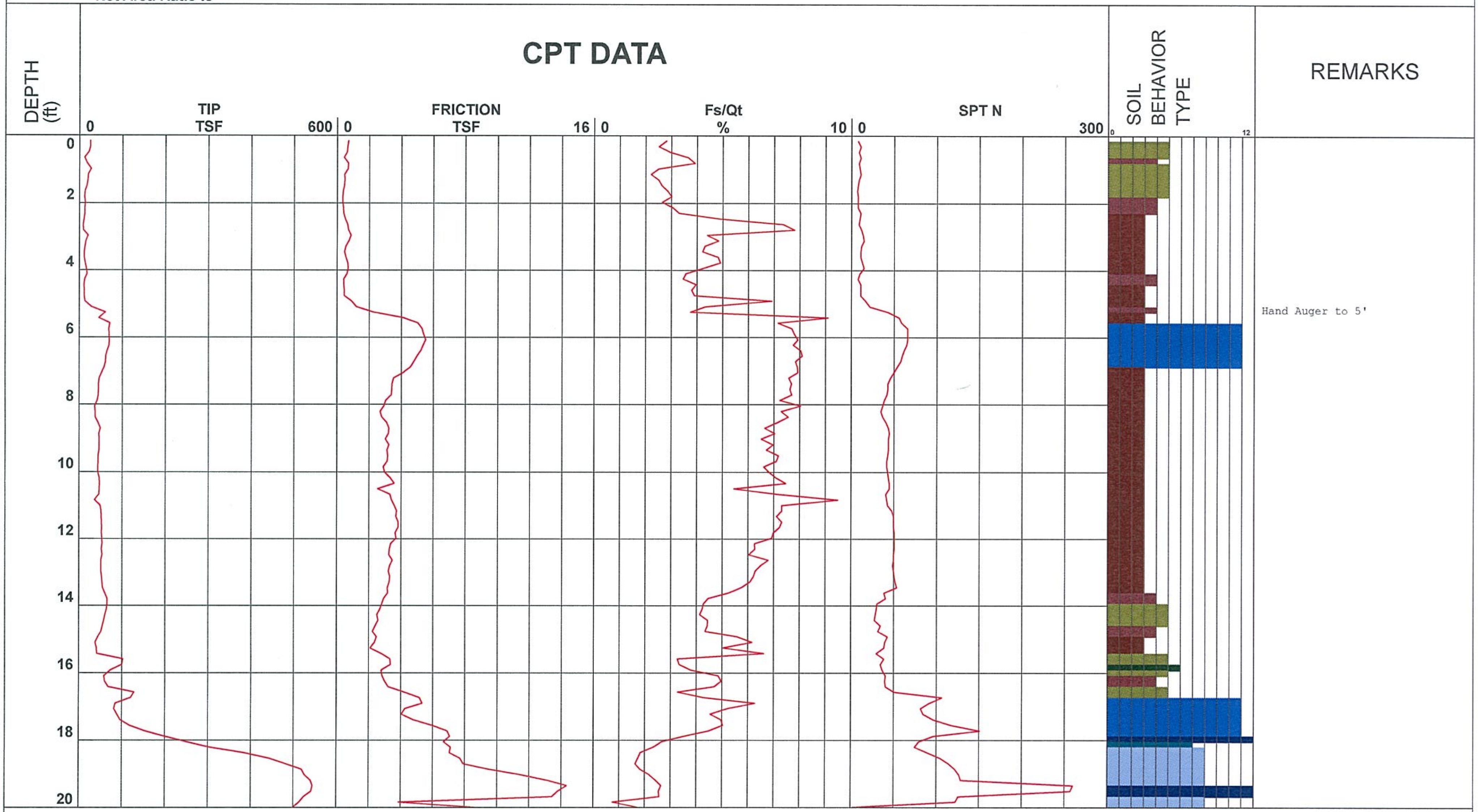
Ninyo & Moore

Project	Ramona Park	Operator	RC-BH	Filename	SDF(364).cpt
Job Number	20907700101	Cone Number	DSG0906	GPS	
Hole Number	CPT-05	Date and Time	4/13/2015 4:31:08 PM	Maximum Depth	20.34 ft
EST GW Depth During Test		>20.34 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

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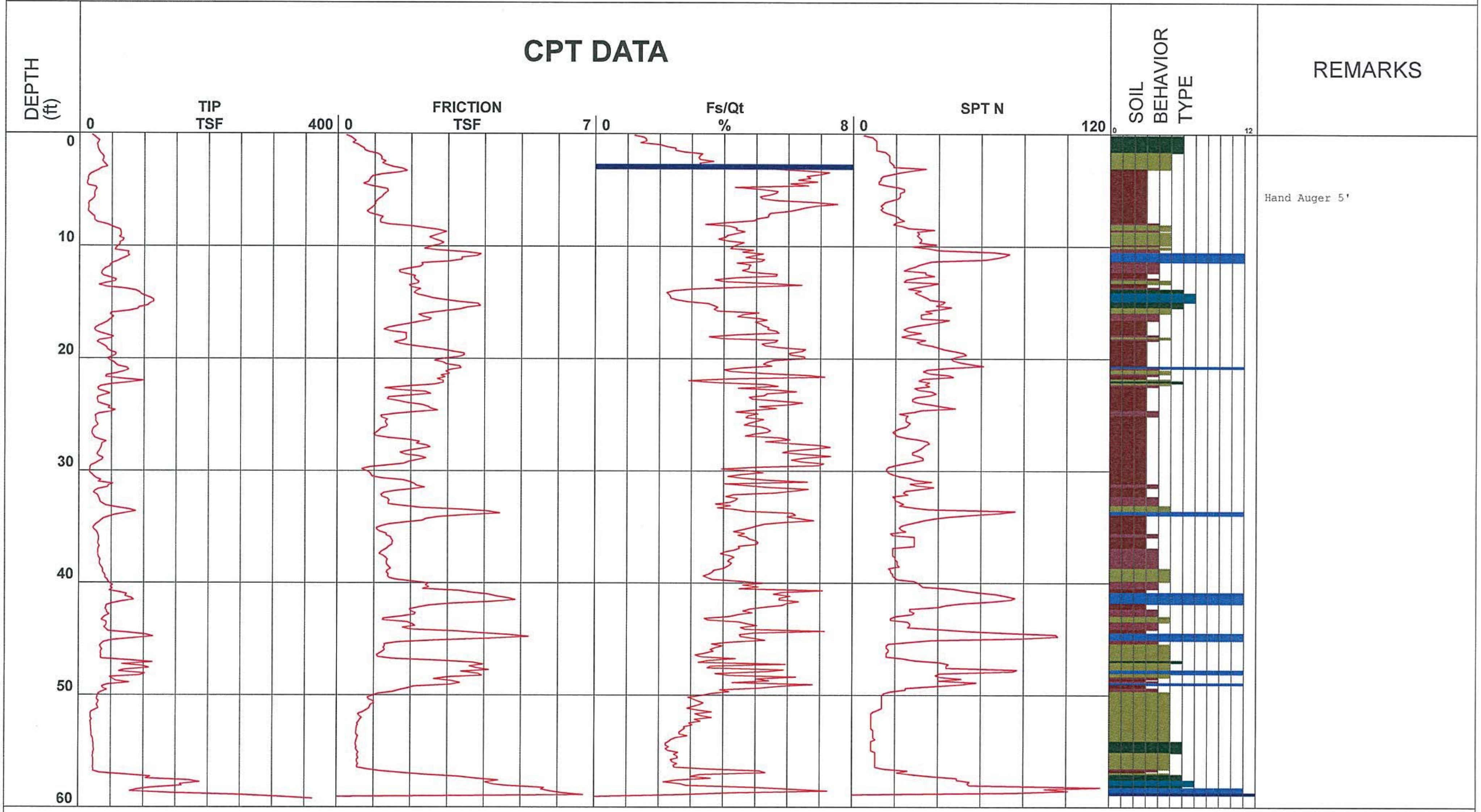
Ninyo & Moore

Project	Jim Thorpe Park	Operator	RC-BH	Filename	SDF(384).cpt
Job Number	209077001	Cone Number	DDG1281	GPS	
Hole Number	CPT-06	Date and Time	4/20/2015 10:52:26 AM	Maximum Depth	59.22 ft
EST GW Depth During Test	>59.22 ft				

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

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Attachment R

Green Streets TM

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1 Distributed Project (Green Streets)

A green streets analysis was performed for the DC WMG area to determine which streets are most suitable for green street implementation[1]. The following criteria were examined and ranked to establish a green street implementation hierarchy:

1. Slope
2. Soil infiltration capacity
3. Street type

Each criterion was analyzed based on the methodology described below. A ranking system was developed, which was used to classify streets in terms of their potential as green streets (high, medium, or low). The analysis was performed using ArcGIS and Microsoft Excel. Once the streets were ranked for their feasibility as green streets, a subarea analysis was conducted to determine which streets within each subarea would need to be implemented as a green street to satisfy the 85th percentile storm event volume criteria and the 90th percentile load criteria.

Slope

Streets with milder slopes are more appropriate for green streets as they are able to provide a greater capacity than streets with a steeper slope. The slope of each street within the DC WMG was determined by first creating a raster defining the slopes throughout the area using a contour shapefile. The raster was then converted into a shapefile so that a slope could be assigned to each street. The streets were then ranked based on the slope values as described in **Table 1-1**. **Figure 1-1** illustrates the slopes found within the DC WMG.

Table 1-1 Slope Ranking Summary

Slope (%)	Ranking Value
0	10
1	8
2	6
3	4
4	2

*Note: Streets with slopes above 4% were excluded from the analysis.

[1] The Cities of Carson and Lawndale were not included within this analysis as those cities were added to the DC EWMP at a later time (August 2015) within the planning process. See Attachments Z and AA for more information on the green street analyses for Carson and Lawndale within the DC EWMP.

Soil (Infiltration Capacity)

The soil type along each street was determined and the associated infiltration capacity (Ksat) was used to rank the streets. The streets with underlying soils with a higher infiltration capacity were assigned a higher score as these streets would offer more of a benefit as green streets than streets whose underlying soils are not conducive to infiltration. The soil types were determined based on the Los Angeles County Hydrology Manual (2006) soil types and the associated infiltration capacities are based on the Structural BMP Prioritization and Analysis Tool (SBPAT). Each street was clipped using the soil shapefile, so that street segments did not cross multiple soil types, and were assigned a ranking value based on **Table 1-2**. **Figure 1-2** illustrates the soil types found within the DC WMG.

Table 1-2 Soil Ranking Summary

Soil Type	Infiltration Capacity (Ksat)	Ranking Value
14	0.81	10
3	0.77	9
10	0.74	8
15	0.72	7
13	0.45	6
4	0.40	5
16	0.36	4
6	0.33	3
9	0.27	2

*Note: Soil types with an infiltration capacity lower than 0.36 were excluded from the analysis.

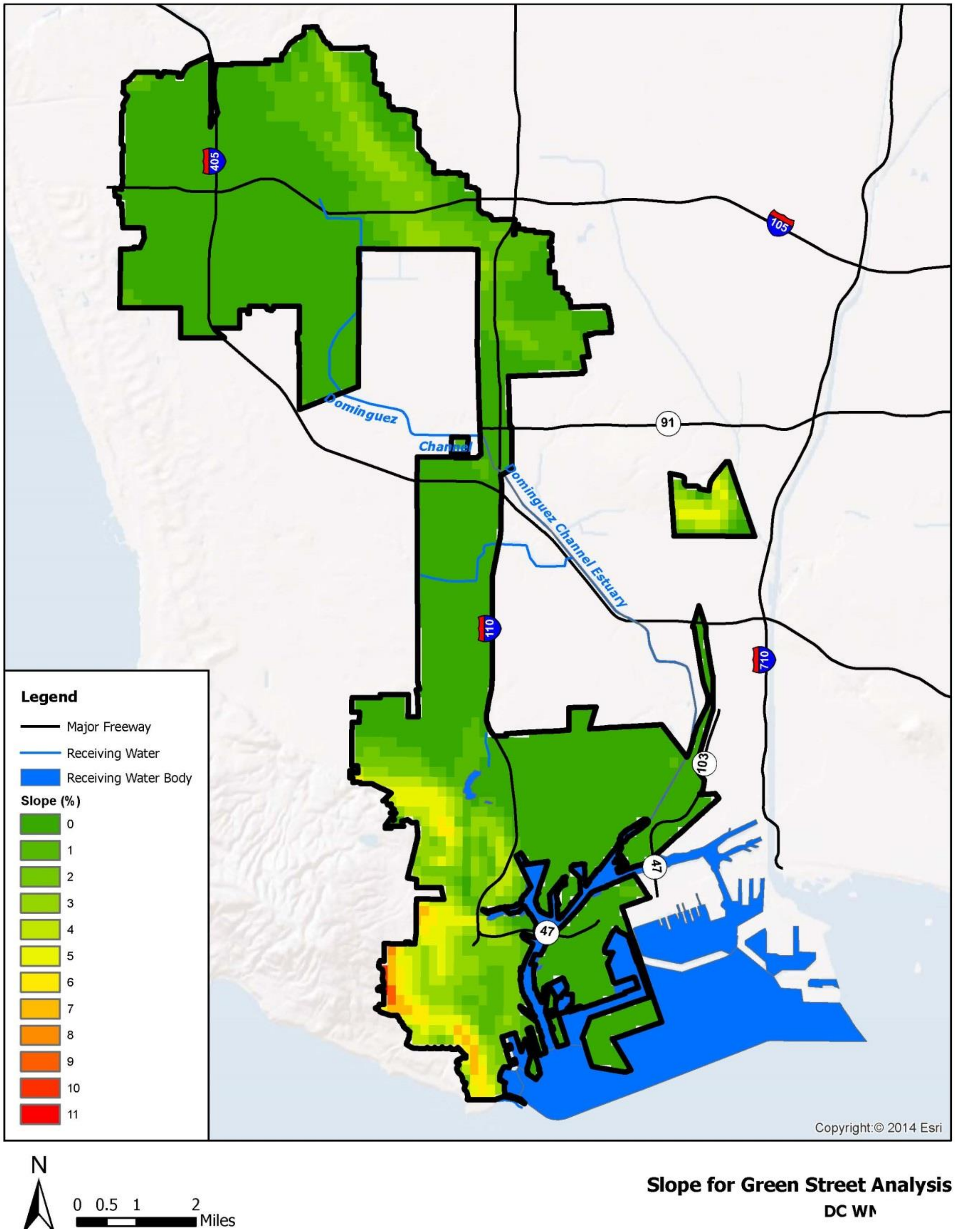

Figure 1-1 Slope for Green Street Analysis

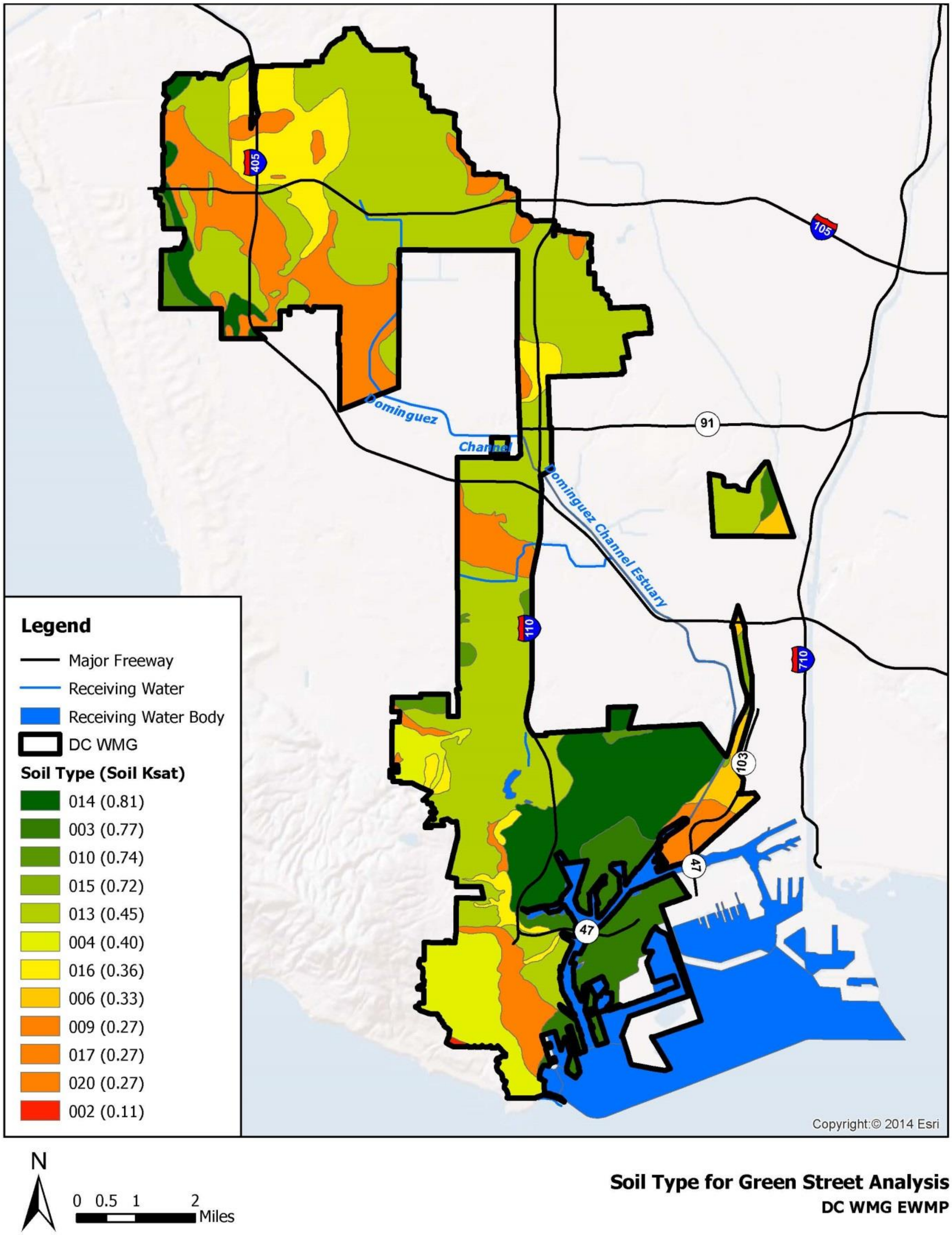

Figure 1-2 Soil for Green Street Analysis

Street Type

The street type was used to rank green street opportunities, as different types of streets offer different opportunities. Wider streets, such as major streets, provide a larger area which can be used to treat stormwater. Private streets and major freeways are some examples of streets that do not provide feasible opportunities. The Countywide Address Management System (CAMS) created a shapefile for street centerlines in Los Angeles County based on the 2010 TIGER roads file developed by the Census Bureau. The CAMS shapefile includes attributes, such as street type, which were are not included in the TIGER roads. The attribute in the CAMS shapefile was used to define the street type for the streets within DC WMG. Each street within the DC WMG was classified based on standard street types and were ranked as described in **Table 1-3**.

Table 1-3 Street Type Ranking Summary

Street Type	Ranking Value
Highway and/or Primary-Arterial	10
Secondary-Collector	8
Minor-Local	6
Alley	4

*Note: Street types not included in the list above were excluded from the analysis.

1.1 Green Street Ranking

During the green street analysis, streets were clipped at the jurisdictional boundaries and tagged with the jurisdiction within which it exists. This was not used to rank the streets, but simply to determine what jurisdiction the street was in so that in the future it will be easy to identify the green street needs within each jurisdiction.

After each street was clipped, tagged, and given a ranking value based on the slope, soil, and street type, the score was determined for each street by adding up the value for each of the criteria. The scores ranged from 4 to 30 and were further classified as described in **Table 1-4**. **Figure 1-3** illustrates the green street rankings within the DC WMG.

Table 1-4 Green Street Ranking Summary

Score Range	Green Street Ranking
20-30	High
15-19	Medium
4-14	Low

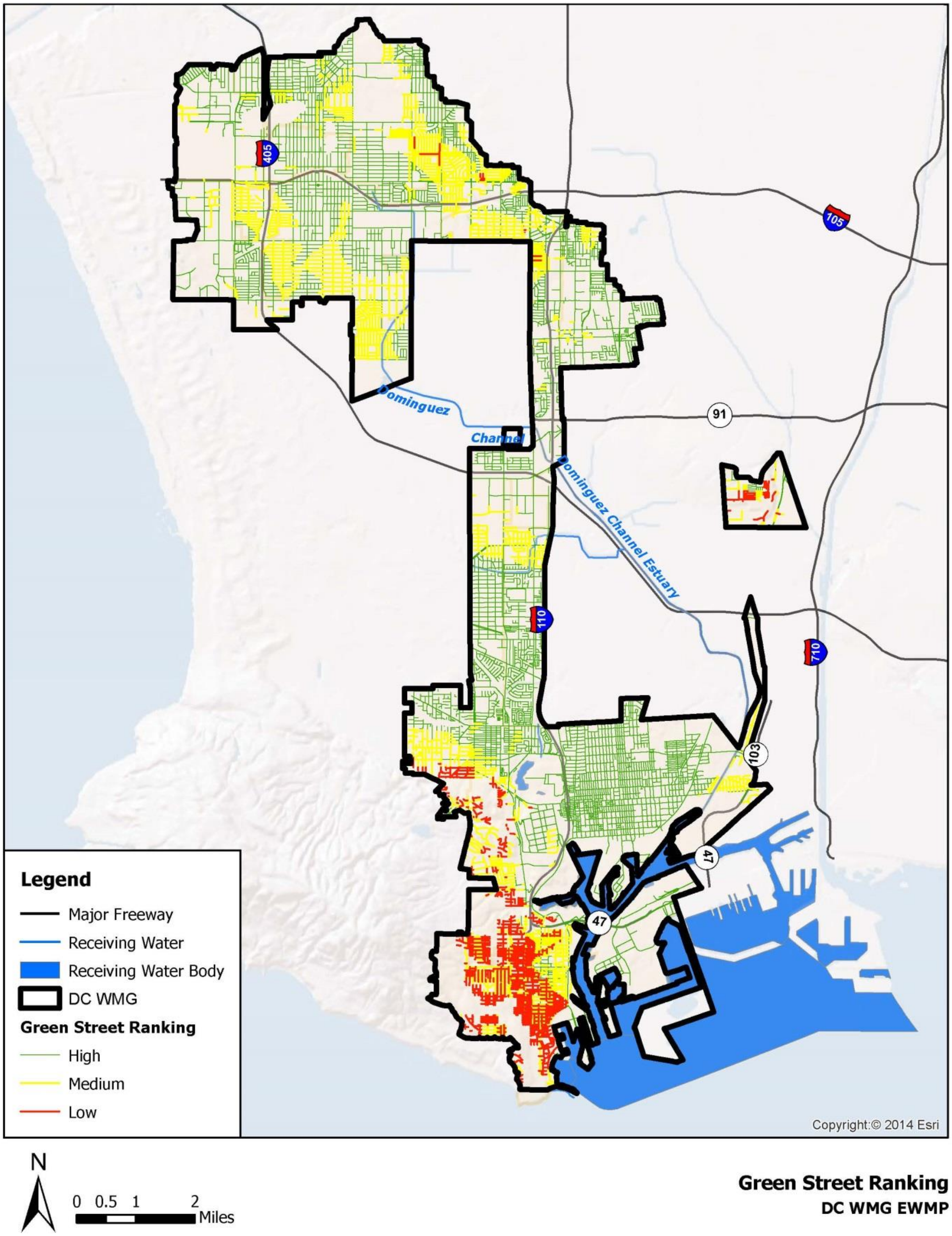

Figure 1-3 Green Street Ranking

Attachment S

Water Rights and Regulatory Challenges Associated with Capturing and Injecting Stormwater in the Dominguez Channel Watershed

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ORANGE COUNTY

PALO ALTO
(650) 320-1500

A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

MEMORANDUM

TO: Richard Haimann, HDR Water Resources Section Manager

FROM: Jeremy N. Jungreis, Senior Counsel, Rutan & Tucker

DATE: February 24, 2015

RE: Water Rights and Regulatory Challenges Associated with Capturing and Injecting Stormwater in the Dominguez Channel Watershed

You have asked Rutan and Tucker ("Rutan") to evaluate whether Cities and other public entities that participate in the Dominguez Channel Enhanced Watershed Management Planning Group ("DC Management Group" or "Group") have the legal ability, individually or collectively, to obtain additional water rights as result of captured stormwater projects associated with implementation of the Enhanced Watershed Management Plan ("EWMP") in the Dominguez Channel Watershed. If so, you have queried whether the DC Management Group can anticipate obtaining the necessary regulatory approvals to inject captured stormwater in the Dominguez Channel Watershed. Finally, you have inquired on the likely legal costs associated with both the water rights and regulatory approval processes. This Memorandum responds to all of the issues you asked Rutan to address.

I. <u>Brief Background of the Water Rights and Allowable Pumping Allocations of the Groundwater Aquifers to Which Collected Storm Water Could be Injected</u>.

California has a highly complex system for allocating water that combines elements of water rights systems found in the Eastern United States — rights that primarily are attached to land ownership (riparian and overlying water rights), with Western allocation regimes (appropriative rights) that are based on the date when water was first put to beneficial use by a user. In addition, California recognizes a unique water right, the Pueblo Water Right, which is derived from the water rights of historic Mexican Pueblos when California obtained statehood. The only two cities to obtain judicial recognition of a Pueblo Right are the cities of Los Angeles and San Diego. Since the City of Los Angeles is a member of the DC Management Group, Pueblo Rights are a potential consideration. However, as explained further below, given Los Angeles' participation and judicial stipulation to a specific allocation of water rights in the West Coast and Central Groundwater Basin Adjudications, the Pueblo Rights issue is not directly raised in the Dominguez Channel Watershed, and as such, is discussed only briefly in this memorandum. Suffice it to say, Pueblo Rights, which are the most "senior" of all water rights in California, would be potentially powerful leverage for obtaining additional allocations if the normal process specified in the pertinent judgments does not yield additional rights for Los Angeles, individually, or as a member of the Group.

California allows the combination of various water rights in the groundwater adjudication context if parties stipulate to the same priority of water right as a part of the implementation of a physical solution for the entire basin. In a groundwater adjudication, all parties claiming a water right in a particular groundwater basin are typically joined as parties before one court. The court then determines the relative priorities and rights to take a particular volume of water from the groundwater basin. Where all of the parties stipulate to a physical solution, the court can choose to accept the stipulation and adjudicate the stipulated rights of all of the parties before the court. That is what happened in the two groundwater basins of relevance here, the West Coast[1] and Central[2] Groundwater Basin Adjudications. In both adjudications, all of the pumpers stipulated not to exceed a set annual pumping allocation ("APA") except in accordance with the respective judgment, thereby consenting to a water right of equal priority with those of other water users. Most potential injection sites within the EWMP planning area would appear to lie within the West Coast Groundwater Basin, with some sites potentially in the Central Groundwater Basin, with final determination of the appropriate basin for injection contingent upon the boundaries of the Dominguez Channel Watershed as well as the jurisdictional boundaries of project participants. Accordingly, the water rights discussion herein will primarily be focused on the requirements for developing "new water" under the West Coast Judgment — with differences in the similar Central Basin Judgment identified where appropriate.

To obtain an increased APA associated with injected stormwater in an adjudicated groundwater basin, a project proponent must first answer the following questions:

Question 1: Is captured stormwater injected truly ***new water***?

Question 2: Is safe yield of the Basin increased as a result of the injection of the new water?

Question 3: Does the pertinent stipulated judgment allow for project participants to get "credit" in the form of an increased APA?

As explained in more detail below, if designed properly utilizing the steps identified in the West Coast (and/or Central) Basin Judgment, injected stormwater captured in the EWMP

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1 The West Coast Basin was adjudicated in 1961 and amended in December 2014 in the case of *California Water Service Company et al. v. City of Compton, et al.*, Los Angeles Superior Court No. 506806. ("West Coast Basin Judgment" or "Judgment" as used herein).

2 The Central Basin was adjudicated in 1965 in the Case of *Central and West Basin Water Replenishment District v. Adams et al.*, Los Angeles Superior Court Case No. 786656 ("Central Basin Judgment"). The Central Basin Judgment was amended to address storage and augmentation issues in December 2013.

service area could be considered "new water" because it would otherwise flow to the ocean or percolate to a non-usable shallow aquifer in the absence of projects associated with the EWMP. Assuming the DC Management Group member cities are able to demonstrate the injection project(s) result in increased yields in one or both groundwater basins of interest, it is probable that project participants can obtain a water right to pump additional groundwater in excess of existing APAs.

II. **The Steps Necessary to Acquire Additional Pumping Allocations Based on the Water Added to the Groundwater Aquifer(s).**

The West Coast Basin Judgment

Due to growth in the Los Angeles area in the early 1900s and advancement of technology that made groundwater extraction quicker and more efficient, groundwater extracted from the West Coast and Central Basins began to exceed the natural replenishment of the Basins. Low levels in the Basins led to a deterioration in water quality, due to sea water intrusion and the effects of urbanization. In 1945, a lawsuit was filed by multiple water providers to quiet title to the groundwater rights of each pumper in the West Coast Basin, and to establish control over groundwater extractions from the Basin. After many years, the Court signed a final judgment in 1961. The original judgment has since been amended five times, with the most recent amendment approved by the Court in December 2014 after years of negotiations. The sections below provide information on the basic structure established by the West Coast Basin Judgment and a detailed account of the terms of the Judgment most relevant to injection projects associated with the nine potential replenishment sites identified by HDR and the Group.

The Watermaster

The Watermaster for the West Basin consists of three distinct bodies — the Administrative Body, the Water Rights Panel and the Storage Panel — each with different powers, duties and responsibilities.[3] The Administrative Body of the Watermaster is the Water Replenishment District of Southern California ("WRD"), a Special Act District charged by statute with responsibility for managing and replenishing the West Coast and Central Basins. The Water Rights Panel in the West Coast Basin is a group of five representatives, with three of those representatives being the President, Vice President and Treasurer of the West Basin Water Association,[4] and the other two representatives being selected by the Board of Directors of the

---

[3] *See* Section XI of the Judgment for the specific powers, duties and responsibilities assigned to each body.

[4] The West Basin Water Association is an association of the major pumpers with water rights in the West Coast Basin, and is the successor to the group that first initiated the West Coast Basin litigation back in 1945. (*See* http://www.westbasinwaterassociation.com/ for history and

West Basin Water Association. The Storage Panel is made up of two separate bodies, the Water Rights Panel and the WRD Board of Directors.

The Water Replenishment District

In addition to acting as the Administrative Body of the Watermaster, WRD is charged with replenishing groundwater in the West Basin in accordance with the Water Replenishment District Act (Cal. Water Code § 60000 *et seq.*). Water replenished by WRD is available for extraction by parties to the Judgment based on their allocated production rights. To facilitate WRD's Basin operations, the Judgment allocates WRD 49,100 acre-feet ("af" or "afy") of storage space to WRD as a Basin Operating Reserve that WRD may use in accordance with the WRD Act.[5]

The Court

The Court is the ultimate overseer of the activities in the West Basin under the West Coast Basin Judgment. It has express continuing jurisdiction over such matters.[6] In addition to hearing complaints filed by parties to the Judgment and appeals of decisions made by the various administrative bodies designated in the Judgment, the Court is authorized to review a variety of matters on its own motion.[7] The Court may, upon its own motion or application by one of the parties to the Judgment, modify or add to the Judgment's provisions, or make any further orders as may be necessary or desirable for the enforcement, protection or preservation of the Basin and the rights of the parties established by the Judgment.

Adjudicated Water Rights and Carryover

The Judgment establishes the amount of groundwater that each party to the Judgment is entitled to extract from the West Coast Basin on an annual basis, referred to as "*Adjudicated Rights*." Pro-rata reductions in the amount of water each party is authorized to extract may be made if required to preserve the West Basin as a common water supply source.[8] Generally, persons or entities that are not party to the Judgment may not extract groundwater from the West Basin. Adjudicated Rights may be transferred, assigned, licensed or leased, upon notice and

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current membership of the Association.) Currently, the President, Vice President and Treasurer of the West Basin Water Association are, respectively, Stephanie Katsouleas (El Segundo), Rob Beste (Torrance), and Tony Olmos (Manhattan Beach). All of the city members of the DC Management Group are also members of the West Basin Water Association.

5 Judgment, § V(1)-(2).

6 Judgment, § XII.

7 *Id*.

8 Judgment, § III(A).

completion of the Watermaster process set forth in the Judgment.[9] As for use of water extracted through Adjudicated Rights, the water must be put to beneficial use by the holders of such rights (or their transferees) through reasonable methods of use and delivery.[10]

The following table sets forth the Adjudicated Rights, as of June 2014, for the cities relevant to the EWMP being developed:[11]

City of Los Angeles	1,503 afy
El Segundo	953 afy
Hawthorne	1,882 afy
Inglewood	4,449.89 afy
Lomita	1,352 afy

If a party does not extract the full amount of water to which it is entitled under its Adjudicated Right in a given year, the party may "carry over" that water for extraction in the following year.[12] The carryover amount is reduced by the amount of water that party has in storage, however, carry-over may not be reduced below twenty percent (20%) of a party's Adjudicated Right.[13] Instead of adding carryover to the allowable extraction for the following year, a party may convert carryover into Stored Water.[14] To do so, a replenishment assessment must be paid to WRD on the amount converted.[15]

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9 Judgment, § IV.

10 Judgment, § III(A).

11 A list of all Adjudicated Rights in the West Coast Basin is attached to this Memorandum as Exhibit A. Note that the other member of the DC Management Group, Los Angeles County, also has a pumping allocation in the West Coast Basin. For example, LA County has an APA of 363.70 AFY for recreational facilities, and the LA County Sanitation District No. 2 has an APA of 102.00 AFY.

12 Judgment, § V(4)(A).

13 *Id*.

14 Judgment, § V(4)(B). Carryover that a party wishes to designate as Storage Water gets allocated to a party's Individual Storage Allocation, if available, and if not, then into Community Pool Storage.

15 *Id*.

Extraction of Water, Generally

Parties with an Adjudicated Right in the West Coast Basin may extract a quantity of water equal to their Adjudicated Amount plus any amount the party holds in storage, and any carryover, with a maximum allowable extraction of 120% of the party's Adjudicated Right unless prior approval of the Storage Panel is obtained.[16] In an emergency, production in excess of a party's Adjudicated Right is permitted in an amount up to two (2) afy or ten percent (10%) of the party's Adjudicated Right, whichever is greater, without court approval.[17] Any greater amount in an emergency situation requires Court approval.[18] The party's Adjudicated Right in the following year is then reduced by the amount of overproduction.[19]

Water extracted is credited to the types of water available to a party in the following order: (1) exchange pool production; (2) carryover water; (3) Adjudicated Right water leased from another party; (4) Adjudicated Right; (5) Stored Water; and (6) emergency production.

Water Augmentation Projects

General Concept

As part of the most recent amendment to the Judgment that occurred in December 2014, provisions were added to the West Coast Basin Judgment to allow for water augmentation projects — projects that provide appreciable increases in long-term annual groundwater yield in the Basin.[20] The most recent amendments recognized that innovations and improvements in management practices that increase the conservation and maximization of the reasonable and beneficial use of water should be promoted.[21] In that vein, the terms of participation in a water augmentation project are at the full discretion of the participating parties and water extraction rights derived from them are accounted for separately from Adjudicated Rights, and perhaps more importantly, they do not carry a requirement to pay a replenishment assessment once new water is introduced and verified.[22]

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[16] Judgment, § IX(1).
[17] Judgment, § V(14).
[18] *Id*.
[19] *Id*.
[20] Similarly the Central Basin Judgment was amended to authorize individual augmentation projects — though with a somewhat more rigorous approval and validation process. Central Basin Judgment §IV (N)(¶¶ 1-6).
[21] Judgment, § V(11)(A).
[22] Judgment, § V(11)(B) & (F); Central Basin Judgment §IV (N)(5).

Water augmentation projects may be proposed by any party and they require approval by the Storage Panel.[23] All parties to the Judgment must be given a reasonable opportunity to participate, albeit on the condition they share proportionately in common costs/benefits and exclusively bear the costs of any improvements required to accommodate their individual needs.[24] The right to water "created" through an augmentation project is apportioned among the participating parties by the Storage Panel (the Judgment does not specify how the proportionate rights are to be determined); parties to the Judgment that do not participate will not obtain rights to any new water created.[25]

Process of Obtaining Additional Extraction Rights

The first step with a water augmentation project is for the party(ies) proposing the project ("Project Leads") to provide advance written notice to all parties to the Judgment, detailing the potential water augmentation project and the proposed terms under which a party may opt-in.[26] In response, any party may indicate its desire to participate.[27] Each participating party must provide written and legally binding assurances that it will bear its proportionate share of the costs attributable to the project, or provide other valuable consideration deemed sufficient by the Project Leads and all participating parties.[28]

Once the project participants are determined, an application must be submitted to the Administrative Body (*i.e.*, WRD) of the Watermaster. With limited exceptions, the Administrative Body is required to do groundwater modeling and technical studies for the proposed project in order to determine if the proposed project is technically feasible and to confirm that it will not cause material physical harm to the Basin. The Project Leads also submit the analyses to the Storage Panel for its review in connection with the proposed project. The costs of the modeling and the costs associated with the processing and review of the application (including any other technical studies) are to be borne by the proponent(s) of the proposed augmentation project.[29] Any party to the Judgment may submit a report or comments on the proposed project,[30] and this process of notice and comment has the potential to add complexity and cost to what would otherwise be a simple augmentation project.

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23 Judgment, § V(11)(E).
24 Judgment, § V(11)(B) & (D).
25 Judgment, § V(11)(H).
26 Judgment, § V(11)(C).
27 Judgment, § V(11)(D).
28 *Id*.
29 Judgment, § V(12)(B)(4).
30 Judgment, § V(12)(B)(5).

With respect to required analysis under the California Environmental Quality Act ("CEQA"), a copy of any public notices required under CEQA must be provided to the Watermaster. The Storage Panel may rely on any CEQA document adopted by a lead agency for purposes of the Watermaster approving the proposed project.

The Judgment requires the Storage Panel to consider a variety of factors during review of the proposed project, including the following: (1) facilities in vicinity of the project; (2) proximity to drinking water wells and depths at which wells are screened; (3) depth at which water will be added; (4) projected resulting groundwater elevations based on groundwater modeling; (5) existing contamination, if any, in the vicinity; (6) preferential groundwater pathways; (7) the project's source of water; and (8) all information provided by any party.[31] The Storage Panel's review must include a public hearing unless it determines that the CEQA document for the project includes the required groundwater modeling, the CEQA document evaluated the above-described factors, and the CEQA document demonstrates that the project is technically feasible and will not cause material physical harm.[32]

In order to approve the project, the Storage Panel must make written findings evaluating the above-listed factors, and concluding that the project is both technically feasible and will not cause material physical harm.[33] Any party may seek reconsideration of the Storage Panel's decision or may request judicial review of it under the continuing jurisdiction of the Court pursuant to procedures found in section XI(4)(D) of the Judgment.[34] Such request for judicial review must generally be brought with 60 days of the Storage Panel's decision.[35]

Post-Approval Matters

For any water augmentation project that is approved, the Storage Panel must impose certain conditions. The conditions include: no extraction under additional rights until new water has actually been introduced into the Basin; regular monitoring to determine the actual amount of new water introduced into the Basin via the project; makeup water, or equivalent payment therefore, required to the extent that the actual water supply augmentation does not meet projections; and water rights derived from the project shall be adjusted to match the actual water "created."[36] The Storage Panel is also required to impose water quality standards for the

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31 Judgment, § V(11)(E). Central Basin augmentation projects follow a similar process—detailed in Central Basin Judgment § IV (¶¶ N-P)
32 Judgment, § V(13)(B)(5). Section II of the Judgment defines the terms "technically feasible" and "material physical harm."
33 Judgment, § V(11)(E).
34 Judgment, § V(13(C).
35 Judgment, § XI(4)(D).
36 *Id*.

augmentation water; however, the Judgment does not specify what those standards must be or the way in which they are to be determined.[37]

Stored Water

Storage Options

The Judgment adjudicates storage space within the West Basin for use by parties to the Judgment and, in certain circumstances, non-parties. The total adjudicated storage capacity is 70,900 af. That total storage capacity is broken down into the following three "levels" of storage: Individual Storage Allocations, Community Pool Storage and Regional Storage.

Individual Storage Allocations are provided to each party to the Judgment in an amount equal to approximately forty percent (40%) of that party's Adjudicated Right.[38] In total, these allocations amount to 25,800 af of the adjudicated storage capacity.[39] A party has a first priority right to its Individual Storage Allocation, and water may be assigned to it through carryover conversion or by other means authorized by the Judgment (e.g., water augmentation project).[40] A party's Individual Storage Allocation is the first "bucket" filled when a party desires to store water.

Community Pool Storage is available on a first in time, first in right basis, with the caveat that party wishing to use Community Pool Storage must first use its entire Individual Storage Allocation. [41] The total capacity allocated for Community Pool Storage is 35,500 af. Once space in Community Pool Storage is used by a party, that specific capacity is "reserved" for that party's use for a period of 24 months after the party withdraws water from its community storage stored water. If the vacated capacity is not completely refilled within that 24-month period, the storage space becomes available for use by another party.[42] If a party maintains water in Community Pool Storage for 10 years or more, and the Community Pool Storage is at least twenty-five percent (25%) occupied, then the party's stored water assigned to Community Pool Storage either becomes water stored in space-available storage or gets deemed "used first" (*i.e.*, extracted water is, for accounting purposes, deducted from the party's community storage amount prior to being subtracted from any other amount available to that party).[43]

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[37] Judgment, § V(13)(B)(7).
[38] Judgment, § V(5)(A).
[39] *Id*.
[40] *Id*.
[41] Judgment, § V(6)(A).
[42] Judgment, § V(6)(C).
[43] Judgment, § V(6)(D).

Regional Storage, which has a total capacity of 9,600 af, is for storage of water pursuant to a Regional Storage Project.[44] Under the Judgment, a Regional Storage Project is a project that does not enhance the West Basin's *long-term* reliable yield and that requires storage capacity in excess of a party's Individual Storage Allocation and the Community Storage Pool capacity.[45] Examples include in-lieu projects, carryover converted to stored water, physical improvement projects, the recharge of "wet water" by spreading or injection, and projects that reduce the overall cost for WRD to perform its replenishment functions.[46] Regional Storage Projects must be approved by the Storage Panel. Although a person or entity that is not a party to the Judgment may propose and/or participate in a Regional Storage Project, if such a non-party's project is approved, that non-party must intervene in the Judgment prior to commencing the project.[47] The Storage Panel is charged with determining the extraction limits for that "non-party."[48]

The Judgment contemplates that some of the above-described storage capacity may go unused by the party or parties with priority rights to use such capacity. It, thus, provides that any unused storage capacity (and any Basin Operating Reserve unused by WRD) may be used by any party with an Adjudicated Right for temporary storage purposes — referred to in the Judgment as "Space-Available Storage." Space-Available Storage may be used without prior approval, however, the party using it assumes all risks of waste and loss.[49] When Space-Available Storage is used, unused storage space is filled in the following order, with the requirement that all capacity in one category be fully occupied prior to moving to unused space in the next category of storage: Individual Storage Allocation, Regional Storage, Community Storage, then the Basin Operating Reserve.[50] Because Space-Available Storage is intended for temporary use, it must be vacated within 90 days if another party wants to make use of such space for its original intended purpose (*i.e.*, Individual Storage Allocation, Regional Storage, or Community Pool Storage uses).[51]

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44 Judgment, § V(7).
45 Judgment, § V(7)(A).
46 Judgment, § V(7)(D). For example, an augmentation project that is too far west to result in an increased basin yield could nevertheless qualify as a Regional Storage Project if it reduces the amount of water that WRD has to obtain for barrier replenishment purposes. At least one of the proposed injection sites proposed by the DC Management Group is in close proximity of one of WRD's seawater intrusion barriers, so characterization of the Project as a Regional Storage Project may be economically advantageous.
47 Judgment, §§ V(7)(B)-(C), (8)(C).
48 Judgment, § V(8)(C).
49 Judgment, § V(10)(A)(1).
50 Judgment, § V(10)(A)(3).
51 Judgment, § V(10)(A)(5)-(6). An exception exists for parties with Adjudicated Rights under 100 afy; such parties may store a maximum of 200 afy. (Judgment, § V(8)(A).)

Storage Limitations and Extraction of Stored Water

The Judgment places limits on the amount of water that may be stored by a party. Specifically, irrespective of the type(s) of storage used, the maximum allowable storage for a given party is an amount equal to two hundred percent (200%) of the party's Adjudicated Right.[52] An additional storage amount equal to fifty percent (50%) of a party's Adjudicated Right is available if the party is using Space-Available Storage.[53] To the extent that a water augmentation project is undertaken, the Storage Panel is charged with determining annual limitations on the amount of stored water and on extraction of stored water.[54]

Importantly, the Judgment expressly states that extraction of stored water, which is defined to include water resulting from an water augmentation project, is <u>not</u> subject to payment of a replenishment assessment.[55]

<u>Suggested Steps for Acquiring Additional Pumping Allocations Based on Groundwater Added to the Aquifer</u>.

The types of projects being considered as part of the EWMP for the DC Management Group — injection of captured stormwater into the Basin for subsequent withdrawal — appears to be the precise type of project contemplated by the December 2014 amendments to the Judgment concerning water augmentation projects. As explained above, the approval of such a project secures to the participating parties an additional water allocation beyond any Adjudicated Rights. Those additional water rights may then be leased, transferred, sold, etc. in the same manner as the Judgment prescribes for Adjudicated Rights. Although all parties to the Judgment must be given an opportunity to participate, meaning they are able to acquire a portion of the additional water rights, there are assurances that any party that opts in must pay their fair share of the project costs which would result in reduced costs for the other participating parties. Additionally, the Judgment is clear that those who do not participate will not be allocated a right to any groundwater resulting from the project.

To avoid the need for the Storage Panel to hold a hearing on a potential project, it is advisable that the CEQA documentation prepared for injection project(s) include groundwater modeling, an analysis of the factors that the Storage Panel is required to consider, and a discussion demonstrating that the project is technically feasible and will not result in material physical harm to the groundwater basin. Doing so will also help to control costs given that any analysis and studies that the Administrative Body and the Storage Panel do with respect to the

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52 Judgment, § V(8)(A).
53 Judgment, § V(8)(B).
54 Judgment, § V(13(B)(7).
55 Judgment, § V(9).

project must be paid for by the project proponents. Incorporation of required modeling and study into CEQA documentation would potentially prevent the same technical work from needing to be performed twice.

All members of the DC Management Group can obtain additional pumping rights in the West Coast Basin since all members of the Group are also parties to the West Coast Basin Judgment. Los Angeles can obtain additional pumping rights in the Central Basin as well. All that is needed is that the project participants for a particular injection site utilize the process laid out in each Judgment for approval of an augmentation project — as such processes were discussed herein.

The more difficult question for DC Management Group Members will be whether the cost of planning, coordinating technical analysis with WRD and the respective Storage Panels, CEQA, environmental permitting, construction, operation and maintenance, and long term administrative costs are justified by the increased pumping allocation associated with a particular inject project over time. The answer will generally depend on how much "new water" is created for each injection site — as allocated across all of the anticipated project costs.

Probability and Costs of Acquiring Additional Pumping Allocations Given the Potential for Claims and Litigation Associated with Taking Those Steps.

It is our view that an augmentation project derived from injection of captured stormwater, if able to demonstrate increased basin yield in either the West Coast or Central Basin, would be able to obtain additional pumping allocations under the respective judgments. Moreover, provided the quality of the injected water did not contain constituents likely to degrade existing supplies of other parties (thereby increasing their respective treatment costs), we believe the risk of significant litigation is not great since the water injected would, as we understand it, otherwise be lost to the productive aquifers in the absence of the augmentation projects. Moreover, any party that wanted to obtain an allocation of new water would have the ability to do so by providing its notice of intent to participate in the proposed project, thereby making it difficult to claim a right to water afterwards having declined to participate when given the opportunity in accordance with the pertinent judgment provisions.

Legal costs are difficult to assess without knowing the scope of the specific project(s) proposed. As previously indicated, it does not appear likely that the proposed projects are likely to lead to litigation — a potentially large multiplier of legal costs and level of effort — but the coordination process with WRD and the Storage Panels will require the assistance of experienced water and environmental attorneys. With litigation, the costs of obtaining the additional allocations could easily exceed one million dollars in legal costs. Without litigation, we would not envision the costs exceeding $50,000 per site, and likely much less per site if all sites under consideration are submitted for Watermaster approval in a programmatic manner supported by a programmatic CEQA document. Additionally, some of the legal costs may be reduced by the use of in-house legal assets — such as those available to the City of Los Angeles.

Proposed Strategy for Securing a Water Agency as a Partner to Secure the Additional Pumping Allocations.

The DC Management Group members, as parties to the West Coast Basin Judgment, are all able to partner with other members of the Group or other parties in the West Coast Basin in the development of augmentation projects involving stormwater injection. If there is a desire to inject water into the Central Basin because of better water quality and usability (without treatment) of injected augmentation project water, the best mechanism that DC Management Group members can likely take is to partner with the City of Los Angeles — which has the right to store water in both basins, and which already has the right to extract its full West Coast Basin APA from the Central Basin — up to 5,000 afy.[56] As previously indicated, partnering with WRD on Regional Storage Projects in the West Coast Basin is also an option that should be explored more fully for possible economic advantage. On the other hand, we believe it would be difficult for any member of the DC Management Group other than Los Angeles to undertake an augmentation project in the Central Basin for meaningful benefit because of the restrictions in the Central Basin Judgment about Central Basin extractions only being used in the Central Basin.[57]

Background and Steps Necessary to Obtain Regulatory Authorization to Inject Stormwater into a Groundwater Aquifer Within the Dominguez Channel Watershed.

The primary state water quality law in California is the Porter-Cologne Water Quality Control Act (PCA) (Water Code §§ 13000 *et seq.*), which was enacted in 1969. The PCA established a State Water Resources Control Board ("SWRCB") and nine Regional Water Quality Control Boards ("RWQCB" or "Regional Boards"), and authorizes them to regulate the waters of the state "to obtain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." (Water Code §§ 13000, 13001.) The RWQCB responsible for regulating the Dominguez Channel Watershed (and all of Western Los Angeles County) is the Los Angeles Regional Water Quality Control Board ("LA RWQCB" or "LA Regional Board").

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[56] Central Basin Judgment § IV (K). All water extracted by Los Angeles from the Central Basin must also be replenished in the Central Basin. (*Id.*)

[57] Central Basin Judgment §§ IV (K)(5); I.C ("Except as expressly authorized herein, or upon further order of the Court, all parties are enjoined and restrained from transporting water extracted from the Central Basin outside the boundaries of the Central Basin Area.")

Under the PCA, any person proposing to discharge water "that could affect the quality of the waters of the state" must apply for Waste Discharge Requirements ("WDR"), which serve as permits for such discharges, from the appropriate Regional Board. (Water Code § 13260(a).) This requirement expressly applies to the proposed construction or operation of an injection well. (Water Code § 13260(a)(3); *see also* Water Code § 13051 [defining injection well].)

The WDR application process begins by filing a Report of Waste Discharge ("ROWD") containing all information required by the Regional Board. (Water Code § 13260(a).) That information includes a "complete characterization" of the proposed discharge including "design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any BMPs used, and a description of disposal methods." (Application/ROWD, p. 7.) It is also recommended that contact be made with the Regional Board staff to discuss the proposed discharge prior to the submission of a ROWD.

Within 30 days of receipt of a ROWD, Regional Board staff will confirm receipt of the application and notify the applicant of any supplemental documents or information required. (*See* ROWD Application Package.) Once the application is complete, the Regional Board determines whether WDRs should be issued, and if so, distributes them to interested agencies and parties for a minimum 30 day comment period. Thereafter, the Regional Board holds a public hearing, at which it may adopt WDRs by a majority vote of the Board. (*See* Water Code § 13263(a) [after any necessary hearing, the Regional Board "shall prescribe requirements as to the nature of the proposed discharge"].)

WDRs must "implement any relevant water quality control plans that have been adopted, and shall take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, the need to prevent nuisance, and the provisions of Section 13241."[58] (Water Code § 13263(a); *see also* Water Quality Control Plan for the Coastal Watersheds of Los Angeles and Ventural Counties [hereinafter "Basin Plan], pp. 4-31.)

Here, the pertinent Basin Plan: (1) designates beneficial uses for surface and ground waters; and (2) sets narrative and numerical objectives that must be attained or maintained to protect those designated beneficial uses. (*See* Basin Plan, p. 1-1.)

The proposed EWMP Planning Area for the Dominguez Channel Watershed, in large measure, overlies the Basin Plan's Los Angeles Coastal Plain, West Coast Basin, which is

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[58] Section 13241 establishes criteria for establishing water quality objectives, while recognizing that "it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses."

expressly designated for Municipal and Domestic Supply ("MUN") use in the Basin Plan.[59] (Basin Plan, pp. 2-30, 2-46.) Moreover, while the Averill Park potential regional project site is in an area that does not appear to be within a specific basin listed in the Basin Plan, the Basin Plan notes that "ground waters outside of the major basins are either potential or existing sources of water for downgradient basins, and as such, beneficial uses in the downgradient basins shall apply to these areas." (Basin Plan, p. 2-46, note ac.) Since the West Coast Basin appears to be downgradient to the Averill Park site, it is assumed to be subject to the same water quality objectives as the other potential sites. (*See also* Basin Plan, p. 5-7 [explaining that, pursuant to State Board Resolution No. 88-63, all waters of the state must be protected as existing or potential sources of municipal water, unless expressly excepted by the Regional Board].)

Thus, the following water quality objectives apply to groundwater beneath all of the proposed injection sites:

- Bacteria: "the concentration of coliform organisms over any seven day period shall be less than 1.1/100 ml." (Basin Plan, p. 3-39.)

- Chemical Constituents and Radioactivity: "shall not contain concentrations of chemical constituents and radionuclides in excess of the limits" in specified sections of Title 22 of the California Code of Regulations. (Basin Plan, pp. 3-39 to 3-40.)

- Mineral Quality: (Basin Plan, pp. 3-40, 3-44.)[60]

    - TDS: 800 mg/l
    - Sulfate: 250 mg/l
    - Chloride: 250 mg/l
    - Boron: 1.5 mg/l

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59 The El Segundo proposed regional project site is near, but just east, of a portion of the basin with no MUN designation.

60 Under certain circumstances the Regional Board may grant a variance from implementing the mineral quality objectives when issuing WDRs. (Basin Plan, p. 3-40.) A variance can only be granted after a public hearing, and may be in place for a maximum of 10 years (5 years, plus one 5 year extension). (*Id*.)

- Nitrogen: "shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO3-N + NO2-N), 45 mg/L as nitrate (NO3), 10 mg/L as nitrate-nitrogen (NO3-N), or 1 mg/L as nitrite-nitrogen (NO2-N)." (Basin Plan, p. 3-41.)

- Taste and Odor: "shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses."

Thus, any WDRs issued to allow discharge of stormwater into the West Coast Basin would have to be protective of all of the above water quality objectives. If the water to be injected complies with such objectives, obtaining WDRs for the proposed injection wells should not be a problem. If not, the Regional Board may require pre-treatment of such water, depending upon whether and the extent to which the proposed discharges would degrade the quality of the basin water. (*See* SWRCB Reso. No. 68-16.) If the water does not comply with Basin Plan Objectives, the discharge will not be permitted absent offsets that — on balance — result in no net increase in the pollutant of concern in the receiving water. (*See* SWRCB *In Re Petition of San Diego Milk Producers Council*, WQO 88-12 at pp.12-14 [pollutant concentrations must not exceed basin plan standards but may be permitted where offsets are utilized or pollutant concentrations are removed through treatment or infiltration process prior to reaching groundwater].) Another option would be to change the Basin Plan objectives in the West Basin, but given the current use of much of the basin for domestic water production, the ability to change such standards in light of the MUN designation would be very limited. (*See id.* at p. 14 [MUN beneficial uses existing near dairies precluded change of basin plan objectives for TDS.])

If the discharge will result in water being injected that is of higher quality than Basin Plan objectives, or the basin otherwise has additional assimilative capacity, then the Regional Board can permit the injection project upon making findings that: (1) the discharge utilizes best practicable treatment or control; (2) a condition of pollution or nuisance will not occur as a result of the discharge; (3) allowing the discharge, notwithstanding allowing some further degradation of otherwise high quality waters, is consistent with maintenance of the highest quality water consistent with the maximum benefit to the people of the state. (*AGUA v. Central Valley Regional Water Quality Control Board* (2012) 210 Cal.App.4th 1255.)

Alternatively, the Regional Board has the authority to waive the requirement that a ROWD be submitted and/or WDRs be obtained "as to a specific discharge or type of discharge if it determines that the waiver "is consistent with any applicable state or regional water quality control plan and is in the public interest." (Water Code § 13269.) Discharges eligible for such waivers must comply with all applicable Water Quality Control Plans. (Basin Plan, p. 4-17.) A waiver may not exceed 5 years in duration, but may be renewed by the Regional Board. (Water Code § 13269(a)(2).)

As previously indicated, to the extent the water quality objectives set forth in the Basin Plan cannot be met, it may be possible to amend the Basin Plan. (*See* Basin Plan, p. 1-4.) A Basin Plan amendment requires a public review and hearing process. (*Id.*) Following adoption by the Regional Board, Basin Plan amendments must be approved by the State Board, as well as the State Office of Administrative Law. Further, amendments that involve changes in state standards must be reviewed by USEPA. (Basin Plan, p. 1-5; *see* also Clean Water Act, § 303(c)(2)(A).)

Additional Regulatory Approvals that May Be Required

EPA Underground Injection Control (UIC) Program

Injection wells are regulated by the US EPA under the Underground Injection Control (UIC) Program. In California, the UIC Program is implemented by US EPA Region 9, for all wells other than "Class II" wells. The EPA has defined five classes of injection wells, "according to the type of fluid they inject and the where the fluid is injected."[61] Stormwater injection wells are considered "Class V" wells, a category that generally includes wells that inject non-hazardous fluids into or above underground sources of drinking water.[62] "Class V storm water drainage wells are 'authorized by rule,' which means they may be operated without an individual permit so long as the injection does not endanger [an underground source of drinking water], and the owner or operator of the well submits basic inventory information about the well to their permitting authority." (*Id.; see* also Inventory Form, available at 2007_12_12_uic_class5_form_uic_7520-16.pdf.) Thus, the UIC Program requirements applicable to stormwater injection wells appear to be minimal. Nonetheless, Region 9 should be contacted during project development in order to confirm there are no requirements other than the submission of an inventory form.

State Water Resources Control Board—Drinking Water Branch ("SWRCB-DB"):

The SWRCB-DB is the entity that previously regulated drinking water within the California Department of Public Health ("CDPH"). SWRCB-DB is heavily involved with the permitting of highly treated sewage that is proposed for use as replenishment water. However, the augmentation projects contemplated by the DC Management Group, as we understand them, do not involve any recycled or reclaimed water, only the use of captured stormwater. As such, none of the injection projects under consideration should require permitting or other approval by SWRCB-DB, and any protection of drinking water that SWRCB-DB might require would presumably be addressed via the LA RWQCB's WDR consideration process given that LA RWQCB is required to protect the MUN beneficial use in any WRD it might issue. That stated,

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[61] *See* www.epa.gov/region9/water/groundwater /uic.html.
[62] *See* http://water.epa.gov/type/ groundwater/uic/class5/types_stormwater.cfm.

any proposed project should be coordinated with SWRCB-DB personnel to ensure they have no objections or desire for participation outside of the CEQA process.

The Probability of Achieving Authorization from the RWQCB to Inject Collected Stormwater into a Groundwater Aquifer.

The SWRCB has stated that they are strongly in favor of stormwater management options that increase local water supplies in the Los Angeles Region. (*See In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit*[63] [Draft Order No. R4-2012-0175, November 21, 2014] at pp. 20-22, 40-42, and 49 ["The alternative compliance path should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply"].) Assuming the constituents in the water to be infiltrated/injected are at or below receiving water limitations in the receiving groundwater, it is very likely that the Project would be permitted by the LA Regional Board — even if the discharge would result in some degradation of receiving water quality. However, to the extent that injected water exceeds pertinent receiving water limitations, permitting would be a much more detailed process requiring demonstration of no impairment of the MUN beneficial use, or the implementation of treatment that would eliminate such impairment prior to injection.

Estimate of Costs for Legal Support to Obtain Authorization from the RWQCB to Inject Collected Stormwater into a Groundwater Aquifer.

Much like the range of potential legal costs for obtaining additional water rights associated with injection of captured stormwater, the potential legal costs associated with permitting of one or more injection projects will vary significantly based upon whether there is opposition to the Project or litigation commenced as a result of permit issuance (or denial). If required WDRs are opposed by third parties, or if the Regional Board staff recommends denial because of failure to meet LA Basin Plan standards, the legal costs (to include the costs of expert and consulting witnesses) associated with obtaining ultimate approval could easily exceed one million dollars. If, however, assimilative capacity exists for all constituents of concern, and no environmental groups or other pumpers challenge the project(s), legal services associated with WDR regulatory permitting could run anywhere from 15,000 to 50,000 dollars depending on the number of sites, the amount of work that can be done through in-house and non-legal resources, and the complexity of the Regional Board hearing.

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[63] This Draft Order, proposed by the SWRCB for statewide applicability, is available online at http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236_draft_order.pdf.

III. **Conclusion**.

As previously discussed herein, injection of captured stormwater is potentially a viable means of achieving additional water rights within the Dominguez Channel Watershed. Both the Central and West Coast Basin Judgments provide specifically for approval of enhanced water rights as a result of augmentation projects developed by parties to one or both judgments. Whether injection projects developed through EWMP implementation are cost effective and viable will depend greatly on the quality of the stormwater captured, the parties participating and their respective resources, and the volume of water proposed for development. On balance, projects that are solely in the West Coast Basin are likely to be easier to permit from a water rights perspective given the somewhat more permissive nature of the West Coast Basin Judgment, as well as the fact that eight of the nine project sites overlie the West Coast Basin. Regulatory approvals from the LA Regional Water Quality Control Board are obtainable, and indeed likely to be supported by Regional Board staff (because of the water supply benefit), if the quality of water to be injected meets or exceeds all water quality objectives in the groundwater basin it overlies.

Hopefully the above analysis will be helpful to you, and all of the members of the DC Management Group, in determining which projects to include as part of the implementation of the EWMP in furtherance of the ultimate achievement of water quality objectives within the Dominguez Channel Watershed.

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EXHIBIT A

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Table 5. Succession of Adjudicated Rights, June 2014 (acre-feet)

ABC NURSERY, INC		
SUCCESSOR TO JENKINS, HARRY C	1.80	
SUCCESSOR TO TITLE, SIDNEY R AND CHARLOTTE W	13.60	
SUCCESSOR TO VERBURG, WILLIAM AND CLARA B	6.70	
SUCCESSOR IN PART TO UNITED CALIFORNIA BANK	2.00	
TOTAL		24.10
ABELL, FRANK	1.80	
SOLD TO CITY OF INGLEWOOD	-1.80	
TOTAL		0.00
ALCAST FOUNDRY, ET AL	7.20	
SOLD TO CITY OF TORRANCE	-7.20	
TOTAL		0.00
ALLIED CHEMICAL CORP		
(SEE INDUSTRIAL CHEMICAL DIVISION, ALLIED CHEMICAL CORP)		
ALLIED CORP		
(FORMERLY: ALLIED CHEMICAL CORP)		
(NOW KNOWN AS ALLIED-SIGNAL, INC (EL SEGUNDO OFFICE))		
ALLIED-SIGNAL, INC (TORRANCE OFFICE)		
SUCCESSOR TO GARRETT CORP, THE	22.50	
(MERGED WITH HONEYWELL INTERNATIONAL, INC AND NAME CHANGED TO HONEYWELL INTERNATIONAL, INC)	-22.50	
TOTAL		0.00
ALLIED-SIGNAL, INC (EL SEGUNDO OFFICE)		
(FORMERLY: ALLIED CORP	255.00	
(MERGED WITH HONEYWELL INTERNATIONAL, INC AND NAME CHANGED TO HONEYWELL INTERNATIONAL, INC)	-255.00	
TOTAL		0.00
ALWAG, HILARIO S AND EMMA		
SUCCESSOR TO T C NAVARRO	53.90	
SUCCESSOR TO PEGGY SWICK	5.50	
SOLD TO TORRANCE UNIFIED SCHOOL DISTRICT	-59.40	
TOTAL		0.00
AMERICAN PLANT GROWERS, INC		
SECOND WEST COAST BASIN JUDGMENT	2.60	
SUCCESSOR TO BEN CLUFF DAIRY	7.40	
SOLD TO SUNRISE GROWERS, INC	-10.00	
SUCCESSOR TO SUNRISE GROWERS, INC	10.00	
SOLD TO VUKELICH MIKE, JR.	-10.00	
TOTAL		0.00
ANDERSON, REMBERT C	80.50	
SOLD TO SPARKLETTS DRINKING WATER CORP	-80.50	
TOTAL		0.00
AQUA CAPITAL MANAGEMENT LP		
SUCCESSOR TO ECOGAS	11.80	
TOTAL		11.80
ASAHI FANCY KOI, INC		
SUCCESSOR IN PART TO JAKE ENGELSMA	2.00	2.00
ASSOCIATED SOUTHERN INVESTMENT CO		
(FORMERLY EDISON SECURITIES CO)	46.70	
SOLD TO SOUTHERN CALIFORNIA EDISON CO	-46.70	
TOTAL		0.00
ATLANTIC RICHFIELD CO		
(FORMERLY RICHFIELD OIL CO)	4,428.00	
SUCCESSOR TO MANVILLE SALES CORP	881.00	
SOLD TO TESORO REFINING AND MARKETING COMPANY LLC (6-13-2013)	-5,309.00	
TOTAL		0.00
AUTOMATION INDUSTRIES, INC-HARRIS TUBE		
SUCCESSOR TO HARRIS TUBE, INC	0.70	0.70
BALLMAN, ROSEMARY N	7.00	
SOLD TO UNITED CALIFORNIA BANK	-7.00	
TOTAL		0.00
BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIATION (TRUST BI-51)	0.10	
RELEASED TO MICHAEL L ROCKWELL	-0.10	
TOTAL		0.00
BARCLAY HOLLANDER CORP		
(FORMERLY BARCLAY HOLLANDER CURCI INC)		
SUCCESSOR IN PART TO JOUGHIN TORRANCE RANCH	3.33	
SOLD TO TORRANCE, CITY OF	-3.33	
TOTAL		0.00
BARCLAY HOLLANDER CURCI INC		
(NOW KNOWN AS BARCLAY HOLLANDER CORP)		
BARCLAY, RICHARD AND R A WATT		
SUCCESSORS TO EMMA J OSBORN	32.66	
SUCCESSORS IN PART TO ISABELA J GRANZ ESTATE	13.55	
SUCCESSORS IN PART TO GEORGE R MURDOCK	13.75	
SOLD TO CITY OF TORRANCE	-59.96	
TOTAL		0.00
BAUMAN, GUS A	0.00	0.00
TRANSFERRED TO PALOS VERDES BEGONIA FARM		
BEGO CORPORATION	4.10	
SOLD TO ESTATE OF GOLDA DELANEY	-4.10	
TOTAL		0.00
BELVIDERE MUTUAL WATER CO	33.40	
SOLD TO CITY OF TORRANCE	-33.40	
TOTAL		0.00
BLACK, DANA		
SUCCESSOR IN PART TO ESTATE OF JOHN GRANT	11.80	
SOLD TO ECOGAS, INC.	-11.80	
TOTAL		0.00
BOISE CASCADE BUILDING CO		
SUCCESSOR IN PART TO JOUGHIN TORRANCE RANCH	16.92	
SOLD TO INGLEWOOD, CITY OF	-16.92	
TOTAL		0.00
BOARD OF RETIREMENT-LOS ANGELES CO EMPL RET SYS		
SECOND WEST COAST BASIN JUDGMENT		
(NOW KNOWN AS LOS ANGELES COUNTY WESTERN AVE GOLF)		
BRANDSMA, MAYNARD		
SUCCESSOR IN PART TO ESTATE OF JOHN GRANT	11.80	
SOLD TO HILLSIDE MEMORIAL PARK	-11.80	
TOTAL		0.00
BURKE, W F AND LOIS PRICE	9.50	
SOLD TO H S SCOTT	-9.50	
TOTAL		0.00
CBS INC		
FORMERLY COLUMBIA BROADCASTING SYS INC	18.50	
SOLD TO MORAN, RONALD E	-9.00	
TOTAL		9.50
CALIFORNIA, STATE OF		
SUCCESSOR TO ROBERT L FULLILOVE	1.00	
SUCCESSOR TO JOE MONIZ JR	2.20	
SUCCESSOR IN PART TO KELLY PIPE CO	16.30	
SUCCESSOR IN PART TO FLAVIO RODRIGUEZ	4.00	
SUCCESSOR IN PART TO A H SMITH (SAM SURBER AND FREDA SMITH)	2.60	
SOLD TO SPARKLETTS DRINKING WATER CORP	-26.10	
TOTAL		0.00
CALIFORNIA WATER SERVICE CO	3,071.00	
SUCCESSOR TO PALOS VERDES WATER CO	999.00	
TOTAL		4,070.00
CALIFORNIA WATER SERVICE CO (DOMINGUEZ)		
DOMINGUEZ WATER CO MERGED WITH AND INTO CALIFORNIA WATER SERVICE CO, WATERMASTER ACCOUNT KNOWN AS CALIFORNIA WATER SERVICE CO (DOMINGUEZ)	10,162.45	
SUCCESSOR IN PART TO HONEYWELL INTERNATIONAL INC	255.00	
TOTAL		10,417.45
CARSON ESTATE CO	130.00	
SOLD TO DOMINGUEZ WATER CORP	-130.00	
TOTAL		0.00
CARSON-HARBOR VILLAGE MOBILE HOME PARK		
SUCCESSOR TO ETCHEMENDY, CAROLINE, ESTATE OF	8.20	
SOLD TO MONTROSE CHEMICAL CORPORATION OF CALIFORNIA (9-28-2011)	-1.20	
TOTAL		7.00
CARSON-MADRONA CO		
SUCCESSOR TO CHANSLOR-WESTERN OIL AND DEVELOP CO	104.00	104.00
CENTURY BUILDERS		
SUCCESSOR TO UNION NURSERY, INC	4.70	4.70
CHANDLERS PALOS VERDES SAND AND GRAVEL CORP		
SECOND WEST COAST BASIN JUDGMENT	95.20	
SUCCESSOR TO SOUTHWESTERN PORTLAND CEMENT CO	15.00	
SUCCESSOR TO TORRANCE SAND AND GRAVEL CORP	184.00	
TOTAL		294.20
CHANSLOR-WESTERN OIL AND DEVELOPMENT CO	104.00	
(FORMERLY CHANSLOR-CANFIELD MIDWAY OIL CO)		
SOLD TO CARSON-MADRONA CO	-104.00	
TOTAL		0.00
CHEMICALS CO OF ALLIED CORP		
(FORMERLY INDUSTRIAL CHEMICAL DIVISION, ALLIED CHEMICAL CORP)		

CHEVRON USA INC	4,541.70	
(FORMERLY STANDARD OIL CO OF CALIFORNIA)		
SUBJECT TO LONG TERM LEASE FROM ISABELLA GRANZ PER JUDGEMENT	59.60	
TOTAL		4,601.30
CHRISTIE, CLEM, DON C FOHL AND LEON LARSON	0.02	
(TRUSTEES OF WILMINGTON CEMETERY ASSOC)		
ABANDONED WATER RIGHT	-0.02	
TOTAL		0.00
CHURCHILL DOWNS CALIFORNIA CO		
SUCCESSOR TO HOLLYWOOD PARK OPERATING CO	282.00	
SOLD TO HOLLYWOOD PARK LAND COMPANY, LLC	-282.00	
TOTAL		0.00
CLUFF, BEN DAIRY		
SUCCESSOR TO EDWARD AND EMILY COST	7.40	
SOLD TO AMERICAN PLANT GROWERS, INC	-7.40	
TOTAL		0.00
COAST FOREST PRODUCTS		
SUCCESSOR TO SOUTHWEST STEEL ROLLING MILLS	3.40	
SOLD TO GEORGIA-PACIFIC CORP	-3.40	
TOTAL		0.00
COASTLINE CHURCH OF CHRIST		
SUCCESSOR TO LERMENS, EVELYN	0.70	0.70
COLLISTER, CAMERON		
SUCCESSOR TO JOUGHIN TORRANCE RANCH	136.82	
QUITCLAIMED TO NORMANDIE PARK	-136.82	
TOTAL		0.00
COLUMBIA BROADCASTING SYSTEM, INC		
(NOW KNOWN AS CBS INC)		
CONOCOPHILLIPS COMPANY		
SUCCESSOR TO TOSCO CORPORATION		
(NOW KNOWN AS PHILLIPS 66 COMPANY)		
COST, EDWARD AND EMILY	7.40	
SOLD TO BEN CLUFF DAIRY	-7.40	
TOTAL		0.00
CURTIS, OWEN W	3.80	
SOLD TO SOUTHERN CALIFORNIA WATER CO	-3.44	
TOTAL		0.36
DEL AMO ESTATE CO	121.00	
SOLD TO DOMINGUEZ WATER CORP	-121.00	
TOTAL		0.00
DELANEY, GOLDA, ESTATE OF		
(FORMERLY ARTHUR J DELANEY)		
SUCCESSOR TO BEGO CORP	4.10	4.10
DENNIS, ESTHER M SHEETS		
(FORMERLY ESTHER M SHEETS)	5.50	
SOLD TO TORRANCE, CITY OF	-5.50	
TOTAL		0.00
DESSER ENTERPRISES, INC.		
SECOND WEST COAST BASIN JUDGMENT	0.00	0.00
SOLD TO MYRON Z. CHLAVIN AND NETTIE DESSER TRUST AND JHD PROPERTIES, LLC	-0.00	0.00
DOMINGUEZ ESTATE CO	254.00	
SOLD TO DOMINGUEZ WATER CORP	-254.00	
TOTAL		0.00
DOMINGUEZ WATER CORP		
(NOW KNOWN AS DOMINGUEZ WATER CO)		
DOMINGUEZ WATER CO	9,477.80	
(FORMERLY KNOWN AS DOMINGUEZ WATER CORP)		
SUCCESSOR TO CARSON ESTATE CO	130.00	
SUCCESSOR TO DEL AMO ESTATE CO	121.00	
SUCCESSOR TO DOMINGUEZ ESTATE CO	254.00	
SUCCESSOR TO DON WILSON BUILDERS	32.60	
SUCCESSOR TO HEYDENBECK, JEANETTE R	0.70	
SUCCESSOR TO NAKANO, KIKUNO, ET AL	19.30	
SUCCESSOR IN PART TO H J EARLY	91.00	
SUCCESSOR IN PART TO R A WATT, INC	61.85	
SOLD IN PART TO WATSON LAND CO	-37.60	
SUCCESSOR TO THORPE, GREGORY	11.80	
DOMINGUEZ WATER CO MERGED WITH AND INTO CALIFORNIA WATER SERVICE CO, WATERMASTER ACCOUNT KNOWN AS CALIFORNIA WATER SERVICE CO (DOMINGUEZ)	-10,162.46	
TOTAL		0.00
DON WILSON BUILDERS		
SUCCESSORS TO KASUO, ISAMU, AND YOSHIKI R KITA	32.60	
SOLD TO DOMINGUEZ WATER CORP	-32.60	
TOTAL		0.00
DOUGLAS AIRCRAFT CO, INC		
(SEE MCDONNELL DOUGLAS CORP)		
EARLY, H J AND DAISY	111.00	
SOLD TO DOMINGUEZ WATER CORP	-91.00	
SOLD TO SAMUEL R AND RAYMOND S FUJIMOTO	-20.00	
TOTAL		0.00
ECOGAS, INC.		
SUCCESSOR TO BLACK, DANA	11.80	
SOLD TO AQUA CAPITAL MANAGEMENT LP	-11.80	

TOTAL		0.00
EDISON SECURITIES CO		
(NOW KNOWN AS ASSOCIATED SOUTHERN INVESTMENT CO)		
EL SEGUNDO, CITY OF	953.00	953.00
ENGELSMA, JAKE		
SUCCESSOR TO WILBUR HORNSTRA	14.10	
SOLD TO ASAHI FANCY KOI, INC	-2.00	
TRANSFERRED TO SUSAN ENGELSMA, TRUSTEE ET AL	-12.10	
TOTAL		0.00
ENGELSMA, SUSAN; TRUSTEE OF THE SUSAN ENGELSMA TRUST		
TRANSFERRED FROM JAKE ENGLESMA	12.10	12.10
EQUILON ENTERPRISES, LLC		
SUCCESSOR TO TEXACO REFINING AND MARKETING, INC	3,432.00	
SOLD TO SHELL OIL PRODUCTS US	-3,432.00	
TOTAL		0.00
ETCHEMENDY, CAROLINE, ESTATE OF	8.20	
SOLD TO CARSON-HARBOR VILLAGE MOBILE HOME PARK	-8.20	
TOTAL		0.00
EVERGREEN AMERICA CORP		
SUCCESSOR TO POTHOS CORP	5.40	5.40
EWING, CARMELITA ROSECRANS	91.30	
SOLD TO SOUTHERN CALIFORNIA WATER CO	-91.30	
TOTAL		0.00
EWING, NED ET AL		
SUCCESSOR IN PART TO ISABEL J GRANZ ESTATE	6.50	
SOLD TO R A WATT, INC	-6.50	
TOTAL		0.00
FLESH, LESLIE R AND ANDOR PASTERNAK, ET AL		
SUCCESSORS TO ALFRED D AND RUTH SEABACK	3.50	
SOLD TO STANLEY C LAGERLOF	-3.50	
TOTAL		0.00
FLETCHER OIL AND REFINING CO		
(FORMERLY FLETCHER OIL CO)	86.30	
SUCCESSOR TO FLETCHER, ROBERT G ET AL	3.70	
SOLD TO WESTERN WATER CO	-90.00	
TOTAL		0.00
FLETCHER, ROBERT G, DANIEL S, AND WILFRED O		
SUCCESSOR TO FRED A JUNGQUIST	3.70	
SOLD TO FLETCHER OIL AND REFINING CO	-3.70	
TOTAL		0.00
FUJIMOTO, SAMUEL R		
(FORMERLY KNOWN AS FUJIMOTO, SAMUEL R AND RAYMOND S)		
SUCCESSOR IN PART TO H J AND DAISY EARLY	20.00	
SOLD TO FUJIMOTO, SAMUEL R, STEVEN T AND JON T JOINT TENANTS	-20.00	
TOTAL		0.00
FUJIMOTO, SAMUEL R AND RAYMOND S		
(SEE FUJIMOTO, SAMUEL R)		
FUJIMOTO, SAMUEL R, STEVEN T AND JON K, JOINT TENANTS		
SUCESSOR TO FUJIMOTO, SAMUEL R	20.00	20.00
FULLILOVE, ROBERT L	1.00	
SOLD TO STATE OF CALIFORNIA	-1.00	
TOTAL		0.00
FUTURA INDUSTRIES, INC		
SUCCESSOR TO SPANISH AMERICAN INSTITUTE	44.40	
SOLD TO KAUFMAN, LEO AND SHELDON BAER	-44.40	
TOTAL		0.00
GARRETT CORP, THE		
SUCCESSOR TO SHINODA BROTHERS INC	22.50	
TRANSFERRED TO ALLIED-SIGNAL INC (TORRANCE OFFICE)	-22.50	
TOTAL		0.00
GATX TANK STORAGE TERMINALS CORP		
SUCCESSOR TO PHILLIPS PETROLEUM CO	167.00	
SOLD TO KINDER MORGAN LIQUIDS TERMINALS, LLC.	-167.00	
TOTAL		0.00
GEORGIA-PACIFIC CORP		
SUCCESSOR TO COAST FOREST PRODUCTS	3.40	
SOLD TO INGLEWOOD, CITY OF	-3.40	
TOTAL		0.00
GERAHUE LAND CO		
SUCCESSOR AND ASSIGNEE FOR A S JOHNSTON DRILL CO	11.90	
ABANDONED WATER RIGHT	-11.90	
TOTAL		0.00
GILLINGHAM, FLORENCE R, ET AL	2.40	2.40
GOLDEN STATE WATER COMPANY		
SUCCESSOR TO SOUTHERN CALIFORNIA WATER COMPANY (NAME CHANGE)	7,502.24	7,502.24
GONZALES, FELIPE AND GABRIELA		
(NOW KNOWN AS GONZALES, GABRIELA AND MARIA R)		

GONZALES, GABRIELA AND MARIA R		
(FORMERLY GONZALES, FELIPE AND GABRIELA)	34.30	
SOLD TO TORRANCE, CITY OF	-34.30	
TOTAL		0.00
GRAND LAND CO		
SUCCESSOR IN PART TO SMITH, A H, ET AL	5.70	
ABANDONED WATER RIGHTS 1961-62	-5.70	
TOTAL		0.00
GRANT, JOHN, ESTATE OF	59.00	
APPORTIONED IN PART TO BLACK, DANA	-11.80	
APPORTIONED IN PART TO BRANDSMA, MAYNARD	-11.80	
APPORTIONED IN PART TO HONOLD, KRISTIN BRANDSMA	-11.80	
APPORTIONED IN PART TO THORPE, GREGORY	-11.80	
APPORTIONED IN PART TO THORPE, TERRENCE	-11.80	
TOTAL		0.00
GRANZ, ISABELA J	380.00	
PARTITIONED TO HEIRS:		
ISABELA J GRANZ ESTATE	-33.80	
JOUGHIN TORRANCE RANCH	-212.42	
GEORGE R MURDOCK	-15.12	
EMMA J OSBORN	-32.66	
SUBJECT TO LONG TERM LEASE TO: STANDARD OIL CO OF CALIF	-59.60	
SUPERIOR OIL CO	-26.40	
TOTAL		0.00
GRANZ, ISABELA J, ESTATE OF		
SUCCESSOR IN PART TO ISABELA J GRANZ	33.80	
SOLD IN PART TO RICHARD BARCLAY AND R A WATT	-13.55	
SOLD IN PART TO NED EWING, ET AL	-6.50	
SOLD IN PART TO R A WATT, INC	-13.75	
TOTAL		0.00
HARRIS, R AND L		
SUCCESSOR TO LAWRENCE I LISTON	0.70	
DISCLAIMED WATER RIGHT	-0.70	
TOTAL		0.00
HARRIS TUBE, INC		
SUCCESSOR IN PART TO B ROBINSON AND ASSOCIATES	0.70	
TRANSFERRED TO AUTOMATION IND INC-HARRIS TUBE	-0.70	
TOTAL		0.00
HAWTHORNE, CITY OF	1,882.00	1,882.00
HENDERSON, BEATRICE M	1.30	
ABANDONED WATER RIGHT	-1.30	
TOTAL		0.00
HEYDENBECK, JEANETTE R		
(FORMERLY JEANETTE R REIFSNYDER)	0.70	
SOLD TO DOMINGUEZ WATER CORP	-0.70	
TOTAL		0.00
HILLSIDE MEMORIAL PARK	16.70	
SUCCESSOR TO SANTA FE LAND IMPROVEMENT CO	39.50	
SUCCESSOR TO SIGMUND S AND LIONEL S HOCKWALD	12.50	
SUCCESSOR TO THORPE, TERRENCE	11.80	
SUCCESSOR TO BRANDSMA, MAYNARD	11.80	
TOTAL		92.30
HOCKWALD, SIGMUND S AND LIONEL S	12.50	
SOLD TO HILLSIDE MEMORIAL PARK	-12.50	
TOTAL		0.00
HOLLYWOOD PARK INC		
(FORMERLY HOLLYWOOD TURF CLUB)		
(NOW KNOWN AS HOLLYWOOD PARK OPERATING CO)		
HOLLYWOOD PARK LAND COMPANY,LLC		
SUCCESSOR TO CHURCHILL DOWNS CALIFORNIA COMPANY	282.00	282.00
HOLLYWOOD PARK OPERATING CO		
(FORMERLY HOLLYWOOD PARK INC)	282.00	
SOLD TO CHURCHILL DOWNS CALIFORNIA CO	-282.00	
TOTAL		0.00
HOLLYWOOD TURF CLUB		
(NOW KNOWN AS HOLLYWOOD PARK INC)		
HONEYWELL INTERNATIONAL INC		
MERGED WITH ALLIED-SIGNAL INC (EL SEGUNDO AND TORRANCE OFFICES) AND THE CORP NAME CHANGED TO HONEYWELL INTERNATIONAL INC	277.50	
SOLD IN PART TO CALIFORNIA WATER SERVICE CO (DOMINGUEZ)	-255.00	
TOTAL		22.50
HONOLD, KRISTIN BRANDSMA		
SUCCESSOR IN PART TO ESTATE OF JOHN GRANT	11.80	11.80
HORNSTRA, WILBUR	14.10	
SOLD TO JAKE ENGELSMA	-14.10	
TOTAL		0.00
HUGHES AIRCRAFT	0.00	0.00
(SEE 1981 JUDGMENT ORDER)		
HUNT, DONALD G		
SUCCESSOR TO JAMES SCANDA	1.90	
SOLD TO KENICHI INOSE	-1.90	
TOTAL		0.00
INDUSTRIAL CHEMICAL DIVISION, ALLIED CHEMICAL CORP		
(FORMERLY ALLIED CHEMICAL CORP, GEN CHEMICAL CO)		
(NOW KNOWN AS ALLIED CORP)		
INGLEWOOD, CITY OF	4,382.00	
SUCCESSOR TO ABELL, FRANK	1.80	
SUCCESSOR TO BOISE CASCADE BUILDING CO	16.92	
SUCCESSOR TO GEORGIA-PACIFIC CORP	3.40	
SUCCESSOR TO KAUFMAN, LEO AND SHELDON BAER	44.40	
SUCCESSOR IN PART TO GEORGE R MURDOCK	1.37	
TOTAL		4,449.89
INOSE ET AL		
(KEN K INOSE, KAY K INOSE, KIYOKO YOSHIYAMA, KENICHI INOSE, KAYOKO K INOSE AND DAVID T NAKATANI, TRUSTEE OF THE INOSE CHILDREN TRUST U/D/T DATE 11/1/78)		
(FORMERLY INOSE, KENICHI)		
SUCCESSOR TO HUNT, DONALD G	1.90	
SUCCESSOR TO THAXTER, RALPH AND LOIS A LENOIR	3.50	
SOLD TO POTHOS CORP	-5.40	
TOTAL		0.00
INOSE, KENICHI		
(NOW KNOWN AS INOSE ET AL)		
JENKINS, HARRY C		
SUCCESSOR TO H L PERRY	1.80	
SOLD TO ABC NURSERY, INC	-1.80	
TOTAL		0.00
JOHNS-MANVILLE PRODUCTS CORP		
(SEE JOHNS-MANVILLE SALES CORP)		
JOHNS-MANVILLE SALES CORP		
(FORMERLY: JOHNS-MANVILLE PRODUCTS CORP MANVILLE SERVICE CORP)		
(NOW KNOWN AS MANVILLE SALES CORP)		
TOTAL		0.00
JOHNSTON, A S, DRILLING CO	11.90	
ASSIGNED TO GERAHUE LAND CO	-11.90	
TOTAL		0.00
JONES, ANNA MAE	50.20	
SOLD TO CITY OF TORRANCE	-50.20	
TOTAL		0.00
JOUGHIN TORRANCE RANCH		
SUCCESSOR IN PART TO ISABELA J GRANZ	212.42	
SOLD IN PART TO BARCLAY HOLLANDER CURCI INC	-3.33	
SOLD IN PART TO BOISE CASCADE BUILDING CO	-16.92	
SOLD IN PART TO COLLISTER, CAMERON	-136.82	
SOLD IN PART TO R A WATT, INC	-55.35	
TOTAL		0.00
JUNGQUIST, FRED A		
(FORMERLY KATHERINE P WOODMAN)	3.70	
SOLD TO ROBERT G FLETCHER ET AL	-3.70	
TOTAL		0.00
KAHLERT, ET AL		
AND SUCCESSOR IN PART TO KELLY PIPE CO	18.90	
SOLD TO SPARKLETTS DRINKING WATER CORP	-18.90	
TOTAL		0.00
KAUFMAN, LEO AND SHELDON BAER		
SUCCESSOR TO FUTURA INDUSTRIES INC	44.40	
SOLD TO CITY OF INGLEWOOD	-44.40	
TOTAL		0.00
KELLY PIPE CO	49.00	
SOLD IN PART TO STATE OF CALIFORNIA	-16.30	
SOLD IN PART TO KAHLERT, ET AL	-18.90	
SOLD IN PART TO SPARKLETTS DRINKING WATER CORP	-13.80	
TOTAL		0.00
KINDER MORGAN LIQUIDS TERMINALS, LLC.		
SUCCESSOR TO GATX TANK STORAGE TERMINALS CORP.	167.00	167.00
KITA, ISAMU, KASUO, AND YOSHIKI R	32.60	
SOLD TO DON WILSON BUILDERS	-32.60	
TOTAL		0.00
KURTZ, GLADYS	3.50	
SOLD TO SPARKLETTS DRINKING WATER CORP	-3.50	
TOTAL		0.00
LAGERLOF, STANLEY C		
SUCCESSOR TO LESLIE R FLESCH AND ANDOR PASTERNAK, ET AL	3.50	
SOLD TO SHELL OIL CO	-3.50	
TOTAL		0.00

LAWLER, JAMES K	3.10	
SOLD TO B ROBINSON AND ASSOC	-3.10	
TOTAL		0.00
LERMENS, EVELYN		
(FORMERLY LERMENS, ALFRED)	0.70	
SOLD TO COASTLINE CHURCH OF CHRIST	-0.70	
TOTAL		0.00
LEUZINGER, EMMA L	1.40	1.40
LISTON, LAWRENCE	0.70	
SOLD TO R AND L HARRIS	-0.70	
TOTAL		0.00
LITTLE, WILLIAM		
SUCCESSOR TO ROCKWELL, MICHAEL	0.10	
SOLD TO WATT INDUSTRIAL PROPERTIES	-0.10	
TOTAL		0.00
LOMITA, CITY OF WATER SYSTEM (WWD 13)	1,352.00	1,352.00
(FORMERLY LOS ANGELES COUNTY WATERWORKS DISTRICT NO 13)		
LONG BEACH, CITY OF	0.70	0.70
LOPES, FRANK	3.70	3.70
LOS ANGELES, CITY OF	1,503.00	1,503.00
LOS ANGELES COUNTY-ALONDRA PARK	28.70	
SUCCESSOR TO LOS ANGELES COUNTY FLOOD CONTROL DIST	39.00	
MERGED WITH LOS ANGELES COUNTY CHESTER L. WASHINGTON GOLF COURSE UNDER NEW NAME "LOS ANGELES COUNTY RECREATION FACILITIES"	-67.70	
TOTAL		0.00
LOS ANGELES COUNTY CHESTER L WASHINGTON GOLF COURSE		
(FORMERLY LOS ANGELES COUNTY WESTERN AVENUE GOLF COURSE)	*296.00*	
MERGED WITH LOS ANGELES COUNTY ALONDRA PARK UNDER NEW NAME "LOS ANGELES COUNTY RECREATION FACILITIES"	-296.00	
TOTAL		0.00
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT	37.60	
SUCCESSOR IN PART TO A H SMITH, ET AL	1.40	
SOLD TO LOS ANGELES COUNTY - ALONDRA PARK	-39.00	
TOTAL		0.00
LOS ANGELES COUNTY RECREATION FACILITIES		
MERGER OF LOS ANGELES COUNTY ALONDRA PARK, AND	67.70	
LOS ANGELES COUNTY CHESTER L. WASHINGTON GOLF COURSE	296.00	
TOTAL		363.70
LOS ANGELES COUNTY SANITATION DIST NO 2	102.00	102.00
LOS ANGELES COUNTY WATERWORKS DISTRICT NO 13		
(NOW KNOWN AS LOMITA, CITY OF WATER SYSTEM WWD 13)		
LOS ANGELES COUNTY WATERWORKS DISTRICT NO 22	551.00	
SOLD TO SOUTHERN CALIF WATER CO	-551.00	
TOTAL		0.00
LOS ANGELES COUNTY WESTERN AVE GOLF COURSE		
(FORMERLY BOARD OF RETIREMENT OF THE LOS ANGELES COUNTY EMPLOYEES RETIREMENT SYSTEM)		
(NOW KNOWN AS LOS ANGELES CHESTER L WASH GOLF)		
LOYOLA MARYMOUNT UNIVERSITY		
(FORMERLY LOYOLA UNIVERSITY OF LOS ANGELES)	48.10	48.10
MANHATTAN BEACH, CITY OF	1,131.20	1,131.20
MANVILLE SALES CORP	881.00	
(FORMERLY: JOHNS-MANVILLE SALES CORP JOHNS-MANVILLE PRODUCTS CORP MANVILLE SERVICE)		
SOLD TO ATLANTIC RICHFIELD CO	-881.00	
TOTAL		0.00
MANVILLE SERVICE CORP		
(SEE JOHNS-MANVILLE SALES CORP)		
MARTIN BROTHERS BOX CO, INC	3.40	
SOLD TO SOUTHWEST STEEL ROLLING MILLS	-3.40	
TOTAL		0.00
MAYFLOWER NURSERIES	0.00	0.00
(HERBERT SAKAYE FUKUWAI, DBA)		
MCCANDLESS, JAMES	6.70	
SOLD TO SPARKLETTS DRINKING WATER CORP	-6.70	
TOTAL		0.00
MCDONNELL DOUGLAS CORP		
(FORMERLY DOUGLAS AIRCRAFT, CO INC)		
LONG TERM LEASE FROM UNITED STATES NAVY DEPARTMENT	1.70	1.70
MOBIL OIL CORP		
(FORMERLY SOCONY MOBIL OIL CO)	2,570.00	
SUCCESSOR TO SUPERIOR OIL CO	26.40	
TOTAL		2,596.40
MONETA MUTUAL WATER CO	916.00	
SOLD TO CITY OF TORRANCE	-916.00	
TOTAL		0.00
MONIZ, JOE JR	2.20	
SOLD TO STATE OF CALIFORNIA	-2.20	
TOTAL		0.00
MONTROSE CHEMICAL CORPORATION OF CALIFORNIA		
SUCCESSOR TO CARSON-HARBOR VILLAGE MOBILE HOME PARK (9-28-2011)	1.20	1.20
MORAN, RONALD E		
SUCCESSOR IN PART TO COLUMBIA BROADCASTING SYSTEM, INC	9.00	
SOLD TO CITY OF TORRANCE	-9.00	
TOTAL		0.00
MORI, ROY H AND KENJI		
SECOND WEST COAST BASIN JUDGMENT	5.60	
SOLD TO NOZAKI, SUMIKICHI	-2.00	
TOTAL		3.60
MURDOCK, GEORGE R		
SUCCESSOR IN PART TO ISABELA J GRANZ	15.12	
SOLD IN PART TO R BARCLAY AND R A WATT	-13.75	
SOLD IN PART TO CITY OF INGLEWOOD	-1.37	
TOTAL		0.00
MYRON Z. CHLAVIN AND NETTIE DESSER TRUST AND JHD PROPERTIES, LLC		
SUCCESSOR TO DESSER ENTERPRISES, INC.	0.00	0.00
NAKANO, KIKUNO, ET AL	19.30	
SOLD TO DOMINGUEZ WATER CORP	-19.30	
TOTAL		0.00
NAVARRO, T C	53.90	
SOLD TO HILARIO S AND EMMA ALWAG	-53.90	
TOTAL		0.00
NORAIR, A DIVISION OF NORTHROP CORP		
(FORMERLY KNOWN AS NORTHROP AIRCRAFT, INC)		
(NOW KNOWN AS NORTHROP CORP)		
NORMANDIE PARK		
SUCCESSOR TO COLLISTER, CAMERON	136.82	
SOLD TO CITY OF TORRANCE	-136.82	
TOTAL		0.00
NORTHROP CORP		
(FORMERLY KNOWN AS NORAIR, A DIV OF NORTHROP CORP)	38.15	38.15
NOZAKI, SUMIKICHI		
SUCCESSOR IN PART TO MORI, ROY H AND KENJI	2.00	
SUCCESSOR IN PART TO UNITED CALIFORNIA BANK	5.00	
TOTAL		7.00
OSBORN, EMMA J		
SUCCESSOR IN PART TO ISABELA J GRANZ	32.66	
SOLD TO R BARCLAY AND R A WATT	-32.66	
TOTAL		0.00
OTANI, CHISATO	0.00	0.00
PACIFIC CREST CEMETERY CO	17.70	
SUCCESSOR TO H S SCOTT	9.50	
SUCCESSOR TO WADA, KAORU AND SATORU	12.20	
TOTAL		39.40
PALOS VERDES BEGONIA FARM		
SUCCESSOR TO GUS A BAUMAN	0.00	0.00
PALOS VERDES WATER CO	999.00	
SOLD TO CALIFORNIA WATER SERVICE CO	-999.00	
TOTAL		0.00
PARK WATER CO	160.00	
SOLD TO SOUTHERN CALIFORNIA WATER	-160.00	
TOTAL		0.00
PARKE, ZORAIDA	1.80	
SOLD TO H L PERRY	-1.80	
TOTAL		0.00
PASCHKE, WILLIAM JOSEPH	0.02	
ABANDONED WATER RIGHT	-0.02	
TOTAL		0.00
PERRY, H L		
SUCCESSOR TO ZORAIDA PARKE	1.80	
SOLD TO HARRY C JENKINS	-1.80	
TOTAL		0.00
PHILLIPS 66 COMPANY		
(FORMERLY CONOCOPHILLIPS COMPANY)	6,170.00	
PHILLIPS PETROLEUM CO		
(FORMERLY TIDEWATER OIL CO)	167.00	
SOLD TO GATX TANK STORAGE TERM CORP	-167.00	
TOTAL		6,170.00
POTHOS CORP		
SUCCESSOR TO INOSE ET AL	5.40	
SOLD TO EVERGREEN AMERICA CORP	-5.40	
TOTAL		0.00
REHOR, JOSEPHINE P	2.20	2.20
REIFSNYDER, JEANETTE R		
(NOW KNOWN AS JEANNETTE R HEYDENBECK)		
RHODIA, INC		
(NOW KNOWN AS SOLVAY USA INC.)		
SUCCESSOR TO RHONE-POULENC INC		
RHONE-POULENC BASIC CHEMICALS CO		
SUCCESSOR TO STAUFFER CHEMICAL CO	521.00	

SOLD TO RHONE-POULENE INC	-521.00	
TOTAL		0.00
RHONE-POULENC INC		
SUCCESSOR TO RHONE-POULENC, BASIC CHEMICALS CO	521.00	
SOLD TO RHODIA, INC	-521.00	
TOTAL		0.00
RICHFIELD OIL CORP		
(NOW KNOWN AS ATLANTIC RICHFIELD CO)		
ROBINSON, B, AND ASSOCIATES		
SUCCESSOR TO JAMES K LAWLER	3.10	
SOLD IN PART TO HARRIS TUBE, INC	-0.70	
SOLD IN PART TO SOUTHERN CALIFORNIA WATER CO	-2.40	
TOTAL		0.00
ROCKWELL, MICHAEL L		
SUCCESSOR TO BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIATION (TRUST B 1-51)	0.10	
SOLD TO LITTLE, WILLIAM	-0.10	
TOTAL		0.00
RODRIGUEZ, FLAVIO	6.10	
SOLD TO STATE OF CALIFORNIA	-4.00	
DISCLAIMED WATER RIGHT	-2.10	
TOTAL		0.00
ROMAN CATHOLIC ARCHBISHOP OF LOS ANGELES (HOLY CROSS CEMETERY)	72.30	72.30
RUFFNER CORP		
SUCCESSOR TO LOUIS M SEPULVEDA	0.70	
ABANDONED WATER RIGHT	-0.70	
TOTAL		0.00
RYAN AERONAUTICAL CO	20.20	
SOLD TO SOUTHERN CALIFORNIA WATER CO	-20.20	
TOTAL		0.00
SANTA FE LAND IMPROVEMENT CO	39.50	
SOLD TO HILLSIDE MEMORIAL PARK	-39.50	
TOTAL		0.00
SCANDA, JAMES AND GEORGE NASSIN	1.90	
SOLD TO DONALD G HUNT	-1.90	
TOTAL		0.00
SCHLAEGEL, KEITH W AND OPAL B	13.60	
SOLD TO SIDNEY R AND CHARLOTTE W TITLE	-13.60	
TOTAL		0.00
SCOTT, H S		
SUCCESSOR TO W F BURKE AND LOIS PRICE	9.50	
QUITCLAIMED TO PACIFIC CREST CEMETERY CO	-9.50	
TOTAL		0.00
SEABACK, ALFRED D AND RUTH	3.50	
SOLD TO LESLIE R FLESH AND OR PASTERNAK, ET AL	-3.50	
TOTAL		0.00
SEPULVEDA, LOUIS M	0.70	
ACQUIRED BY RUFFNER CORP	-0.70	
TOTAL		0.00
SHEETS, ESTHER M		
(FORMERLY CLYDE L SHEETS)		
(SEE DENNIS, ESTHER M SHEETS)		
SHELL OIL CO	4,516.00	
SUCCESSOR TO LAGERLOF, STANLEY C	3.50	
SOLD IN PART TO UNION OIL CO OF CAL	-1,974.00	
SOLD IN PART TO UNION OIL CO OF CAL	-1,526.00	
TOTAL		1,019.50
SHELL OIL PRODUCTS US		
SUCCESSOR TO EQUILON ENTERPRISES, LLC	3,432.00	
SOLD TO TESORO REFINING AND MARKETING COMPANY	-3,432.00	
TOTAL		0.00
SHINODA BROTHERS, INC		
SECOND WEST COAST BASIN JUDGMENT	22.50	
SOLD TO GARRETT CORP, THE	-22.50	
TOTAL		0.00
SMITH, A H,(SAM SURBER AND FREDA SMITH)	9.70	
SOLD IN PART TO STATE OF CALIFORNIA	-2.60	
SOLD IN PART TO GRAND LAND CO	-5.70	
SOLD IN PART TO L A CO FLOOD CONTROL DISTRICT	-1.40	
TOTAL		0.00
SOCONY MOBIL OIL CO		
(SEE MOBIL OIL CO)	10.40	
SOLVAY USA INC.		
(FORMERLY RHODIA, INC.)	521.00	
TOTAL		521.00
SOUTHERN CALIFORNIA EDISON CO		
SUCCESSOR TO ASSOCIATED SOUTHERN INVESTMENT CO	46.70	
TOTAL		57.10
SOUTHERN CALIFORNIA WATER CO	6,265.30	
SUCCESSOR TO EWING, CARMELITA	91.30	

ROSECRANS		
SUCCESSOR TO LOS ANGELES COUNTY WATERWORKS DIST NO 22	551.00	
SUCCESSOR TO PARK WATER CO	160.00	
SUCCESSOR TO RYAN AERONAUTICAL CO	20.20	
SUCCESSOR TO SOUTHERN PACIFIC CO	166.00	
SUCCESSOR IN PART TO OWEN W CURTIS	3.44	
SUCCESSOR IN PART TO B ROBINSON AND ASSOCIATES	2.40	
SUCCESSOR TO WESTERN WATER SERVICE COMPANY	242.60	
NAME CHANGE TO GOLDEN STATE WATER COMPANY	-7,502.24	
TOTAL		0.00
SOUTHERN PACIFIC CO	166.00	
SOLD TO SO CALIFORNIA WATER CO	-166.00	
TOTAL		0.00
SOUTHERN WESTERN PORTLAND CEMENT COMPANY	15.00	
SOLD TO CHANDLERS PALOS VERDES AND GRAVEL CORP	-15.00	
TOTAL		0.0
SOUTHWEST STEEL ROLLING MILLS		
SUCCESSOR TO MARTIN BROTHERS BOX CO, INC	3.40	
SOLD TO COAST FOREST PRODUCTS	-3.40	
TOTAL		0.00
SPANISH AMERICAN INSTITUTE	44.40	
SOLD TO FUTURA INDUSTRIES, INC	-44.40	
TOTAL		0.00
SPARKLETTS DRINKING WATER CORP		
SUCCESSOR TO ANDERSON, REMBERT C, ET AL	80.60	
SUCCESSOR TO CALIFORNIA, STATE OF	26.10	
SUCCESSOR TO KAHLERT, ET AL	18.90	
SUCCESSOR TO KURTZ, GLADYS	3.50	
SUCCESSOR TO MCCANDLESS, JAMES	6.70	
SUCCESSOR TO WECHSLER, B A	3.10	
SUCCESSOR IN PART TO KELLY PIPE CO	13.80	
SOLD TO WESTERN WATER CO	-152.60	
TOTAL		0.00
STANDARD OIL CO OF CALIFORNIA		
(NOW KNOWN AS CHEVRON U S A, INC)		
STAUFFER CHEMICAL CO	521.00	
SOLD TO RHONE-POULENC BASIC CHEMICALS CO	-521.00	
TOTAL		0.00
SUNRISE GROWERS, INC		
SUCCESSOR TO AMERICAN PLANT GROWERS INC	10.00	
SOLD TO AMERICAN PLANT GROWERS, INC	-10.00	
TOTAL		0.00
SUPERIOR OIL CO		
SUBJECT TO LONG TERM LEASE FROM ISABELA J GRANZ	26.40	
SOLD TO MOBIL OIL CORP	-26.40	
TOTAL		0.00
SWICK, PEGGY	5.60	
SOLD TO HILARIO AND EMMA ALWAG	-5.60	
TOTAL		0.00
TESORO REFINING AND MARKETING COMPANY		
SUCCESSOR TO SHELL OIL PRODUCTS US		
(NOW KNOWN AS TESORO REFINING & MARKETING COMPANY LLC)		
TESORO REFINING & MARKETING COMPANY LLC		
(FORMERLY TESORO REFINING AND MARKETING COMPANY)	3,432.00	
SUCCESSOR TO ATLANTIC RICHFIELD COMPANY (6-13-2013)	5,309.00	8,741.00
TEXACO, INC		
(NOW KNOWN AS TEXACO REFINING AND MARKETING, INC)		
TEXACO REFINING AND MARKETING, INC	3,432.00	
(FORMERLY: TEXACO, INC)		
SOLD TO EQUILON ENTERPRISES, LLC	-3,432.00	
TOTAL		0.00
THAXTER, RALPH AND LOIS A LENOIR	3.50	
SOLD TO KENICHI INOSE	-3.50	
TOTAL		0.00
THORPE, GREGORY		
SUCCESSOR IN PART TO ESTATE OF JOHN GRANT	11.80	
SOLD TO DOMINGUEZ WATER CORP	-11.80	
TOTAL		0.00
THORPE, TERRENCE		
SUCCESSOR IN PART TO ESTATE OF JOHN GRANT	11.80	
SOLD TO HILLSIDE MEMORIAL PARK	-11.80	
TOTAL		0.00
TIDEWATER OIL CO		
(SEE PHILLIPS PETROLEUM CO)		
TITLE, SIDNEY R AND CHARLOTTE W		
SUCCESSOR TO KEITH W AND OPAL B	13.60	

SCHLAEGE L		
SOLD TO ABC NURSERY, INC	-13.60	
TOTAL		0.00
TORRANCE, CITY OF	2,519.00	
SUCCESSOR TO BARCLAY HOLLANDER CORP	3.33	
SUCCESSOR TO BARCLAY, RICHARD AND WATT, R A	59.96	
SUCCESSOR TO BELVIDERE MUTUAL WATER CO	33.40	
SUCCESSOR TO DENNIS, ESTHER M SHEETS	5.50	
SUCCESSOR TO ALCAST FOUNDRY ET AL	7.20	
SUCCESSOR TO GONZALES, GABRIELA AND MARIA R	34.30	
SUCCESSOR TO JONES, ANNA MAE	50.20	
SUCCESSOR TO MONETA WATER CO	916.00	
SUCCESSOR TO MORAN, RONALD E	9.00	
SUCCESSOR TO NORMANDIE PARK	136.82	
SUCCESSOR TO TORRANCE UNIFIED SCHOOL DISTRICT	59.40	
SUCCESSOR TO UNITED STATES STEEL CORP	1,791.00	
SUCCESSOR TO WATT, R A, INC	13.75	
TOTAL		5,638.86
TORRANCE SAND AND GRAVEL CORP		
SUCCESSOR TO WESTON INVESTMENT CO	184.00	
SOLD TO CHANDLERS PALOS VERDES SAND AND GRAVEL CORP	-184.00	
TOTAL		0.00
TORRANCE UNIFIED SCHOOL DISTRICT		
SUCCESSOR TO HILARIO S AND EMMA ALWAG	59.40	
SOLD TO CITY OF TORRANCE	-59.40	
TOTAL		0.00
TOSCO CORP		
SUCCESSOR TO UNION OIL CO OF CALIF	6,170.00	
MERGED INTO CONOCOPHILLIS COMPANY	-6,170.00	
TOTAL		0.00
TUNE, MATES, ET AL		
SUCCESSOR TO JOSEPHINE WATKINSON	3.10	
SOLD TO B A WECHSLER	-3.10	
TOTAL		0.00
UNION NURSERY, INC		
SECOND WEST COAST BASIN JUDGMENT	*4.70*	
SOLD TO CENTURY BUILDERS	-4.70	
TOTAL		0.00
UNION OIL CO OF CALIFORNIA	**2,670.00**	
SUCCESSOR IN PART TO SHELL OIL CO	1,974.00	
SUCCESSOR IN PART TO SHELL OIL CO	1,526.00	
SOLD TO TOSCO CORP	-6,170.00	
TOTAL		0.00
UNITED CALIFORNIA BANK		
SUCCESSOR TO BALLMAN, ROSEMARY N	7.00	
SOLD TO A B C NURSERY, INC	-2.00	
SOLD TO NOZAKI, SUMIKICHI	-5.00	
TOTAL		0.00
UNITED STATES NAVY DEPARTMENT	**1.70**	
LONG TERM LEASE TO MCDONNELL DOUGLAS CORP PER JUDGEMENT	-1.70	
TOTAL		0.00
UNITED STATES STEEL CORP	**1,791.00**	
SOLD TO TORRANCE, CITY OF	-1,791.00	
TOTAL		0.00
VERBURG, WILLIAM AND CLARA B	**6.70**	
SOLD TO ABC NURSERY, INC	-6.70	
TOTAL		0.00
VUKELICH MIKE, JR.		
SUCCESSOR TO AMERICAN PLANT GROWERS, INC.	10.00	10.00
WADA, KAORU AND SATORU	**12.20**	
SOLD TO PACIFIC CREST CEMETERY CO	-12.20	
TOTAL		0.00
WATKINSON, JOSEPHINE	**3.10**	
SOLD TO MATES TUNE, ET AL	-3.10	
TOTAL		0.00
WATSON LAND CO	**42.60**	
SUCCESSOR IN PART TO DOMINGUEZ WATER CORP	37.60	
TOTAL		80.20
WATT INDUSTRIAL PROPERTIES		
SUCCESSOR TO WILLIAM LITTLE	0.10	0.10
WATT, R A, INC		
SUCCESSOR TO NED EWING, ET AL	6.50	
SUCCESSOR IN PART TO ISABELA J GRANZ ESTATE	13.75	
SUCCESSOR IN PART TO JOUGHIN TORRANCE RANCH	55.35	
SOLD TO DOMINGUEZ WATER CORP	-61.85	
SOLD TO CITY OF TORRANCE	-13.75	
TOTAL		0.00
WECHSLER, B A		
SUCCESSOR TO MATES TUNE, ET AL	3.10	
SOLD TO SPARKLETTS DRINKING WATER CORP	-3.10	
TOTAL		0.00
WESTERN WATER CO		
SUCCESSOR TO FLETCHER OIL AND REFINING CO	90.00	
SUCCESSOR TO SPARKLETTS DRINKING WATER CORP	152.60	
SOLD TO WESTERN WATER SERVICES CO	-242.60	
TOTAL		0.00
WESTERN WATER SERVICES CO *		
SUCCESSOR TO WESTERN WATER CO.	242.60	
SOLD TO SOUTHERN CALIFORNIA WATER COMPANY	-242.60	0.00
WESTON INVESTMENT CO	**184.00**	
SOLD TO TORRANCE SAND AND GRAVEL CORP	-184.00	
TOTAL		0.00
WISEBURN SCHOOL DISTRICT	8.20	8.20
WOODMAN, KATHERINE P		
(SEE FRED A JUNGQUIST)		
ZEIGLER, MAXWELL T	0.00	0.00
GRAND TOTAL	64,468.25	64,468.25

WEST COAST BASIN JUDGMENT-1961
SECOND WEST COAST BASIN JUDGMENT
CURRENT WATER RIGHT HOLDERS

* WESTERN WTR. SERV.CO. – PARTY WITH ZERO ADJUDICATED RIGHTS FOR THE DURATION OF LONG TERM LEASE AGREEMENT WITH CHEVRON (ENDED JUNE 30, 2013)

Attachment T

Summary BMP Performance Data

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This attachment includes tables summarizing the existing Best Management Practice (BMP) performance data obtained from the sources listed below, corresponding with Section 4.4 of the Dominguez Channel Watershed Management Group (DC WMG) Enhanced Watershed Management Program (EWMP):

- CASQA Development and Municipal BMP Handbooks
- California Department of Transportation (Caltrans) BMP Retrofit Pilot Program Report
- Center for Watershed Protection's National Pollutant Removal Performance Database Version 3
- Priority A and B Catch Basin Cleanout Data

The table associated with the CASQA Development and Municipal BMPs handbook provides a general summary of BMP performance within Southern California, while the tables associated with the other sources provides site specific performance data based on site specific testing. This information is provided for reference only.

Attachment T List of Tables

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Table T.1: Treatment Control BMP Removal Efficiency Per CASQA and BMP Handbooks

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

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Table T.2: Treatment Control BMP Pollutant Removal Efficiency

Pollutant of Concern	Caltrans BMP Retrofit Pilot Program Concentration Percent Reduction (%)													
	Austin Sand Filter	Delaware Sand Filter	Extended Detention Basin (Unlined)	Extended Detention Basin (Lined)	Wet Basin Storm (Wet Weather)	Wet Basin Base flow (Wet Weather)	Bioswale	Biofiltration Strip	Storm-Filter™	Multi-Chambered Treatment Train	Continuous Deflective Separators (CDS®)	StreamGuard™ Inlet Insert	FossilFilter™ Inlet Insert	Oil Water Separator
Total Suspended Solids	90	81	72	40	94	21	49	69	40	75	0	3	14	49
NO_3-N	-67	-142	8	8	77	49	27	-30	-7	-68	15	----	----	----
TKN	53	36	17	16	27	-11	31	-5	19	17	0	----	----	----
Total N[A]	32	9	14	14	51	43	30	-10	13	0	5	----	----	----
Ortho-phosphate	24	11	-22	10	-266	-24	-218	-216	9	-3	0	----	----	----
Particulate P	----	----	39	16	----	----	----	----	----	----	----	----	----	----
Phosphorus	39	44	39	15	5	49	-106	-46	17	18	15	----	----	----
Total Cu	50	66	58	27	89	54	63	85	53	35	8	0	2	2
Total PB	87	85	72	30	98	62	68	88	52	74	11	1	7	7
Total Zn	80	92	73	54	91	62	77	72	51	75	17	1	2	2
Particulate Cu	----	----	76	50	----	----	----	----	----	----	----	----	----	----
Particulate Pb	----	----	74	55	----	----	----	----	----	----	----	----	----	----
Particulate Zn	----	----	84	65	----	----	----	----	----	----	----	----	----	----
Dissolved Cu	7	40	0	8	57	90	49	65	18	22	16	----	----	----
Dissolved Pb	40	31	29	42	76	22	57	65	15	32	6	----	----	----
Dissolved Zn	61	94	16	39	41	45	74	53	18	71	14	----	----	----
TPH-Oil[B]	31	55	18	11	38	33	51	59	52	70	34	----	----	14
TPH-Gasoline[B]	----	----	----	----	----	----	----	----	----	----	0	----	----	----
TPH-Diesel[B]	22	47	32	0	91	75	69	66	67	80	0	----	----	52
Fecal Coliform[B]	72	79	-122	-12	99	99	-30	92	47	14	-121	----	----	----
Hydrocarbons	----	----	----	----	----	----	----	----	----	----	----	2	0	----
Oil & Grease	----	----	----	----	----	----	----	----	----	----	----	----	----	89

(-) data above indicates an increase in pollutant of concern upon treatment.

[A] Sum of NO_3-N and TKN

[B] TPH and Coliform are collected by grab method and may not accurately reflect removal.

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Table T.3: Treatment Control BMP Removal Efficiency Per Center for Watershed Protection

Pollutant of Concern	Treatment Control BMPs Average Percentage Removed (%)						
	Dry Pond	Wet Pond	Wetlands	Filters	Bioretention	Infiltration	Open Channels
Total Suspended Solids (TSS)	49	80	72	86	59	89	81
Total Phosphorus (TP)	20	52	48	59	5	65	24
Soluble Phosphorus (Sol P)	-3	64	25	3	-9	85	-38
Total Nitrogen (TN)	24	31	24	32	46	42	56
Nitrogen as Nitrate (NOx)	9	45	67	-14	43	0	39
Copper (Cu)	29	57	47	37	81	86	65
Zinc (Zn)	29	64	42	87	79	66	71
Bacteria	88	70	78	37	N/A	N/A	-25

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Table T.4: Catch Basin Trash Removal Totals				
Jurisdiction	**Dominguez Channel Watershed**			
	Number of City Catch Basins	**Number of County Catch Basins**	**Total City Trash Removed**	**Total County Trash Removed**
			Tons	**Tons**
2010-2011[1]				
El Segundo	0	159	0.00	1.78
Hawthorne	118	823	1.32	9.23
Inglewood	41	549	0.00	6.16
Lomita	41	215	0.46	2.41
Los Angeles	0	1,221	0.00	13.69
Los Angeles County	0	1,347	0.00	15.11
Total/Average:	**159**	**4,314**	**1.78**	**48.38**
2011-2012[1]				
El Segundo	0	159	0.00	1.39
Hawthorne	118	824	1.03	7.19
Inglewood	0	549	0.00	4.79
Lomita	41	215	0.36	1.88
Los Angeles	0	1,221	0.00	10.65
Los Angeles County	0	1,342	0.00	11.71
Total/Average:	**159**	**4,310**	**1.39**	**37.61**

[1] An average of 22.43 lbs of trash per catch basin was removed.
[2] An average of 17.45 lbs of trash per catch basin was removed.

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Attachment U

Cost Estimates

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Darby Park Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$396,000	$396,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$99,000	$99,000
Subtotal:				**$520,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$396,000	$396,000
Subtotal:				**$396,000**
Construction				
Mobilization (10%)	LS	1	$360,000	$360,000
Excavation	CY	21,000	$6	$126,000
Fill	CY	10,000	$6	$60,000
Soil Export	CY	12,000	$25	$300,000
Landscaping and Irrigation	SF	29,000	$2	$58,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	100	$200	$20,000
Storage (Pipes)	GAL	1,710,000	$1.75	$2,993,000
Contingency (25%)	LS	1	$990,000	$990,000
Subtotal:				**$4,947,000**
Total:				**$5,863,000**

El Segundo Pump Station Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$109,000	$109,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$28,000	$28,000
Subtotal:				**$162,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$109,000	$109,000
Subtotal:				**$109,000**
Construction				
Mobilization (10%)	LS	1	$99,000	$99,000
Excavation	CY	29,000	$6	$174,000
Soil Export	CY	29,000	$25	$725,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	240	$200	$48,000
Contingency (25%)	LS	1	$272,000	$272,000
Subtotal:				**$1,086,000**
Total:				**$1,357,000**

Ramona Park Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$1,410,000	$1,410,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$353,000	$353,000
Subtotal:				**$1,788,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$1,410,000	$1,410,000
Subtotal:				**$1,410,000**
Construction				
Mobilization (10%)	LS	1	$1,282,000	$1,282,000
Excavation	CY	77,000	$6	$462,000
Fill	CY	41,000	$6	$246,000
Soil Export	CY	37,000	$25	$925,000
Landscaping and Irrigation	SF	52,000	$2	$104,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	680	$200	$136,000
Storage (Concrete)	LS	6,230,000	$1.75	$10,903,000
Contingency (25%)	LS	1	$3,525,000	$3,525,000
Subtotal:				**$17,623,000**
Total:				**$20,821,000**

Jim Thorpe Park Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$1,227,000	$1,227,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$307,000	$307,000
Subtotal:				**$1,559,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$1,116,000	$1,116,000
Subtotal:				**$1,116,000**
Construction				
Mobilization (10%)	LS	1	$1,116,000	$1,116,000
Excavation	CY	90,000	$6	$540,000
Fill	CY	55,000	$6	$330,000
Soil Export	CY	36,000	$25	$900,000
Landscaping and Irrigation	SF	87,000	$2	$174,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	170	$200	$34,000
Storage (Pipes)	GAL	5,220,000	$1.75	$9,135,000
Contingency (25%)	LS	1	$3,068,000	$3,068,000
Subtotal:				**$15,337,000**
Total:				**$18,012,000**

Hawthorne Memorial Park Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$641,000	$641,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$161,000	$161,000
Subtotal:				**$827,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$583,000	$583,000
Subtotal:				**$583,000**
Construction				
Mobilization (10%)	LS	1	$583,000	$583,000
Excavation	CY	36,000	$6	$216,000
Fill	CY	19,000	$6	$114,000
Soil Export	CY	18,000	$25	$450,000
Landscaping and Irrigation	SF	36,000	$2	$72,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	1,300	$200	$260,000
Storage (Pipes)	GAL	2,671,000	$1.75	$4,675,000
Contingency (25%)	LS	1	$1,603,000	$1,603,000
Subtotal:				**$8,013,000**
Total:				**$9,423,000**

Chester L. Washington Golf Course Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$4,039,000	$4,039,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% of Design)	LS	1	$1,010,000	$1,010,000
Subtotal:				**$5,074,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$4,039,000	$4,039,000
Subtotal:				**$4,039,000**
Construction				
Mobilization (10%)	LS	1	$3,672,000	$3,672,000
Excavation	CY	336,000	$6	$2,016,000
Fill	CY	232,000	$6	$1,392,000
Soil Export	CY	104,000	$25	$2,600,000
Landscaping and Irrigation	SF	238,000	$2	$476,000
Diversion Structure	EA	2	$40,000	$80,000
Diversion Pipe	LF	880	$200	$176,000
Storage (Pipes)	GAL	8,510,000	$1.75	$14,893,000
Storage (Concrete)	GAL	8,620,000	$1.75	$15,085,000
Contingency (25%)	LS	1	$10,098,000	$10,098,000
Subtotal:				**$50,488,000**
Total:				**$59,601,000**

Harbor City Park Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$5,760,000	$5,760,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$1,440,000	$1,440,000
Subtotal:				**$7,225,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$5,760,000	$5,760,000
Subtotal:				**$5,760,000**
Construction				
Mobilization (10%)	LS	1	$5,236,000	$5,236,000
Excavation	CY	240,000	$6	$1,440,000
Fill	CY	83,000	$6	$498,000
Soil Export	CY	158,000	$25	$3,950,000
Landscaping and Irrigation	SF	186,000	$2	$372,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	80	$200	$16,000
Storage (Concrete)	GAL	26,310,000	$1.75	$46,043,000
Contingency (25%)	LS	1	$14,399,000	$14,399,000
Subtotal:				**$71,994,000**
Total:				**$84,979,000**

Wilmington Recreation Center Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$981,000	$981,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$246,000	$246,000
Subtotal:				**$1,252,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$892,000	$892,000
Subtotal:				**$892,000**
Construction				
Mobilization (10%)	LS	1	$892,000	$892,000
Excavation	CY	67,000	$6	$402,000
Fill	CY	40,000	$6	$240,000
Soil Export	CY	27,000	$25	$675,000
Landscaping and Irrigation	SF	52,000	$2	$104,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	470	$200	$94,000
Storage (Concrete)	GAL	4,204,000	$1.75	$7,357,000
Contingency (25%)	LS	1	$2,451,000	$2,451,000
Subtotal:				**$12,255,000**
Total:				**$14,399,000**

Averill Park Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$1,726,000	$1,726,000
Permits	LS	1	$25,000	$25,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$432,000	$432,000
Subtotal:				**$2,183,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$1,726,000	$1,726,000
Subtotal:				**$1,726,000**
Construction				
Mobilization (10%)	LS	1	$1,569,000	$1,569,000
Excavation	CY	189,000	$6	$1,134,000
Fill	CY	142,000	$6	$852,000
Soil Export	CY	48,000	$25	$1,200,000
Landscaping and Irrigation	SF	116,000	$2	$232,000
Diversion Structure	LS	1	$40,000	$40,000
Diversion Pipe	LF	60	$200	$12,000
Storage (Pipes)	GAL	6,980,000	$1.75	$12,215,000
Contingency (25%)	LS	1	$4,314,000	$4,314,000
Subtotal:				**$21,568,000**
Total:				**$25,477,000**

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Green Street Cost Estimate

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Green Street Cost Estimate for 1,000 Linear Feet in One Lane				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$17,000	$17,000
Permits	LS	1	$5,000	$5,000
Environmental Assessment (CEQA) (25% Design)	LS	1	$5,000	$5,000
Subtotal:				**$27,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$31,000	$31,000
Subtotal:				**$31,000**
Construction				
Mobilization (10%)	LS	1	$31,000	$31,000
Excavation	CY	2230	$6	$13,400
Soil Export	CY	1780	$25	$44,500
AC Demo	SY	1600	$40	$64,000
Reconstruct AC	TONS	510	$125	$63,800
Crushed Misc Base	CY	270	$70	$18,900
Pipe System for Capture	LF	500	$200	$100,000
Gravel	TONS	1	$70	$100
Contingency (25%)	LS	1	$84,000	$84,000
Subtotal:				**$419,700**
Total:				**$477,700**

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Injection Wells Cost Estimate

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Injection Wells Cost Estimate				
Description	**Unit**	**Quantity**	**Unit Price**	**Item Total**
Engineering				
Design Plan and Specifications (10%)	LS	1	$110,000	$110,000
Permits	LS	1	$500	$500
Environmental Assessment (CEQA) (25% Design)	LS	1	$27,500	$27,500
Subtotal:				**$138,000**
Construction Support				
Construction Administration and Inspections (10%)	LS	1	$100,000	$100,000
Subtotal:				**$100,000**
Construction				
Mobilization (10%)	LS	1	$100,000	$100,000
Injection Well	EA	1	$1,000,000	$1,000,000
Contingency (25%)	LS	1	$275,000	$275,000
Subtotal:				**$1,375,000**
Total:				**$1,613,000**

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Attachment V

Funding

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TECHNICAL MEMORANDUM

To: Dominguez Channel Watershed Management Group

From: Team Dominguez

Date: 3/13/2015

Subject: **Dominguez Channel Watershed Management Plan Funding Strategy - DRAFT**

1 Introduction

The following memorandum identifies existing funding sources for stormwater related projects, eligibility requirements for each grant or low-cost loan program, and a description of the associated application process.

The Dominguez Channel Watershed Management Group Area ("WMGA") has opted to develop an Enhanced Watershed Management Plan ("EWMP") to meet newly adopted Municipal Separate Stormwater Sewer System ("MS4") Permit requirements. The WMGA is comprised of the area within the DC watershed under the jurisdiction of the Cities of Los Angeles, El Segundo, Hawthorne, Inglewood, Lomita, and the Los Angeles County Department of Public Works (unincorporated Los Angeles County) and the Los Angeles County Flood Control District.

Within the DCWMGA, nine regional projects have been identified for inclusion in the EWMP Each of these projects will collect, store, and infiltrate a volume of water from the 85^{th} Percentile storm from a catchment area. Some projects have the opportunity to use the stored water for irrigation at the park or property at which the project is sited.

In addition, the WMGA is considering the inclusion of a range of distributed projects to capture, infiltrate, evapotranspirate, use, or treat, the water not captured by the regional projects in order to achieve the pollutant load reduction objectives of the EWMP. The primary set of these projects consist of a substantial green street conversion program.

As a part of the EWMP process the WMGA must consider how the nine capital projects as well as the green street conversion projects will be funded. This report details available funding options, including grant programs and low cost financing programs at the state and federal level. The options available may be used to fund a portion of the capital projects, however other avenues will also need to be researched as a majority of the grant and loan programs require local matching funds.

Moreover, it is important to consider that California as a state needs significant funding to achieve all its clean water goals. The most recent Clean Watersheds Needs Survey in 2008 shows that California needs an estimated $30.0 billion for wastewater recycling, non-point source pollution elimination and stormwater pollution prevention over the next 20 years. With an estimated need for $30.0 billion in funding, available funding sources are drying up quickly and there is increased competition for the available funds. For the Dominguez Channel WMGA to be able to successfully fund the proposed projects a mix of both grant and loan funding as well as other revenue sources will need to be utilized.

2 Available Funding Options

The following section provides an overview of grant funding and low interest loan funding available through State and Federal programs. The agencies responsible for implementing and managing the programs each have their own set of guidelines and priorities for project selection and funding. The table below provides a summary of the available programs and the project selection criteria for each program.

Funding Source	Priority Project Elements									
	Drought Preparedness	Increase Local Water Supply	Conservation Programs	Water Quality	Pollution Reduction	Flood Management Programs	Drinking Water Protection	Ecosystem Protection	Restoration	Public Health/ Environmental Impact
EPA Section 319				X	X					
Proposition 1:										
Regional Water Security		X		X				X	X	
Flood Management		X		X				X	X	
Clean, Safe, Reliable Drinking Water		X		X			X	X	X	
Water Recycling		X		X				X	X	
Ecosystem and Watershed Protection		X		X				X	X	
Groundwater Sustainability		X		X				X	X	X
Water Storage Capacity		X		X				X	X	
Clean Beaches Initiatives				X	X			X	X	
TIGER Discretionary*				X						
Supplemental Environmental Project Funds:										
Federal			X	X	X					X
State			X	X	X			X	X	
Clean Water State Revolving Fund	X			X	X					X
California Infrastructure Development Bank – Infrastructure State Revolving Fund Program				X		X				
* Transportation projects that are coordinated with interdisciplinary factors including Stormwater and other infrastructure investments										

3 Grant Funding

3.1 Integrated Regional Water Management Plan

The Department of Water Resources (DWR) administers the Integrated Regional Water Management (IRWM) grant program. The IRWM grant program is designed to encourage integrated regional strategies for management of water resources and to provide funding for implementation projects that support integrated water management.

Of the funding options available through the IRWM grant program only the Implementation Program has funds available to be allocated. According to DWR's 2014 IRWM Drought Solicitation Integrated Regional Water Management Guidelines, issued in June 2014, both the Planning and the Stormwater Flood Management grant programs have fully allocated funds from available funding sources.

In 2014 the California state legislature passed SB 103 and SB 104, which accelerated the expenditure of the remaining $472.5 million in funds through the Implementation grant program. The program is meant to fund local and regional projects that are already planned or partially completed to increase local reliability, including recapturing of storm water, expanding the use and distribution of recycled water, enhancing the management and recharging of groundwater storage and strengthening water conservation. On October 30, 2014, DWR awarded $221 million out of the remaining $472.5 million to 27 proposals to fund projects costing more than $780 million. The remaining $251 million will be awarded in 2016 as a part of the final round of IRWM grant funding.

3.1.1 2014 IRWM Drought Solicitation Integrated Regional Water Management Guidelines

The guidelines for the final phase of IRWM funding have not yet been made available, however it is likely the guidelines for the final phase will be similar to the 2014 guidelines given California's lingering state of drought. The following sections provide a summary of the 2014 guidelines.

IRWM Grants are awarded on a competitive basis using specific criteria contained in the Proposal Solicitation Package (PSP) published by DWR. In addition to PSP specific requirements, applicants must follow eligibility and proposal guidelines issued by DWR. The 2014 IRWM Drought Guidelines incorporate new requirements and reflect the expedited nature of the 2014 IRWM Drought Grant Solicitation.

Eligibility Requirements

Local public agencies and non-profit organizations are eligible IRWM grant applicants. [1] Applications for IRWM grants must meet all of the eligibility criteria listed below in order to be considered for funding:

- The IRWM region where the project is located must have been accepted into the IRWM Grant Program
- Projects included in the proposal must be included in an IRWM plan

[1] For the IRWM Implementation Grant Program, the grant applicant is the agency submitting an application on behalf of an IRWM region and is the agency that would enter an agreement with the State, should the application be successful. At DWR's discretion, partner entities or IRWM stakeholders may be part of the proposal as a project proponent and access grant funding through their relationship with the grant applicant. Stakeholders as defined by CWC § 10541 include municipal and county governments and special districts.

- If they have not done so prior to submitting the proposal, project proponents must adopt the IRWM Plan
- Groundwater Management Plan (GWMP) compliance[2]
- Urban Water Management Plan Compliance[3]
- Agriculture Water Management Plan Compliance[4]
- Surface Water Diversion Reporting Compliance[5]
- AB1420 Water Demand Compliance[6]
- CWC §529.5 Water Meter Compliance[7]
- CWC §10920 Groundwater monitoring Compliance[8]

Eligible Project Types

Projects that are eligible to receive funds through the 2014 IRWM Drought Grant Solicitation must provide one of the following primary benefits:

- Immediate regional drought preparedness
- Increase local water supply reliability and the delivery of safe drinking water
- Assist water suppliers and regions to implement conservation programs and measures that are not locally cost-effective
- Reduce water quality conflicts or ecosystem conflicts created by the drought

Eligible projects must also yield multiple benefits; and include one or more of the following elements[9]:

- Water supply reliability, water conservation, and water use efficiency
- Stormwater capture, storage, clean-up treatment and management
- Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands
- Non-point source pollution reduction, management, and monitoring
- Groundwater recharge and management projects
- Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users
- Water banking, exchange, reclamation, and improvement of water quality
- Planning and implementation of multipurpose flood management programs

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[2] For groundwater projects or for projects that directly affect groundwater levels or quality, the applicant or project proponent must self certify that they have prepared and implemented a Groundwater Management Plan (GWMP), that they participate in a GWMP, or the proposal includes development of a GWMP.

[3] Water suppliers proposing a project who were required by the Urban Water Management Planning Act to submit an Urban Water Management Plan to DWR must comply with this requirement to qualify.

[4]This requirement is applicable to agricultural water suppliers

[5] A diverter of surface water must comply with surface water diversion reporting requirements codified in the California Water Code (CWC

[6] Urban water suppliers must implement water demand management measures described in CWC §10631.

[7] Applicants for wastewater treatment projects, water use efficiency projects, drinking water treatment projects shall demonstrate that they meet the water meter requirements in CWC §525

[8] Meet groundwater monitoring requirements set out in CWC §10920

[9] Defined by PRC §75026(a) as other benefit(s)

- Watershed protection and management
- Drinking water treatment and distribution
- Ecosystem and fisheries restoration and protection

Program Preferences

Proposals that include the following shall be given preference:

- Include regional projects or programs
- Effectively integrate water management programs and projects within a hydrologic region identified in the California Water Plan; the Regional Water Quality Control Board (RWQCB) region or subdivision; or other region or sub-region specifically identified by DWR
- Effectively resolve significant water-related conflicts within or between regions
- Contribute to attainment of one or more of the objectives of the CALFED Bay-Delta Program
- Address critical water supply or water quality needs of Disadvantaged Community (DAC)
- Effectively integrate water management with land use planning
- Are part of an IRWM Plan that helps the region reduce reliance on the Sacramento-San Joaquin Delta for water supply (for IRWM regions that receive water from the Sacramento-San Joaquin Delta)
- Address statewide priorities

Minimum Funding Match Requirements

For IRWM Implementation Grants, including the 2014 IRWM Drought Grant solicitation, the minimum-funding match is 25%. Funding match may include, but is not limited to, federal funds, local funding, or donated services from non-state sources. For IRWM implementation projects that address the needs of a DAC and are seeking Proposition 84 funds, funding matches may be waived.

3.2 EPA Section 319 Grants

Section 319 of the Clean Water Act (CWA) authorizes the EPA to develop a grant program aimed at implementing nonpoint source (NPS) management programs. The 319 grant funds are appropriated to states and administered by the EPA regional offices. In 2014 the EPA allocated a total of $159.3 million in 319 Grant funding to various states throughout the country.

Funding appropriated under Section 319 can be used to implement state NPS programs including, as appropriate, non-regulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects to achieve implementation of best management practices and water quality goals.

States are prohibited from using Section 319 funds for urban stormwater activities that directly implement a final municipal separate storm sewer system (MS4) NPDES permit. However, Section 319 funds may be used for those urban stormwater activities that do not directly implement a final NPDES permit. This means that the urban stormwater activity being funded cannot be explicitly required in a permit or plan required by the NPDES permit. These include activities that may support but do not directly implement permits requirements. However, EPA supports flexibility in funding green infrastructure and low impact development (LID) employed in managing stormwater through the Section 319 Grant Program.

3.2.1 California Section 319 Guidelines

The State Water Resources Control Board ("SWRCB") is responsible for State project development and managing the State project solicitation process for the Section 319 Grant Program. SWRCB has begun the project selection process for 2015 and has announced that it has $4 million in Section 319 Grant funds to allocate to eligible projects. Up to $1.0 million will be available for planning and assessment projects and approximately $3.0 million will be available for implementation projects.

Eligibility Requirements

Project eligibility is based on whether the project fits within the NPS Program Preferences, program funding limits, project timing, and match requirements. Eligible applicants include local public agencies, public agencies, nonprofit organizations, federally recognized Indian tribes, state agencies, public colleges, and federal agencies.

Program preferences are organized by region. The preferences for the Los Angeles Regional Water Board fall within the following watersheds:

- Calleguas Creek
- Santa Clara River
- McGrath Lake
- Ventura River
- Marina del Rey Harbor

Eligible Project Types

Eligible planning and assessment project types or the watersheds listed above include:

- Assessment, study or design identified as a high priority in a TMDL
- Studies, strategies, management plans, tools for management plan development and similar items
- Filling recognized Data Gaps
- Consolidating previously completed planning work in a watershed; or
- Identifying and prioritizing appropriate management measure and management practices

Eligible planning and assessment projects and or applicants must:

- Address watersheds and impairments identified in the NPS Program Preferences;
- Meet funding match requirements
- Clearly lead to implementation of an adopted or nearly adopted TMDL designated in the NPS Program Preferences;
- Have at least elements 1, 2, and 3 of US EPA's nine key elements of a watershed based plan (Nine Key Elements) in place at the time of funding[10]

[10] These elements pertain to identification of causes and sources of impairments, estimating load reductions expected from management activities, and identifying management measures and priority locations for implementation.

And meet one of the following:

- Complete watershed planning and assessment to fully address all Nine Key Elements
- Provide information necessary to fully develop at least one of the missing or partially completed elements
- Complete other priority planning and assessment activities and provide a brief description of how the missing or incomplete elements of the Nine Key Elements will be completed

Eligible implementation project types include project-level planning, design, construction, construction management, implementation and monitoring to implement full scale on-the-ground management measures and/or management practices.

Project Scoring Criteria

The application process is a two-phase process that requires applicants to successfully develop a concept proposal before they are able to move on to the complete proposal phase. Both the concept and full proposals are evaluated and scored using the criteria listed below:

- Describes the physical watershed, including the targeted watershed's waterbody size (stream miles or acreage) and area, and the portion of the watershed (percent miles or area) that the project will address;
- Describes how the project will implement activities that are identified as high priority actions in an adopted or nearly adopted TMDL;
- Describes how the project will lead to a significant reduction of a major pollutant source in an adopted or nearly adopted TMDL
- Describes how the project is related to other efforts, both past and present, along with how its coordination with current efforts will effectively address impairment(s)
- Provides an estimate of the overall progress achieved to date in the watershed in meeting specific TMDL targets and/or goals;
- Specifies an estimated measurable pollutant load or pollutant concentration reduction, if the project is an implementation project;
- Demonstrates that the project is technically feasible and appropriate, and identifies if it has been adapted from another effort, and describes how the approach is applicable;
- Describes how success will be measured through appropriate assessment and monitoring
- Demonstrates the connectivity between the proposed project and the waterbody addressed by the TMDL;
- Clearly describes project goals, milestones, tasks and timelines;
- Demonstrates relevant experience and expertise of the project team;
- Demonstrates if and how the project could be repeated in another watershed;
- Shows readiness to proceed; and
- Demonstrates adequate funding match

Matching Funds

Applicants must provide a minimum 25% funding match. State agencies, may use State funds and services for the funding match. A funding match may include federal funds, local funding, or donated, volunteer and in-kind services from non-State sources.

3.3 Proposition 1

Proposition 1, The Water Quality, Supply, and Infrastructure Improvement Act of 2014, was overwhelmingly approved by voters last November and will make $7.545 Billion in bond funding available for water projects throughout the state. The funding provided by Proposition 1 will be used to implement the three objectives of the California Water Action Plan, which are more reliable water supplies, the restoration of important species and habitat, and a more resilient and sustainably managed water infrastructure.

In addition to the funding available through the sale of general obligation bonds, Proposition 1 is expected to leverage an addition local and regional funds to provide a total investment of $25 billion to $30 billion to address California's water needs.

3.3.1 Key Funding Areas

Regional Water Security: $810 million

Chapter 7, section 79740 of Proposition 1 make $810 million available for expenditure on, and competitive grants and loans to, projects that are included in and implemented in an adopted integrated regional water management plan (IRWM) and respond to climate change and contribute to regional water security.

Of the $810 million available pursuant to this chapter, $200 million shall be available for grants for multi-benefit stormwater management projects. Eligible projects may include green infrastructure, rainwater and stormwater capture projects, and stormwater treatment facilities. Plans for stormwater projects must address the entire watershed and incorporate the perspectives of communities adjacent to the affected waterways, especially disadvantaged communities.

Cost sharing provisions in this chapter require a cost share from non-state sources of at least 50% of the total costs of the project.

Flood Management: $395 million

Chapter 11, section 79780 makes $395 million available to the Department of Water Resources and the Central Valley Flood Protection Board for the purpose of statewide flood management projects and activities. Funds shall be allocated to multi-benefit projects that achieve public safety and include fish and wildlife habitat enhancement. The Department of Water Resources shall make efforts to coordinate this funding with Proposition 84 and 1E funding.

However, of the funds authorized by this section $295 million will be set aside to reduce the risk of levee failure and flood in the Sacramento and San Joaquin Bay Delta. This leaves only $100 million for other flood management projects statewide.

Clean, Safe and Reliable Drinking Water: $520 million

Section 72720, Chapter 5, of Proposition 1 allocates a sum of $520 million for expenditures, grants, and loans for projects that improve water quality or help provide clean, safe and reliable drinking water to the citizens of California.

Of the $520 million authorized by Section 79270, $260 million dollars will be deposited in the State Water Pollution Control Revolving Fund (SWPCRF) Small Community Grant Fund for grants for wastewater treatment projects.

Of the $520 million authorized by Section 79270, an additional $260 million shall be available for grants and loans for public water system infrastructure improvements and related actions to meet safe drinking water standards ensure affordable drinking water, or both.

Projects eligible for funding pursuant to this chapter must help improve water quality for a beneficial use and must further the following purposes:

- Reduce contaminants in drinking water supplies regardless of the source of the water or the contamination
- Assess and prioritize the risk of contamination to drinking water supplies
- Address the critical and immediate needs of disadvantaged, rural, or small communities that suffer from contaminated drinking water supplies, including, but not limited to, projects that address a public health emergency
- Lever other private, federal, state, and local drinking water quality and wastewater treatment funds
- Reduce contaminants in discharges, to, and improve the quality of the waters of the state
- Prevent further contamination of drinking water supplies
- Provide disadvantaged communities with public drinking water infrastructure that provides clean, safe, and reliable drinking water supplies that the community can sustain over the long term
- Ensure access to clean, safe, reliable, and affordable drinking water for California's communities
- Meet primary and secondary safe drinking water standards or remove contaminants identified by the state or federal government for development of a primary or secondary drinking water standard.

Water Recycling: $725 million

Chapter 9, section 79765 makes $725 million available for grants or loans for water recycling and advanced treatment technology projects, including all of the following:

- Water recycling projects, including, but not limited to, treatment storage, conveyance, and distribution facilities for potable and non-potable recycling projects
- Contaminant and salt removal projects including, but not limited to groundwater, and seawater desalination and associated treatment storage, conveyance and distribution facilities
- Dedicated distribution infrastructure to serve residential, commercial, agricultural, and industrial end-user retrofit projects to allow use of recycled water.
- Multi-benefit recycled water projects that improve water quality
- Technical assistance and grant writing assistance for disadvantaged communities

Ecosystem and Watershed Protection: $1.495 billion

Chapter 6, section 79730 of Proposition 1 makes available $1.495 billion for competitive grants for multi-benefit ecosystem and watershed protection and restoration projects in accordance with statewide priorities. The funds are reserved for projects that will provide fisheries or ecosystem benefits or improvements that are greater than required applicable environmental mitigation measure or compliance obligations.

Groundwater sustainability: $900 million

Chapter 10, Section 79771 allocates $900 million for expenditures on, and competitive grants and loans for projects to prevent or cleanup the contamination of groundwater that serves or has served as a source of drinking water. Funds appropriated pursuant to this section shall be available to the state board for projects necessary to protect public health by preventing or reducing the contamination of groundwater that serves or has served as a major source of drinking water for a community.

Water Storage Capacity: $2.7 billion

Chapter 8, Section 79750 of Proposition 1 appropriates $2.7 billion to the California Water Commission for water storage projects. Projects will be selected by the Commission through a competitive public process that ranks potential projects based on the expected return for public investment as measured by the magnitude of the public benefits provided.

3.3.2 Proposition 1 Guidelines

The bond funds will be distributed through a competitive grant process overseen by various state agencies, including the DWR, SWRCB, and the California Water Commission (CWC). These agencies will conduct processes to solicit proposals for grants, review applications and award funding. The first step in this process is to develop guidelines that spell out the total amount of funding available for various programs and the criteria agencies will apply to evaluate and rank projects for funding. Proposition 1 requires responsible agencies post the draft guidelines on their respective websites for at least 30 days, hold three public meetings, and solicit public input prior to finalizing the guidelines. The following table provides a timetable for the development of the guidelines and the responsible agencies.

Category	Agency	Guideline Process Expected Start	Guideline Process Expected Completion
Small community wastewater treatment	State Water Resources Control Board	March 2015	June 2015
Safe and affordable drinking water	State Water Resources Control Board	May 2015	July-Aug. 2015
Multi-benefit watershed projects	State Conservancies (various)	Jan.-Feb. 2015	Various dates
Enhanced stream flows	Wildlife Conservation Board	Feb. 2015	May 2015

Category	Agency	Guideline Process Expected Start	Guideline Process Expected Completion
Urban creek restoration	State Conservancies (various)	In process	TBD
State obligations in water-related settlements	Natural Resources Agency	In process	TBD
Watershed and Urban River Enhancements	Natural Resources Agency	In process	TBD
Watershed restoration and Delta water quality and ecosystem restoration	Department of Fish and Wildlife	Jan. 2015	May 2015
Integrated regional water management	Department of Water Resources	March 2015	2016 (Final Round of Prop 84 in progress and to be awarded by Aug. 2015)
Water Use Efficiency Grants, Round 1 – Urban and Agricultural	Department of Water Resources	July 2015	Dec. 2015
Stormwater management	State Water Resources Control Board	In process	TBD
Water Storage Investment Program	California Commission	Jan. 2015	Submission of draft regulations to Office of Administrative Law by Oct. 2015 (OAL process may take up to 12 months)
Water recycling	State Water Resources Control Board	April 2015	June 2015
Groundwater Plans and Project Grant Program – Phase 1	Department of Water Resources	March 2015	TBD
Groundwater Sustainability (cleanup)	State Water Resources Control Board	In process	TBD

Category	Agency	Guideline Process Expected Start	Guideline Process Expected Completion
Multi-benefit projects to achieve public safety and enhance fish/wildlife, including Delta levee maintenance and improvements	DWR/Central Valley Flood Protection Board	In process	TBD

3.4 Clean Beaches Initiatives

The Clean Beaches Initiative (CBI) Grant Program provides funding for projects that restore and protect the water quality and the environment of coastal waters, estuaries, bays, and near shore water. In June 2010, Senate Bill (SB) 790 became law, amending the CBI Grant Program and authorizing the program to fund projects designed to implement or promote low impact development, and project designed to implement a stormwater resource plan.

3.4.1 Eligibility Requirements

To be eligible for funding, the applicant must be an eligible entity, and the projects must 1) be an eligible project type and 2) address at least one of the CBI Grant Program priorities.

Eligible Project Type

The following are eligible project types:

- Improve water quality at public beaches and make improvements to ensure that coastal waters adjacent to public beaches meet bacteriological standards as set forth in the Health and Safety Code
- Make improvements, upgrades, or conversions to existing sewer collection systems and septic systems for the restoration and protection of coastal water quality.
- Implement stormwater and runoff pollution reduction and prevention programs, or for the implementation of best management practices (BMPs), for the restoration and protection of coastal water quality.
- Implement or promote low-impact development (LID) for new or existing developments that will contribute to the improvement of water quality or reduce stormwater runoff.
- Implement a stormwater resource plan prepared pursuant to WC §10560.

All CBI projects must meet the following requirements:

- Stay consistent with State Water Board's NPS control program, and the requirements of Division 7 (commencing with §13000) of the Water Code.
- All projects must demonstrate the capability of contributing to sustained, long-term water quality or environmental restoration or protection benefits for a period of 20 years, address the causes of degradation, rather than the symptoms, and be consistent with water quality and resource protection plans prepared, implemented, or adopted by the State Water Board, the applicable Regional Water Quality Control Boards (Regional Water Boards), and the State Coastal Conservancy.

- Applicants receiving CBI funds must submit to the Division a monitoring and reporting plan that does all of the following: 1) identifies the nonpoint source(s) of pollution to be prevented or reduced by the project; 2) describes the baseline water quality or quality of the environment to be addressed; 3) describes the manner in which the project will be effective in preventing or reducing pollution and in demonstrating the desired environmental results; and 4) describes the monitoring program, including, but not limited to, the methodology, the frequency and duration of monitoring.
- If applicable, projects funded must be consistent with recovery plans for coho salmon, steelhead trout, or other threatened or endangered species, and to the extent feasible, must seek to implement actions specified in those plans.
- Meet other reporting requirements

The CBI Grant Program's primary focus is the reduction of bacterial concentrations at public beaches. Eligible projects must address at least one CBI priority. CBI has developed priorities for both implementation and research projects. This report will discuss priorities for implementation projects only.

For capital improvement projects to receive funding from the CBI Grant Program, the project must be one that reduces bacterial contamination at priority beaches. Priority beaches are those that meet any one of the following five criteria:

- The beach is located adjacent to an ASBS subject to dry weather runoff;
- High frequency (>4 percent) of bacterial standard exceedences during weekly monitoring of coastal waters April 1 to October 31, as specified in the Health and Safety Code
- A known public health threat or source of human sewage discharge to ocean waters adjacent to a beach;
- The beach received a grade of "C", "D", or "F" on Heal the Bay's report card at least once during the previous three AB 411 time periods (April 1 to October 31) or during dry weather year-round; or
- Demonstrated bacterial contamination problems.

The Clean Beach Task Force has identified a number of priority beaches. A list of these beaches is attached as an appendix.

In the competitive process priority will be given to projects that meet the following program preferences:

- Have solid baseline water quality data;
- Integrate into a larger project and provide multiple-benefits;
- Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards by implementing a total maximum daily load (TMDL);
- Eliminate or significantly reduce pollution into areas of special biological significance (ASBS);
- Improve water quality in a disadvantaged community;
- Are LID that contribute to stormwater quality improvements;
- Promote the infiltration, capture, and treatment of stormwater for reuse consistent with supporting beneficial uses and existing water rights;

- Meet sustainability and other considerations as outlined in the Ahwahnee Principles or similar land use or planning principles;
- Address the impacts of climate change, including the minimization of greenhouse gas emission;
- Provide local cost-sharing or leverage local bond measure funds;
- Address environmental justice community needs and issues; and
- Contribute to a 75 percent reduction of wet weather beach postings by 2020

Grant Amounts and Funding Match

The maximum grant amount available through CBI is $5 million and the minimum grant amount is $150,000. Applicants must provide a 20% for Projects $1,000,000 to $5,000,000 (inclusive) 15% for Projects less than $1,000,000 75% for sewer infrastructure Projects.

3.5 TIGER Discretionary Grants

The Consolidated Appropriations Act, 2014 appropriated $600 million to be awarded by the Department of Transportation (DOT) for National Infrastructure Investments. DOT refers to this program as the TIGER Discretionary Grants. The grants are to be awarded on a competitive basis for projects that will have a significant impact on the Nation, on metropolitan area, or a region.

3.5.1 Eligibility Requirements

To receive TIGER Discretionary Grant funding, projects or elements of a project must have independent utility, which means that the project provides transportation benefits and is ready for its intended use upon completion of project construction.

DOT is required to obligate TIGER funds by September 30, 2016. Therefore, successful applicants must also demonstrate the project will proceed to obligation within the statutory deadline upon receipt of a TIGER Discretionary Grant.

Eligible Project Types

Projects that are eligible for TIGER Discretionary Grants for capital projects include, but are not limited to:

- Highway or bridge projects (including bicycle and pedestrian related projects)
- Public transportation projects
- Passenger and freight rail transportation projects
- Port infrastructure investments
- Intermodal projects

Projects eligible for TIGER Planning Grants include, but are not limited to:

- Activities related to the planning preparation or design of a single surface transportation projects
- Activities related to regional transportation investment planning
- Transportation planning that is coordinated with interdisciplinary factors including
    - Housing,
    - Economic development

- Stormwater and other infrastructure investments

- Transportation planning that addresses future risks and vulnerabilities, including extreme weather and climate change

TIGER Discretionary Grants cannot be directly applied to stormwater management projects. However, TIGER Discretionary Grants may fund green infrastructure projects related to transportation, including green streets.

Selection Criteria

In selecting a project to fund through the TIGER Discretionary Grants, DOT has indentified a set of primary selection criteria based on the DOT strategic plan. The following are the primary selection criteria:

- State of Good Repair – improving the condition of existing transportation facilities with a focus on reducing life-cycle costs and improving resilience
- Economic Competitiveness – contributing to the economic competitiveness of the United States over the medium- to long-term and preserving jobs
- Quality of Life – increasing transportation choices and access to transportation services for individuals in communities across the United States
- Environmental Sustainability - Improving energy efficiency, reducing dependence on oil, reducing greenhouse gas emissions, addressing stormwater through natural means, avoiding and mitigating environmental impacts and otherwise benefitting the environment.
- Safety – improving the safety of U.S. transportation facilities and systems for all modes of transportation and users.

Secondary selection grants considered by the DOT include:

- Innovation – use of innovative strategies to pursue long-term outcomes outlined in the primary selection criteria. DOT will consider the extent of technology usage, including intelligent transportation systems, dynamic pricing, value capture, rail wayside or on-board energy recovery, smart cards, active traffic management or radio frequency identification.
- Partnership – demonstrating strong collaboration among a broad range of participants, integration of transportation with other public service efforts, and/or projects that are the product of a robust planning process.

Grant Amounts and Funding Match

TIGER Discretionary Grants may not be less than $10 million and not greater than $200 million. Applicants must be able to show that at least 20% of the project will be funded using non-grant funds. DOT will give priority to projects that use the TIGER Discretionary Grant funding to complete an overall financing package. Projects can increase their competitiveness for purposes of the grant by demonstrating significant non-federal financial contributions.

3.6 Supplemental Environmental Project Funds

Individuals or entities found to be in violation of State or Federal environmental laws and facing monetary damages payments or fines may opt to enter a settlement agreement that includes the implementation of a Supplemental Environmental Project (SEP). Supplemental Environmental Projects are environmentally beneficial projects that a violator voluntarily agrees to undertake in settlement of a civil penalty action.[11] The main goal of SEPs is to improve environmental health of communities that have been put at risk due to the violation of an environmental law

The guidelines governing SEPs on the state and federal level are similar, however there are distinctions. The following sections describe both federal and state SEP programs.

3.6.1 Federal

Federal policy requires that a nexus exist between the violation and the proposed SEP. For Federal projects, nexus exists only if a proposed project meets one of the following criteria:

- The project is designed to reduce the likelihood that similar violations will occur in the future
- The project reduces the adverse impact to public health or the environment to which the violation at issue contributes; or
- The project reduces the overall risk to public health or the environment potentially affected by the violation at issue.

Federal SEPs are prevented from containing projects that:

- Donate funds to third parties
- Call for EPA management of funds obtained through SEP
- Augment Congressional appropriations
- Satisfy EPA's statutory obligation to perform a particular activity; or
- Supplement projects for which a violator is already receiving federal financial assistance, that is, a federal loan, contract or grant.

3.6.2 State

The SWB or Regional Water Board may allow a discharger to satisfy part of the monetary assessment imposed in an administrative civil liability order by completing or funding one or more SEPs. As a general rule no SEPs should be authorized by the State or Regional Water Board in an amount that exceeds 50% of the total monetary assessment against the discharger.

There are two types of SEPs allowed by State law: (1) SEPs that are implemented by the discharger, and (2) those that are administered by a third-party using funds allocated by the discharger. Third-party entities that are paid to implement an SEP must be independent of the discharger as well as the Water Board.

SEPs approved by the Water Board must, at a minimum satisfy the following criteria:

- SEP can only consist of measures that go above and beyond what is otherwise required of the discharger.
- The SEP shall directly benefit or study groundwater or surface water quality or quantity, and the beneficial uses of waters of the State. Examples include:
    - Monitoring programs
    - Studies or investigations
    - Water or soil treatment

[11] The SEP should be a project that the violator will not otherwise be required to perform.

    - Habitat restoration or enhancement
    - Pollution prevention or reduction
    - Wetland, stream, or other waterbody protection, restoration or creation
    - Conservation easements
    - Stream augmentation
    - Reclamation
    - Watershed assessment
    - Watershed management facilitation services
    - Compliance training, compliance education, and the development of educational materials
    - Enforcement projects, such as training or environmental compliance and enforcement personnel, and
    - Non-point source program implementation
- A SEP shall not directly benefit a Water Board member or any of his or her family members.

The following additional criteria shall be evaluated by the Water Boards during final approval of the SEPS:

- Whether the project has documented support by other public agencies, public groups and affected persons
- Whether the SEP directly benefits the area where the harm occurred or provide a region-wide or state-wide benefit
- Whether the SEP project complies with the California Environmental Quality Act
- Whether the entity responsible for implanting the SEP has the stability to complete the project
- Whether the SEP proposal includes criteria for monitoring and tracking the long-term success of the project.

Eligible projects or proposal must also show that a nexus exists between the SEP and the violation. This means that there must be a relationship between the nature or location of the violation and the nature or location for the SEP. A nexus exists per se if the project remediates or reduces the probable overall environmental or public health impacts or risks to which the violation at issues contributes, or if the project is designed to reduce the likelihood that similar violations will occur in the future.

Project Selection

Each Regional Water Board has discretion in choosing SEP projects. Each Board may maintain a list of pre-approved SEPs and develop criteria for placement of environmental projects on its list of potential SEPs

4 Low Cost Financing

4.1 The Clean Water Sate Revolving Fund

The federal Clean Water Act established The Clean Water Sate Revolving Fund (CWSRF) to finance protection and improvement of water quality. The CWSRF program provides each state the opportunity to establish an environmental infrastructure bank capitalized by federal and state funds. Financing options include loans, refinancing debt, purchasing or guaranteeing local debt, and purchasing bond insurance.[12] Since 2009 federal CWSRF appropriations and California law have also authorized grants, negative interest rates, and principal forgiveness on a limited basis.

Through June 30, 2019, the estimated cumulative, uncommitted cash available for financing new projects is approximately $620 million. The program is capable of financing projects from less than a $1 million to more than $100 million.

The State Water Board maintains a Project List ("List") that reflects projects interested in CWSRF financing. A project must be on the List to receive financing, but the List does not guarantee financing or the order of financing. The List classifies each project application relative to the Water Board's water quality and sustainability priorities, and helps prioritize the Program staff's marketing and application review efforts.

The Department of Financial Assistance processes CWSRF applications and makes recommendations to the Executive Director. The Executive Director of the State Water Board generally updates the List quarterly. The Executive Director may update the list more frequently if necessary or less frequently if there are no new potential projects to be added during the quarter.

4.1.1 Priority Classes

As the Division of Financial Assistance ("Division") receives CWSRF applications it assigns to each project a priority. Each project is assigned to one of the following priority classes:

Class A- Public Health Problems

i. "Publicly Owned Treatment Works" projects or other required to alleviate public health problems where the county board of supervisors, City Council, or the County Health Officer has certified that a health problem exists, and where a State or Regional Water Board has (1) adopted a prohibition for elimination of discharges and such prohibition has been approved by the State Water Board, (2) approved a local moratorium prohibiting the construction of new systems, or (3) adopted a cease and desist order; or

ii. nonpoint source, storm water drainage pollution and estuary enhancement projects required to comply with prohibitions, postings, limitations, or warnings that have been imposed by responsible health authorities, and where the State or Regional Water Board has concurred with the findings of the health authority and has established a time schedule for correction or elimination of the threat to public health.

[12] Interest rates must be below market rate, but not less than zero percent. Repayment periods are up to 30 years or the expected useful life of the financed asset. California's CWSRF Program has funded a broad range of projects. About 76% of funds were used for wastewater treatment and water recycling facilities. About 20% of funds were used for wastewater collection systems. About four percent of funds were used for non-point source or estuary projects.

Class B – Pollution of Impaired Water Bodies

Projects to address impairments of CWA 303(d) listed water bodies.

Class C – Compliance with requirements or Water Recycling projects

i. Projects necessary to comply with WDRs or other regulatory requirements formally imposed by the State Water Board or Regional Water Board, or projects necessary for correction of threatened violations of existing or proposed WDRs; or

ii. Projects that provide for treatment and delivery of municipal wastewater or groundwater contaminated due to human activity, for uses that will offset or augment state and local water supplies or projects that are necessary to meet state policy regarding recycled water.\

Class D – Projects Serving as Preventative Measures Against Additional Water Quality Degradation for Impaired or Unimpaired Water Bodies

Project to control discharges to impaired or unimpaired waters, where correction of such discharges may, or may not, be required through formally adopted WDRs.

Class E – Other Projects

Project not included in any of the other priority classes

4.1.2 Sustainability

A project that supports or incorporates one or more of the following sustainability goals receives one priority point for each area addressed:

a. The project supports infill development or results in the reuse or redevelopment of land in an area presently served by transit, streets, water, sewer, and other essential services.

b. The applicant maintains a capital improvement plan, an asset management plan, or has performed a full-cost pricing analysis, or the project incorporates climate change adaptation

c. The project protects environmental or agricultural resources such as farm, range and forestlands; wetlands and wildlife habitats; recreational lands such as parks, trails, and greenbelts; or landscapes with locally unique features or areas identified by the state as deserving special protection.

d. The project is cited in one or more regional environmental management plans.

e. The project incorporates wastewater or storm water/urban runoff recycling, water conservation, energy conservation, low impact development, or reduced use of other vital resources

f. The project uses low-impact treatment for lower lifecycle operating costs through reduced energy, chemical, or other inputs.

4.1.3 Funding for Projects

The Division will review projects on the Project List with complete applications, except as directed by the State Water Board, based on the project class, A being the highest class and E being the lowest class, and the number of sustainability points. Projects within each project class will be ranked according to their sustainability points. If the State Water Board lacks sufficient funds to fund all projects with complete applications, then the Division will first fund projects based on the classes established above, giving priority with the class to the Small DAC with the lowest median household income, and then to the project that most effectively addresses sustainability and global climate change.

4.2 The California Infrastructure Development Bank – Infrastructure State Revolving Fund Program

The California Infrastructure and Economic Development Bank ("I-Bank") was created to provide an accessible low-cost financing option to eligible borrowers for a wide range of infrastructure projects. To meet this purpose the I-bank developed its Infrastructure State Revolving Fund ("ISRF Program"). ISRF program funding is available in amounts from $50,000 to $25 million, with terms up to 30 years.

4.2.1 Eligibility Criteria

Eligible costs for ISRF program financing include:

- All or any part of the cost of construction, renovation, and acquisition of all lands, structures, real or personal property.
- Rights, rights of way, franchises, licenses, easements, and interests acquired or used for a project
- The cost of demolishing or removing any buildings or structures on land so acquired, including the cost of acquiring any lands to which the buildings or structures may be moved
- The cost of all machinery, equipment, and financing charges
- Interest prior to during, and for a period after, completion of construction, renovation, or acquisition, as determined by the I-Bank
- Provisions for working capital
- Provisions for working capital
- Reserves for principal and interest and for extensions, enlargements, additions, replacement, renovations and improvements.
- The cost of architectural, engineering, financial and legal services, plans, specifications, estimates, administrative expenses
- Other expenses necessary or incidental to determining the feasibility of any project or incidental to the construction, acquisition, or financing of any project.

ISRF program applicants must meet readiness and feasibility standards to be eligible to participate in the loan program. Applicants must demonstrate that construction of their project will be complete[13] within 2 years of receiving I-Bank loan approval. Applicants must also meet the following feasibility standards:

- Permits – Applicant must provide evidence that it has procured or is in the process of procuring all applicable permits or approvals necessary for construction of the project.
- Source of Loan Repayment – Applicant must demonstrate that it has identified an eligible source of repayment. Eligible sources of payment include:

[13] The portion of the project financed by the I-Bank must meet construction contract specifications for completeness and/ or ability to operate.

    - Water or sewer enterprise/special funds
    - Other enterprise/special funds
    - General fund lease
    - Land secured
    - Voter-approved general fund debt or other voter approved debt secured by full faith and credit (general obligation)
    - Other sources of repayment and/or alternative financing structures may be considered by the I-bank at its discretion
- Project funds – I-Bank requires that all project funding sources, other than I-Bank loan funds, to be identified at the time of application and committed prior to loan approval.
- Prevailing wages and Contractor Pre-Qualification

Eligible Project Types

The ISRF program funds both infrastructure projects as well as economic expansion programs. The ISRF program has enumerated sixteen distinct project types that may be funded as an infrastructure project. These project types include the following:

- City Streets – any street, avenue, boulevard, road, parkway, drive, or other way that is an existing or planned roadway and may comprise pavement, bridges, shoulders, gutter, curbs, guardrails, sidewalks, parking areas, benches fountains, plantings, lighting systems, and other areas within the street lines
- Drainage, water supply, and flood control – including but not limited to ditches, canals, levees, pumps, dams, conduits, pipes, storm sewers, and dikes as well as the acquisition, improvement, maintenance, and management of flood plain areas

Selection Criteria

If immediate financing needs of projects to be selected for I-Bank financing exceed the lending capacity of the ISRF Program, I-Bank will give priority to Infrastructure Projects over Economic Expansion Projects. If further prioritization is required, the I-Bank will give priority to Infrastructure projects located in, or adjacent to or directly affecting, areas with high unemployment rates, low median family income, declining or slow growth in labor force employment or high poverty rates.

5 Conclusion

The regional projects and the green street conversion projects identified by the DCWMGA are well positioned to receive grant funding or loan assistance from the sources identified in this memorandum. Members of the DCWMGA should be able to fund a portion of the projects identified in the EWMP through existing funding sources. However, with competition from the other WMGA projects and increasing need for water infrastructure funding throughout the state the DCWMGA will need to look to other sources of funding to complete the funding mix for implementing the EWMP.

Attachment W

Statement of Inclusion from each Permittee

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January 22, 2015

Mr. Sam Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention Mr. Ivar Ridgeway

Dear Mr. Unger:

CERTIFICATION BY LEGAL COUNSEL FOR THE CITY OF LOS ANGELES CONFIRMING LEGAL AUTHORITY TO IMPLEMENT THE PROVISIONS OF THE MUNICIPAL STORMWATER PERMIT

I write pursuant to Part VI(A)(2)(b) of Order No. R4-2012-0175,otherwise known as the Municipal Separate Stormwater Sewer System (MS4) Permit (the "Order"). Part VI(A)(2)(b) of the Permit provides:

> *"Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d) (2) (i) (AF) and this Order."*

The Office of the City Attorney of the City of Los Angeles (City), serving as its legal counsel, certifies that the City has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and of the Order. This correspondence addresses all legal authority requirements as listed in the Order. Subsequently, annual certification by our office will be included in the Stormwater Annual Report as required by the Order.

Order Part VI(A)(2)(b)(i) - "Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR §122.26(d) (2) (i) (A-F) and this Order"

Below is a list of applicable Los Angeles Municipal Code (LAMC) provisions that provide the requisite legal authorities:

LAMC 64.70 General Provisions.
LAMC 64.70.01 Definitions and Abbreviations.
LAMC 64.70.02 Pollutant Discharge Control.
LAMC 64.70.03 Elimination of Illicit Discharges and Illicit Connections.
LAMC 64.70.05 Authority to Inspect.
LAMC 64.70.06 Authority to Arrest and Issue Citations.
LAMC 64.70.07 Enforcement.
LAMC 64.70.08 Remedies Not Exclusive.
LAMC 64.70.09 Liability for Costs of Correction Arising from Unlawful Discharge.
LAMC 64.70.10 Disposition of Money Collected.
LAMC 64.70.11 Stormwater and Urban Runoff Pollution Education.
LAMC 64.70.12 Construction and Application.
LAMC 64.70.13 Severability.
LAMC 64.72 Stormwater Pollution Control Measures for Development Planning and Construction Activities.
LAMC 64.72.01 Authority of the Board of Public Works.
LAMC 64.72.02 Funds Collected from Waiver.
LAMC 64.72.03 Supplemental Provisions.
LAMC 64.72.04 Authority to Inspect and Enforce Stormwater Pollution Control Measures.
LAMC 64.72.05 LID Plan Check Fees.

In addition, statewide regulations provide further legal authorities with respect to intergovernmental authorities, specifically:

California Government Code §6502
California Government Code §23004

Relationship of Applicable Ordinances and Other Legal Authorities to the Requirements of 40CFR §122.26(d)(2)(i)(a-F) and the Order

The table below indicates the basic relationship between the "Legal Authority" requirements listed in Section VI(A)(2)(b) of the Order and the existing legal statutes that provide this legal authority.

Legal Authority Required by Permit	City/State Legal Provisions
VI.A.2.i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.	LAMC 64.70.02.B LAMC 64.70.02.C.1.a LAMC 64.70.02.D LAMC 64.70.03.A
ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A	LAMC 64.70.03.A
iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4	LAMC 64.70.03.A LAMC 64.70.03.B
iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4	LAMC 64.70.03.A
v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows)	LAMC 64.70.03.A LAMC 64.70.07
vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders	LAMC 64.70.05.B.4 LAMC 64.70.05.B.6
vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees	California Government Code §6502 California Government Code §23004
viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation	California Government Code §6502 California Government Code §23004

ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4	LAMC 64.70.05.A LAMC 64.70.05.B LAMC 64.72.04.B
x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations	LAMC 64.70.02.D
xi. Require that structural BMPs are properly operated and maintained	LAMC 64.70.02.D
xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4	LAMC 64.70.05.B.3
VI.A.b.ii. Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.	The local administrative and legal procedures available to mandate compliance with the above LAMC provisions are specified in the provisions themselves with key enforcement provisions being LAMC 64.70.06 and LAMC 64.70.07

The City is in the process of updating the LAMC with respect to its stormwater regulations. These changes will be reported with the 2014-2015 annual report.

Very truly yours,

JOHN CARVALHO, Deputy City Attorney
City's Attorney Office

WPDCR9163

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

BUREAU OF SANITATION

ENRIQUE C. ZALDIVAR
DIRECTOR

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January 22, 2015

Mr. Sam Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention Mr. Ivar Ridgeway

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> *"Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d) (2) (i) (AF) and this Order."*

The Office of the City Attorney of the City of Los Angeles (City), serving as its legal counsel, certifies that the City has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and of the Order. This correspondence addresses all legal authority requirements as listed in the Order. Subsequently, annual certification by our office will be included in the Stormwater Annual Report as required by the Order.

Order Part VI(A)(2)(b)(i) - "Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR §122.26(d) (2) (i) (A-F) and this Order"

Below is a list of applicable Los Angeles Municipal Code (LAMC) provisions that provide the requisite legal authorities:

LAMC 64.70 General Provisions.
LAMC 64.70.01 Definitions and Abbreviations.
LAMC 64.70.02 Pollutant Discharge Control.
LAMC 64.70.03 Elimination of Illicit Discharges and Illicit Connections.
LAMC 64.70.05 Authority to Inspect.
LAMC 64.70.06 Authority to Arrest and Issue Citations.
LAMC 64.70.07 Enforcement.
LAMC 64.70.08 Remedies Not Exclusive.
LAMC 64.70.09 Liability for Costs of Correction Arising from Unlawful Discharge.
LAMC 64.70.10 Disposition of Money Collected.
LAMC 64.70.11 Stormwater and Urban Runoff Pollution Education.
LAMC 64.70.12 Construction and Application.
LAMC 64.70.13 Severability.
LAMC 64.72 Stormwater Pollution Control Measures for Development Planning and Construction Activities.
LAMC 64.72.01 Authority of the Board of Public Works.
LAMC 64.72.02 Funds Collected from Waiver.
LAMC 64.72.03 Supplemental Provisions.
LAMC 64.72.04 Authority to Inspect and Enforce Stormwater Pollution Control Measures.
LAMC 64.72.05 LID Plan Check Fees.

In addition, statewide regulations provide further legal authorities with respect to intergovernmental authorities, specifically:

California Government Code §6502
California Government Code §23004

Relationship of Applicable Ordinances and Other Legal Authorities to the Requirements of 40CFR §122.26(d)(2)(i)(a-F) and the Order

The table below indicates the basic relationship between the "Legal Authority" requirements listed in Section VI(A)(2)(b) of the Order and the existing legal statutes that provide this legal authority.

Legal Authority Required by Permit	City/State Legal Provisions
VI.A.2.i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.	LAMC 64.70.02.B LAMC 64.70.02.C.1.a LAMC 64.70.02.D LAMC 64.70.03.A
ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A	LAMC 64.70.03.A
iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4	LAMC 64.70.03.A LAMC 64.70.03.B
iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4	LAMC 64.70.03.A
v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows)	LAMC 64.70.03.A LAMC 64.70.07
vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders	LAMC 64.70.05.B.4 LAMC 64.70.05.B.6
vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees	California Government Code §6502 California Government Code §23004
viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation	California Government Code §6502 California Government Code §23004

ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4	LAMC 64.70.05.A LAMC 64.70.05.B LAMC 64.72.04.B
x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations	LAMC 64.70.02.D
xi. Require that structural BMPs are properly operated and maintained	LAMC 64.70.02.D
xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4	LAMC 64.70.05.B.3
VI.A.b.ii. Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.	The local administrative and legal procedures available to mandate compliance with the above LAMC provisions are specified in the provisions themselves with key enforcement provisions being LAMC 64.70.06 and LAMC 64.70.07

The City is in the process of updating the LAMC with respect to its stormwater regulations. These changes will be reported with the 2014-2015 annual report.

Very truly yours,

JOHN CARVALHO, Deputy City Attorney
City's Attorney Office

WPDCR9163

COUNTY OF LOS ANGELES
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December 16, 2013

Mr. Samuel Unger, P.E., Executive Officer
California Regional Water Quality Control Board – Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-2343

Attention: Mr. Ivar Ridgeway

Re: Certification By Legal Counsel For County of Los Angeles' Annual Report

Dear Mr. Unger:

Pursuant to the requirements of Part VI(A)(2)(b) of Order No. R4-2012-0175 (the "Order"), the Office of the County Counsel of the County of Los Angeles makes the following certification in support of the Annual Report of the County of Los Angeles ("County"):

<u>Certification Pursuant To Order Part VI(A)(2)(b)</u>

"*Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and this Order.*"

The County has the legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order.

<u>Order Part VI(A)(2)(b)(i)</u>

"*Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR §122.26(d)(2)(i)(A-F) and this Order*"

Citations Of Applicable Ordinances Or Other Legal Authorities

Although many portions of State law, the Charter of the County of Los Angeles and the Los Angeles County Code are potentially applicable to the implementation and enforcement of these requirements, the primary applicable laws and ordinances are as follows:

Los Angeles County Code, Title 12, Chapter 12.80 STORMWATER AND RUNOFF POLLUTION CONTROL, including:

§12.80.010 - §12.80.360 Definitions

§12.80.370 Short title.

§12.80.380 Purpose and intent.

§12.80.390 Applicability of this chapter.

§12.80.400 Standards, guidelines and criteria.

§12.80.410 Illicit discharges prohibited.

§12.80.420 Installation or use of illicit connections prohibited.

§12.80.430 Removal of illicit connection from the storm drain system.

§12.80.440 Littering and other discharge of polluting or damaging substances prohibited.

§12.80.450 Stormwater and runoff pollution mitigation for construction activity.

§12.80.460 Prohibited discharges from industrial or commercial activity.

§12.80.470 Industrial/commercial facility sources required to obtain a NPDES permit.

§12.80.480 Public facility sources required to obtain a NPDES permit.

§12.80.490 Notification of uncontrolled discharges required.

§12.80.500 Good housekeeping provisions.

§12.80.510 Best management practices for construction activity.

§12.80.520 Best management practices for industrial and commercial facilities.

§12.80.530 Installation of structural BMPs.

§12.80.540 BMPs to be consistent with environmental goals.

§12.80.550 Enforcement—Director's powers and duties.

§12.80.560 Identification for inspectors and maintenance personnel.

§12.80.570 Obstructing access to facilities prohibited.

§12.80.580 Inspection to ascertain compliance—Access required.

§12.80.590 Interference with inspector prohibited.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.80.650 Conflicts with other code sections.

§12.80.660 Severability.

§12.80.700 Purpose.

§12.80.710 Applicability.

§12.80.720 Registration required.

§12.80.730 Exempt facilities.

§12.80.740 Certificate of inspection—Issuance by the director.

§12.80.750 Certificate of inspection—Suspension or revocation.

§12.80.760 Certificate of inspection—Termination.

§12.80.770 Service fees.

§12.80.780 Fee schedule.

§12.80.790 Credit for overlapping inspection programs.

§12.80.800 Annual review of fees.

Los Angeles County Code, Title 12, Chapter 12.84 LOW IMPACT DEVELOPMENT STANDARDS, including:

§12.84.410 Purpose.

§12.84.420 Definitions.

§12.84.430 Applicability.

§12.84.440 Low Impact Development Standards.

§12.84.445 Hydromodification Control.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Los Angeles County Code, Title 22 PLANNING AND ZONING, Part 6 ENFORCEMENT PROCEDURES, including:

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

Los Angeles County Code, Title 26 BUILDING CODE, including:

§26.103 Violations And Penalties

§26.104 Organization And Enforcement

§26.105 Appeals Boards

§26.106 Permits

§26.107 Fees

§26.108 Inspections

California Government Code §6502

California Government Code §23004

Relationship Of Applicable Ordinances Or Other Legal Authorities To The Requirements of 40 CFR §122.26(d)(2)(i)(A-F) And The Order

Although, depending upon the particular issue, there may be multiple ways in which particular sections of the County's ordinances and State law relate to the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order, the table below indicates the basic relationship with Part VI(A)(2)(a) of the Order:

Order Part VI(A)(2)(a) Items	**Primary Applicable Ordinance/Statute**
i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.	§12.80.410 [illicit discharge prohibited]; §12.80.450 [construction] §12.80.460 [industrial and commercial] §12.80.470 and .480 [industrial and commercial NPDES requirements] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties] §26.104 [enforcement] §26.106 [permits] §26.108 [inspections]
ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.	§12.80.410 [illicit discharge prohibited]
iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4.	§12.80.410 [illicit discharge prohibited]; §12.80.420 [illicit connections prohibited]
iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.	§12.80.410 [illicit discharge prohibited]; §12.80.440 [littering and other polluting prohibited]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows).	§12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.620 [nuisance abatement] §12.80.635 [violation penalty] §12.80.640 [penalties not exclusive] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties] §26.104 [enforcement] §26.106 [permits] §26.108 [inspections]
vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.	Same as item v., above

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees.	California Government Code §6502 and §23004
viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation.	California Government Code §6502 and §23004
ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4.	§12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.80.620 [nuisance abatement] §12.80.635 [violation penalty] §12.80.640 [penalties not exclusive] §22.60.380 [enforcement.] §26.106 [permits] §26.108 [inspections]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations.	§12.80.450 [construction mitigation] §12.80.500 [good housekeeping practices] §12.80.510 [construction BMPs] §12.80.520 [industrial/commercial BMPs] §12.84.440 [LID standards] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections]
xi. Require that structural BMPs are properly operated and maintained.	§12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections]
xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.	§12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections]

Order Part VI(A)(2)(b)(ii)

"*Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.*"

The local administrative and legal procedures available to mandate compliance with the above ordinances are specified in those ordinances, particularly in:

§12.80.550 Enforcement—Director's powers and duties.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Title 26, §103 Violations And Penalties

Title 26, §104 Organization And Enforcement

Title 26, §105 Appeals Boards

Title 26, §106 Permits

Title 22 PLANNING AND ZONING, Part 6 ENFORCEMENT PROCEDURES, including:

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

The County attempts to first resolve each enforcement action administratively. However, the above cited ordinances also provide the County with the authority to pursue such actions in the judicial system as necessary.

Very truly yours,

JOHN F. KRATTLI
County Counsel

By Judith A. Fries
JUDITH A. FRIES
Principal Deputy County Counsel
Public Works Division

JAF:jyj

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JOHN F. KRATTLI
County Counsel

December 16, 2013

Mr. Samuel Unger, P.E., Executive Officer
California Regional Water Quality Control Board – Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-2343

Attention: Mr. Ivar Ridgeway

Re: Certification By Legal Counsel For Los Angeles County Flood Control District's Annual Report

Dear Mr. Unger:

Pursuant to the requirements of Part VI(A)(2)(b) of Order No. R4-2012-0175 (the "Order"), the Office of the County Counsel of the County of Los Angeles makes the following certification in support of the Annual Report of the Los Angeles County Flood Control District ("LACFCD"):

<u>Certification Pursuant To Order Part VI(A)(2)(b)</u>

"*Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and this Order.*"

LACFCD has the legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order.

<u>Order Part VI(A)(2)(b)(i)</u>

"*Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR §122.26(d)(2)(i)(A-F) and this Order*"

Citations Of Applicable Ordinances Or Other Legal Authorities

Although many portions of State law, the Charter of the County of Los Angeles, the Los Angeles County Code and LACFCD's Flood Control District Code ("Code") are potentially applicable to the implementation and enforcement of these requirements, the primary applicable laws and ordinances are as follows:

Los Angeles County Code, Title 12, Chapter 12.80 STORMWATER AND RUNOFF POLLUTION CONTROL, including:

§12.80.010 - §12.80.360 Definitions

§12.80.370 Short title.

§12.80.380 Purpose and intent.

§12.80.390 Applicability of this chapter.

§12.80.400 Standards, guidelines and criteria.

§12.80.410 Illicit discharges prohibited.

§12.80.420 Installation or use of illicit connections prohibited.

§12.80.430 Removal of illicit connection from the storm drain system.

§12.80.440 Littering and other discharge of polluting or damaging substances prohibited.

§12.80.450 Stormwater and runoff pollution mitigation for construction activity.

§12.80.460 Prohibited discharges from industrial or commercial activity.

§12.80.470 Industrial/commercial facility sources required to obtain a NPDES permit.

§12.80.480 Public facility sources required to obtain a NPDES permit.

§12.80.490 Notification of uncontrolled discharges required.

§12.80.500 Good housekeeping provisions.

§12.80.510 Best management practices for construction activity.

§12.80.520 Best management practices for industrial and commercial facilities.

§12.80.530 Installation of structural BMPs.

§12.80.540 BMPs to be consistent with environmental goals.

§12.80.550 Enforcement—Director's powers and duties.

§12.80.560 Identification for inspectors and maintenance personnel.

§12.80.570 Obstructing access to facilities prohibited.

§12.80.580 Inspection to ascertain compliance—Access required.

§12.80.590 Interference with inspector prohibited.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.80.650 Conflicts with other code sections.

§12.80.660 Severability.

§12.80.700 Purpose.

§12.80.710 Applicability.

§12.80.720 Registration required.

§12.80.730 Exempt facilities.

§12.80.740 Certificate of inspection—Issuance by the director.

§12.80.750 Certificate of inspection—Suspension or revocation.

§12.80.760 Certificate of inspection—Termination.

§12.80.770 Service fees.

§12.80.780 Fee schedule.

§12.80.790 Credit for overlapping inspection programs.

§12.80.800 Annual review of fees.

Los Angeles County Code, Title 12, Chapter 12.84 LOW IMPACT DEVELOPMENT STANDARDS, including:

§12.84.410 Purpose.

§12.84.420 Definitions.

§12.84.430 Applicability.

§12.84.440 Low Impact Development Standards.

§12.84.445 Hydromodification Control.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Los Angeles County Code, Title 22 PLANNING AND ZONING, Part 6 ENFORCEMENT PROCEDURES, including:

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

Los Angeles County Code, Title 26 BUILDING CODE, including:

§26.103 Violations And Penalties

§26.104 Organization And Enforcement

§26.105 Appeals Boards

§26.106 Permits

§26.107 Fees

§26.108 Inspections

LACFCD Code Chapter 21 - STORMWATER AND RUNOFF POLLUTION CONTROL including:

§21.01 Purpose and Intent

§21.03 Definitions

§21.05 Standards, Guidelines, and Criteria

§21.07 Prohibited Discharges

§21.09 Installation or Use of Illicit Connections Prohibited

§21.11 Littering Prohibited

§21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity

§21.15 Notification of Uncontrolled Discharges Required

§21.17 Requirement to Monitor and Analyze

§21.19 Conflicts With Other Code Sections

§21.21 Severability

§21.23 Violation a Public Nuisance

California Government Code §6502

California Government Code §23004

California Water Code §8100 *et. seq.*

Relationship Of Applicable Ordinances Or Other Legal Authorities To The Requirements of 40 CFR §122.26(d)(2)(i)(A-F) And The Order

Although, depending upon the particular issue, there may be multiple ways in which particular sections of the County of Los Angeles' ordinances, LACFCD's ordinances, and statutes relate to the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order, the table below indicates the basic relationship with Part VI(A)(2)(a) of the Order:

Order Part VI(A)(2)(a) Items	**Primary Applicable Ordinance/Statute**
i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited]; §12.80.450 [construction] §12.80.460 [industrial and commercial] §12.80.470 and .480 [industrial and commercial NPDES requirements] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§26.104 [enforcement] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited] LACFCD Code: §21.07 Prohibited Discharges
iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited]; §12.80.420 [illicit connections prohibited] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.23 Violation a Public Nuisance

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited]; §12.80.440 [littering and other polluting prohibited] LACFCD Code: §19.07 Interference With or Placing Obstructions, Refuse, Contaminating Substances, or Invasive Species in Facilities Prohibited §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows).	Los Angeles County Code: §12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.620 [nuisance abatement] §12.80.635 [violation penalty]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§12.80.640 [penalties not exclusive] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties] §26.104 [enforcement] §26.106 [permits] §26.108 [inspections] LACFCD Code: §19.11 Violation a Public Nuisance §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§21.19 Conflicts With Other Code Sections §21.23 Violation a Public Nuisance
vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.	Same as item v., above
vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees.	California Government Code §6502 California Government Code §23004
viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation.	California Government Code §6502 California Government Code §23004
ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4.	Los Angeles County Code: §12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.80.620 [nuisance abatement] §12.80.635 [violation penalty] §12.80.640 [penalties not exclusive] §22.60.380 [enforcement.] §26.106 [permits] §26.108 [inspections]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations.	Los Angeles County Code: §12.80.450 [construction mitigation] §12.80.500 [good housekeeping practices] §12.80.510 [construction BMPs] §12.80.520 [industrial/commercial BMPs] §12.84.440 [LID standards] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
xi. Require that structural BMPs are properly operated and maintained.	Los Angeles County Code: §12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§21.23 Violation a Public Nuisance
xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.	Los Angeles County Code: §12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance

Order Part VI(A)(2)(b)(ii)

"*Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.*"

The local administrative and legal procedures available to mandate compliance with the above ordinances are specified in those ordinances, particularly in:

Los Angeles County Code:

§12.80.550 Enforcement—Director's powers and duties.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Title 26, §103 Violations And Penalties

Title 26, §104 Organization And Enforcement

Title 26, §105 Appeals Boards

Title 26, §106 Permits

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

LACFCD Code:

§21.05 Standards, Guidelines, and Criteria

§21.07 Prohibited Discharges

§21.09 Installation or Use of Illicit Connections Prohibited

§21.11 Littering Prohibited

§21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity

§21.15 Notification of Uncontrolled Discharges Required

§21.17 Requirement to Monitor and Analyze

§21.23 Violation a Public Nuisance

LACFCD attempts to first resolve each enforcement action administratively. However, the above cited ordinances also provide LACFCD with the authority to pursue such actions in the judicial system as necessary.

Very truly yours,

JOHN F. KRATTLI
County Counsel

By Judith Fries
JUDITH A. FRIES
Principal Deputy County Counsel
Public Works Division

JAF:jyj

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CITY OF HAWTHORNE

4455 West 126th Street • Hawthorne, California 90250-4482

Department of Public Works, Engineering Division
Office (310) 349-2980 Fax (310) 978-9862

Mr. Sam Unger, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

December 1, 2014

RE: Legal Authority Certification for the City of Hawthorne

The City, by and through its legal counsel, hereby submits the following certification, pursuant to Part VI.A.2 of Order No. R4-2012-0175, issued by the Regional Water Quality Control Board – Los Angeles Region ("RWQCB"), adopted on December 28, 2012 and entitled "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)" [NPDES No. CAS004001] (the "2012 NPDES Permit"). Part VI.A.2 of the 2012 NPDES Permit requires the City, as a Permittee, to submit a new or updated statement by its legal counsel that the Permittee has obtained all necessary legal authority to comply with the Permit.

The City, as a general law city, has broad general police powers under the Constitution of the State of California to enact legislation for health and public welfare of the community to the extent not preempted by federal or state law. In addition to the provisions of the municipal Code, which provide various enforcement and nuisance abatement powers, the City has adopted specific stormwater ordinances for the purpose of ensuring that it has adequate legal authority to implement and enforce its stormwater control program and to implement the programs prescribed by the 2012 and preceding NPDES Permits. The City has the authority under the Constitution and statutes of the State of California to enact and enforce these ordinances, and these ordinances were duly enacted. These ordinances contain specific enforcement provisions under the generally applicable enforcement provisions of the Municipal Code.

Based on its prior adoption of comprehensive stormwater ordinances, which have been and continue to be amended as and when required by applicable NPDES permits and RWQCB orders, as well as other parts of its Municipal Code, the City previously submitted statements to the RWQCB confirming that it has all necessary legal authority to control discharges to and from those portions of the Municipal Separate Storm Sewer System (MS4) over which the City has jurisdiction through adoption of ordinances and/or municipal code modifications, regulations and other legal documents. The purpose of this letter is to provide the RWQCB with an updated statement confirming the City's compliance with Part VI.A.2 of the 2012 NPDES Permit.

In our opinion, as of the date of this letter, the City has adequate legal authority, as envisioned by the 2012 NPDES Permit, the Clean Water Act and applicable regulations promulgated thereunder, specifically, 40 CFR 22.26(d)(2)(i)(A-F), to implement the requirements of the 2012 NPDES Permit by the mandated dates, and to enforce such additional requirements after they have been implemented, consistent with the requirements set forth in the U.S. Environmental Protection Agency's regulations and to the extent permitted by State and Federal law, subject to the limitations on municipal action under the California and United States Constitutions, and that the City has obtained the necessary legal authority to control and prohibit discharges of pollutants into the Municipal Separate Storm Sewer System, as required by the 2012 NPDES Permit.

Should you have any questions regarding the City's legal authority, please feel free to call me at 310-349-2960 or E-Mail me at rmiyahira@cityofhawthorne.org.

Sincerely,

Russell Miyahira

Russell Miyahira
City Attorney

cc: Arnold Shadbehr, P.E.
John L. Hunter & Associates

City of El Segundo

November 18, 2014

Mr. Sam Unger, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

RE: Legal Authority Certification for the City of El Segundo to Implement and Enforce the Requirements of LARWQCB Order R4-2012-0175

Dear Mr. Unger:

The City of El Segundo submits this statement in its capacity as a co-permittee under LARWQCB Order R4-2012-0175 (NPDES No. CAS004001) (the “MS4 Permit”), in accordance with Part VI.A.2 of the MS4 Permit.

I am the City Attorney of the City of El Segundo, California. In that capacity, I state that it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit, consistent with the requirements set forth in the regulations implementing the Clean Water Act (40 CFR § 122.26(d)(2)(i)(A-F)), and to the extent permitted by state and federal law and subject to the limitations on municipal action under the California and United States Constitutions.

The primary source of the City’s authority is Article 11, § 7 of the California Constitution. The City also has authority under California Water Code § 13002 to adopt and enforce regulations conditioning, restricting and limiting activities which might degrade the quality of waters of the State. In accordance with these laws, the City adopted El Segundo Municipal Code (“ESMC”) Chapters 5-4 and 5-7 which include the City’s regulations enabling it to implement the MS4 Permit. As the City transitions to the new EWMP requirements, these regulations may be amended to implement the new programs. Nevertheless, the City has already the legal authority as required under Part VI.A.2 of the MS4 Permit.

350 Main Street, El Segundo, California 90245-3813
Phone (310)524-2304 Fax (310) 322-7137

California law also authorizes the City to require the use of control measures to prevent or reduce the discharge of pollutants and ensure that such control measures are properly operated and maintained. The City's regulatory authority is supplemented by the California Environmental Quality Act ("CEQA") process by allowing the City to impose enforceable mitigation measures on development projects. As a general law city and municipal corporation, the City may enter into contracts that enable it to carry out its necessary functions including, without limitation, the ability to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

Pursuant to ESMC Chapters 1-2, 1-2A, and § 5-4-11, the City's regulations may be enforced administratively, civilly and criminally. The ESMC also provides various procedures to modify and/or revoke city-issued permits for unlawful and/or environmentally disruptive activity.

Consequently, it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit. Please do not hesitate to contact me should you have any questions or need any additional information

Very truly yours,
Mark D. Hensley, City Attorney

By: ______________________
Karl H. Berger,
Assistant City Attorney

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A LAW PARTNERSHIP

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WRITER'S EMAIL ADDRESS:
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December 8, 2014

Mr. Sam Unger, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

RE: Legal Authority Certification for the City of Lomita to Implement and Enforce the Requirements of LARWQCB Order R4-2012-0175

Dear Mr. Unger:

The City of Lomita submits this statement in its capacity as a co-permittee under LARWQCB Order R4-2012-0175 (NPDES No. CAS004001) (the "MS4 Permit"), in accordance with Part VI.A.2 of the Order.

I am the City Attorney of the City of Lomita, California. In that capacity, I state that it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit, consistent with the requirements set forth in the regulations implementing the Clean Water Act, 40 CFR § 122.26(d)(2)(i)(A-F), and to the extent permitted by state and federal law and subject to the limitations on municipal action under the California and United States Constitutions.

The primary source of the City's authority is Article 11, § 7 of the California Constitution. The City also has authority under § 13002 of the California Water Code to adopt and enforce ordinances conditioning, restricting and limiting activities which might degrade the quality of waters of the State. Pursuant to Article 11, § 7 of the California Constitution and § 13002 of the California Water Code, the City adopted Chapters 5-8 and 5-9 of the Lomita Municipal Code ("LMC"), which contains the City's regulations enabling it to impose the legal requirements of the MS4 Permit (see attached analysis of legal authority). Thus, the City has the legal authority as required under Part VI.A.2 of the MS4 Permit.

Article 11, § 7 also provides the City the authority to require the use of control measures to prevent or reduce the discharge of pollutants and ensure that such control measures are properly operated and maintained. The City's environmental requirements are also implemented in part through the application of the California Environmental Quality Act ("CEQA") process to proposed projects, as enforceable mitigation measures. The City, as a municipal corporation, has authority to enter into contracts that enable it to carry out its necessary functions, including the power to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

Pursuant to LMC Chapters 1-2 Penalty Provisions, 5-8 Stormwater and Runoff Pollution Control Storm Drains and 5-9 Standard Urban Stormwater Mitigation Plan Implementation, the City's regulations may be enforced administratively through a notice to correct violations, civilly as a public nuisance and criminally. The LMC also provides various procedures to modify and/or revoke city-issued permits for unlawful and/or environmentally disruptive activity.

Consequently, it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit. Please do not hesitate to contact me should you have any questions or need any additional information

Very truly yours,

Christi Hogin
City Attorney

Enclosure

Lomita Statement of Legal Authority

A. The following list shows the relationship of the Lomita Municipal Code[1] and other legal authorities to the MS4 permit requirements under Part VI.A.2 of the Permit:

i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC Chapter 5-9 Standard Urban Stormwater Mitigation Plan Implementation; LCC 12.80.450 Stormwater and Runoff Pollution Mitigation for Construction Activity; LCC 12.80.460 Prohibited Discharges from Industrial and Commercial Activity; LCC 12.80.470 Industrial/Commercial Facility Sources Required to Obtain NPDES Permit

ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LCC 12.80.410 Illicit Discharges Prohibited

iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LCC 12.80.410 Illicit Discharges Prohibited; LCC 12.80.420 Installation or Use of Illicit Connection to Stormdrain Prohibited; LCC 12.80.430 Removal of Illicit Connection from Stormdrain System

iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LCC 12.80.440 Littering and Other Discharge of

[1] LMC 5-8-02 adopts by reference Chapter 12.80 of Title 12 of the Los Angeles County Code. All references to LCC are from this Chapter 12.80.

Polluting or Damaging Substances Prohibited

v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows).

LMC Chapter 1-2 Penalty Provisions; LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC Chapter 5-9 Standard Urban Stormwater Mitigation Plan Implementation; Part 4 of LCC Chapter 12.80 Runoff Management Requirements and Part 5 of LCC Chapter 12.80 Violations and Enforcement

vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.

LMC Chapter 1-2 Penalty Provisions; LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-200 Violations; Part 5 of LCC Chapter 12.80 Violations and Enforcement

vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees.

In addition to the provisions of LMC Chapter 5-8, which control the contribution of pollutants, the City, as a municipal corporation, has authority to enter into contracts that enable it to carry out its necessary functions, including the power to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation.

In addition to the provisions of LMC Chapter 5-8, which control the contribution of pollutants, the City, as a municipal corporation, has authority to enter into contracts that enable it to carry out its necessary functions, including the power to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-210 Inspections; LCC 12.80.580 Inspection to Ascertain Compliance—Access Required

x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations.

Article 11, § 7 of the California Constitution; California Public Resources Code § 21000 et seq. (CEQA); LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-06 Best Management Practices; Part 4 of LCC Chapter 12.80 Runoff Management Requirements; LMC Title 11 Zoning

xi. Require that structural BMPs are properly operated and maintained.

Article 11, § 7 of the California Constitution; California Public Resources Code § 21000 et seq. (CEQA); LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-060 Best Management Practices; LMC 5-9-110 Maintenance of Best Management Practices; LMC 5-9-120 Design Standards for Best Management Practices; Part 4 of LCC Chapter 12.80 Runoff Management Requirements; LMC Title 11 Zoning

xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.

California Public Resources Code § 21000 et seq. (CEQA); LMC Chapter 1-2 Penalty Provisions; LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-200 Violations; Part 5 of LCC Chapter 12.80 Violations and Enforcement

B. Procedures available to mandate compliance with applicable municipal ordinances under LMC Chapters 1-2 Penalty Provisions, 5-8 Stormwater and Runoff Pollution Control and 5-9 Standard Urban Stormwater Mitigation Plan Implementation and LCC Chapter 12.80:

1. Criminal Citation (judicial)

2. Administrative Notice of Violation (administrative)
3. Civil Nuisance Abatement (judicial)
4. Permit Revocation/Modification (administrative)
5. All other criminal and civil remedies available by law

COUNTY OF LOS ANGELES
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December 16, 2013

Mr. Samuel Unger, P.E., Executive Officer
California Regional Water Quality Control Board – Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-2343

Attention: Mr. Ivar Ridgeway

Re: Certification By Legal Counsel For County of Los Angeles' Annual Report

Dear Mr. Unger:

Pursuant to the requirements of Part VI(A)(2)(b) of Order No. R4-2012-0175 (the "Order"), the Office of the County Counsel of the County of Los Angeles makes the following certification in support of the Annual Report of the County of Los Angeles ("County"):

<u>Certification Pursuant To Order Part VI(A)(2)(b)</u>

"Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and this Order."

The County has the legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order.

<u>Order Part VI(A)(2)(b)(i)</u>

"Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR §122.26(d)(2)(i)(A-F) and this Order"

<u>Citations Of Applicable Ordinances Or Other Legal Authorities</u>

Although many portions of State law, the Charter of the County of Los Angeles and the Los Angeles County Code are potentially applicable to the implementation and enforcement of these requirements, the primary applicable laws and ordinances are as follows:

Los Angeles County Code, Title 12, Chapter 12.80 STORMWATER AND RUNOFF POLLUTION CONTROL, including:

§12.80.010 - §12.80.360 Definitions

§12.80.370 Short title.

§12.80.380 Purpose and intent.

§12.80.390 Applicability of this chapter.

§12.80.400 Standards, guidelines and criteria.

§12.80.410 Illicit discharges prohibited.

§12.80.420 Installation or use of illicit connections prohibited.

§12.80.430 Removal of illicit connection from the storm drain system.

§12.80.440 Littering and other discharge of polluting or damaging substances prohibited.

§12.80.450 Stormwater and runoff pollution mitigation for construction activity.

§12.80.460 Prohibited discharges from industrial or commercial activity.

§12.80.470 Industrial/commercial facility sources required to obtain a NPDES permit.

§12.80.480 Public facility sources required to obtain a NPDES permit.

§12.80.490 Notification of uncontrolled discharges required.

§12.80.500 Good housekeeping provisions.

§12.80.510 Best management practices for construction activity.

§12.80.520 Best management practices for industrial and commercial facilities.

§12.80.530 Installation of structural BMPs.

§12.80.540 BMPs to be consistent with environmental goals.

§12.80.550 Enforcement—Director's powers and duties.

§12.80.560 Identification for inspectors and maintenance personnel.

§12.80.570 Obstructing access to facilities prohibited.

§12.80.580 Inspection to ascertain compliance—Access required.

§12.80.590 Interference with inspector prohibited.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.80.650 Conflicts with other code sections.

§12.80.660 Severability.

§12.80.700 Purpose.

§12.80.710 Applicability.

§12.80.720 Registration required.

§12.80.730 Exempt facilities.

§12.80.740 Certificate of inspection—Issuance by the director.

§12.80.750 Certificate of inspection—Suspension or revocation.

§12.80.760 Certificate of inspection—Termination.

§12.80.770 Service fees.

§12.80.780 Fee schedule.

§12.80.790 Credit for overlapping inspection programs.

§12.80.800 Annual review of fees.

Los Angeles County Code, Title 12, Chapter 12.84 LOW IMPACT DEVELOPMENT STANDARDS, including:

§12.84.410 Purpose.

§12.84.420 Definitions.

§12.84.430 Applicability.

§12.84.440 Low Impact Development Standards.

§12.84.445 Hydromodification Control.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Los Angeles County Code, Title 22 PLANNING AND ZONING, Part 6 ENFORCEMENT PROCEDURES, including:

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

Los Angeles County Code, Title 26 BUILDING CODE, including:

§26.103 Violations And Penalties

§26.104 Organization And Enforcement

§26.105 Appeals Boards

§26.106 Permits

§26.107 Fees

§26.108 Inspections

California Government Code §6502

California Government Code §23004

Relationship Of Applicable Ordinances Or Other Legal Authorities To The Requirements of 40 CFR §122.26(d)(2)(i)(A-F) And The Order

Although, depending upon the particular issue, there may be multiple ways in which particular sections of the County's ordinances and State law relate to the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order, the table below indicates the basic relationship with Part VI(A)(2)(a) of the Order:

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.	§12.80.410 [illicit discharge prohibited]; §12.80.450 [construction] §12.80.460 [industrial and commercial] §12.80.470 and .480 [industrial and commercial NPDES requirements] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties] §26.104 [enforcement] §26.106 [permits] §26.108 [inspections]
ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.	§12.80.410 [illicit discharge prohibited]
iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4.	§12.80.410 [illicit discharge prohibited]; §12.80.420 [illicit connections prohibited]
iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.	§12.80.410 [illicit discharge prohibited]; §12.80.440 [littering and other polluting prohibited]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows).	§12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.620 [nuisance abatement] §12.80.635 [violation penalty] §12.80.640 [penalties not exclusive] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties] §26.104 [enforcement] §26.106 [permits] §26.108 [inspections]
vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.	Same as item v., above

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees.	California Government Code §6502 and §23004
viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation.	California Government Code §6502 and §23004
ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4.	§12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.80.620 [nuisance abatement] §12.80.635 [violation penalty] §12.80.640 [penalties not exclusive] §22.60.380 [enforcement.] §26.106 [permits] §26.108 [inspections]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations.	§12.80.450 [construction mitigation] §12.80.500 [good housekeeping practices] §12.80.510 [construction BMPs] §12.80.520 [industrial/commercial BMPs] §12.84.440 [LID standards] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections]
xi. Require that structural BMPs are properly operated and maintained.	§12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections]
xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.	§12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections]

Order Part VI(A)(2)(b)(ii)

"*Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.*"

The local administrative and legal procedures available to mandate compliance with the above ordinances are specified in those ordinances, particularly in:

§12.80.550 Enforcement—Director's powers and duties.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Title 26, §103 Violations And Penalties

Title 26, §104 Organization And Enforcement

Title 26, §105 Appeals Boards

Title 26, §106 Permits

Title 22 PLANNING AND ZONING, Part 6 ENFORCEMENT PROCEDURES, including:

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

The County attempts to first resolve each enforcement action administratively. However, the above cited ordinances also provide the County with the authority to pursue such actions in the judicial system as necessary.

Very truly yours,

JOHN F. KRATTLI
County Counsel

By Judith A. Fries
JUDITH A. FRIES
Principal Deputy County Counsel
Public Works Division

JAF:jyj

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COUNTY OF LOS ANGELES
OFFICE OF THE COUNTY COUNSEL
648 KENNETH HAHN HALL OF ADMINISTRATION
500 WEST TEMPLE STREET
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JOHN F. KRATTLI
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December 16, 2013

Mr. Samuel Unger, P.E., Executive Officer
California Regional Water Quality Control Board – Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-2343

Attention: Mr. Ivar Ridgeway

Re: Certification By Legal Counsel For Los Angeles County Flood Control District's Annual Report

Dear Mr. Unger:

Pursuant to the requirements of Part VI(A)(2)(b) of Order No. R4-2012-0175 (the "Order"), the Office of the County Counsel of the County of Los Angeles makes the following certification in support of the Annual Report of the Los Angeles County Flood Control District ("LACFCD"):

<u>Certification Pursuant To Order Part VI(A)(2)(b)</u>

"*Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and this Order.*"

LACFCD has the legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order.

<u>Order Part VI(A)(2)(b)(i)</u>

"*Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR §122.26(d)(2)(i)(A-F) and this Order*"

Citations Of Applicable Ordinances Or Other Legal Authorities

Although many portions of State law, the Charter of the County of Los Angeles, the Los Angeles County Code and LACFCD's Flood Control District Code ("Code") are potentially applicable to the implementation and enforcement of these requirements, the primary applicable laws and ordinances are as follows:

Los Angeles County Code, Title 12, Chapter 12.80 STORMWATER AND RUNOFF POLLUTION CONTROL, including:

§12.80.010 - §12.80.360 Definitions

§12.80.370 Short title.

§12.80.380 Purpose and intent.

§12.80.390 Applicability of this chapter.

§12.80.400 Standards, guidelines and criteria.

§12.80.410 Illicit discharges prohibited.

§12.80.420 Installation or use of illicit connections prohibited.

§12.80.430 Removal of illicit connection from the storm drain system.

§12.80.440 Littering and other discharge of polluting or damaging substances prohibited.

§12.80.450 Stormwater and runoff pollution mitigation for construction activity.

§12.80.460 Prohibited discharges from industrial or commercial activity.

§12.80.470 Industrial/commercial facility sources required to obtain a NPDES permit.

§12.80.480 Public facility sources required to obtain a NPDES permit.

§12.80.490 Notification of uncontrolled discharges required.

§12.80.500 Good housekeeping provisions.

§12.80.510 Best management practices for construction activity.

§12.80.520 Best management practices for industrial and commercial facilities.

§12.80.530 Installation of structural BMPs.

§12.80.540 BMPs to be consistent with environmental goals.

§12.80.550 Enforcement—Director's powers and duties.

§12.80.560 Identification for inspectors and maintenance personnel.

§12.80.570 Obstructing access to facilities prohibited.

§12.80.580 Inspection to ascertain compliance—Access required.

§12.80.590 Interference with inspector prohibited.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.80.650 Conflicts with other code sections.

§12.80.660 Severability.

§12.80.700 Purpose.

§12.80.710 Applicability.

§12.80.720 Registration required.

§12.80.730 Exempt facilities.

§12.80.740 Certificate of inspection—Issuance by the director.

§12.80.750 Certificate of inspection—Suspension or revocation.

§12.80.760 Certificate of inspection—Termination.

§12.80.770 Service fees.

§12.80.780 Fee schedule.

§12.80.790 Credit for overlapping inspection programs.

§12.80.800 Annual review of fees.

Los Angeles County Code, Title 12, Chapter 12.84 LOW IMPACT DEVELOPMENT STANDARDS, including:

§12.84.410 Purpose.

§12.84.420 Definitions.

§12.84.430 Applicability.

§12.84.440 Low Impact Development Standards.

§12.84.445 Hydromodification Control.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Los Angeles County Code, Title 22 PLANNING AND ZONING, Part 6 ENFORCEMENT PROCEDURES, including:

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

Los Angeles County Code, Title 26 BUILDING CODE, including:

§26.103 Violations And Penalties

§26.104 Organization And Enforcement

§26.105 Appeals Boards

§26.106 Permits

§26.107 Fees

§26.108 Inspections

LACFCD Code Chapter 21 - STORMWATER AND RUNOFF POLLUTION CONTROL including:

§21.01 Purpose and Intent

§21.03 Definitions

§21.05 Standards, Guidelines, and Criteria

§21.07 Prohibited Discharges

§21.09 Installation or Use of Illicit Connections Prohibited

§21.11 Littering Prohibited

§21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity

§21.15 Notification of Uncontrolled Discharges Required

§21.17 Requirement to Monitor and Analyze

§21.19 Conflicts With Other Code Sections

§21.21 Severability

§21.23 Violation a Public Nuisance

California Government Code §6502

California Government Code §23004

California Water Code §8100 *et. seq.*

Relationship Of Applicable Ordinances Or Other Legal Authorities To The Requirements of 40 CFR §122.26(d)(2)(i)(A-F) And The Order

Although, depending upon the particular issue, there may be multiple ways in which particular sections of the County of Los Angeles' ordinances, LACFCD's ordinances, and statutes relate to the requirements contained in 40 CFR §122.26(d)(2)(i)(A-F) and the Order, the table below indicates the basic relationship with Part VI(A)(2)(a) of the Order:

Order Part VI(A)(2)(a) Items	**Primary Applicable Ordinance/Statute**
i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited]; §12.80.450 [construction] §12.80.460 [industrial and commercial] §12.80.470 and .480 [industrial and commercial NPDES requirements] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§26.104 [enforcement] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited] LACFCD Code: §21.07 Prohibited Discharges
iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited]; §12.80.420 [illicit connections prohibited] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.23 Violation a Public Nuisance

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.	Los Angeles County Code: §12.80.410 [illicit discharge prohibited]; §12.80.440 [littering and other polluting prohibited] LACFCD Code: §19.07 Interference With or Placing Obstructions, Refuse, Contaminating Substances, or Invasive Species in Facilities Prohibited §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows).	Los Angeles County Code: §12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.620 [nuisance abatement] §12.80.635 [violation penalty]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§12.80.640 [penalties not exclusive] §12.84.440 [LID standards] §12.84.445 [hydromodification control] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.340 [violations] §22.60.350 [public nuisance] §22.60.360 [infractions] §22.60.370 [injunction] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.103 [violations and penalties] §26.104 [enforcement] §26.106 [permits] §26.108 [inspections] LACFCD Code: §19.11 Violation a Public Nuisance §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§21.19 Conflicts With Other Code Sections §21.23 Violation a Public Nuisance
vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.	Same as item v., above
vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees.	California Government Code §6502 California Government Code §23004
viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation.	California Government Code §6502 California Government Code §23004
ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4.	Los Angeles County Code: §12.80.490 [notification of uncontrolled discharge] §12.80.570 [obstructing access to facilities] §12.80.580 [compliance inspection] §12.80.610 [violation a nuisance] §12.80.620 [nuisance abatement] §12.80.635 [violation penalty] §12.80.640 [penalties not exclusive] §22.60.380 [enforcement.] §26.106 [permits] §26.108 [inspections]

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations.	Los Angeles County Code: §12.80.450 [construction mitigation] §12.80.500 [good housekeeping practices] §12.80.510 [construction BMPs] §12.80.520 [industrial/commercial BMPs] §12.84.440 [LID standards] §12.84.450 [LID Plan Review] §22.60.330 [general prohibitions] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance
xi. Require that structural BMPs are properly operated and maintained.	Los Angeles County Code: §12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze

Order Part VI(A)(2)(a) Items	Primary Applicable Ordinance/Statute
	§21.23 Violation a Public Nuisance
xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.	Los Angeles County Code: §12.80.530 [installation of structural BMPs] §22.60.380 [enforcement.] §22.60.390 [zoning enforcement order] §26.106 [permits] §26.108 [inspections] LACFCD Code: §21.05 Standards, Guidelines, and Criteria §21.07 Prohibited Discharges §21.09 Installation or Use of Illicit Connections Prohibited §21.11 Littering Prohibited §21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity §21.15 Notification of Uncontrolled Discharges Required §21.17 Requirement to Monitor and Analyze §21.23 Violation a Public Nuisance

Order Part VI(A)(2)(b)(ii)

"*Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.*"

The local administrative and legal procedures available to mandate compliance with the above ordinances are specified in those ordinances, particularly in:

Los Angeles County Code:

§12.80.550 Enforcement—Director's powers and duties.

§12.80.600 Notice to correct violations—Director may take action.

§12.80.610 Violation a public nuisance.

§12.80.620 Nuisance abatement—Director to perform work when—Costs.

§12.80.630 Violation—Penalty.

§12.80.635 Administrative fines.

§12.80.640 Penalties not exclusive.

§12.84.450 LID Plan Review.

§12.84.460 Additional Requirements.

Title 26, §103 Violations And Penalties

Title 26, §104 Organization And Enforcement

Title 26, §105 Appeals Boards

Title 26, §106 Permits

§22.60.330 General prohibitions.

§22.60.340 Violations.

§22.60.350 Public nuisance.

§22.60.360 Infractions.

§22.60.370 Injunction.

§22.60.380 Enforcement.

§22.60.390 Zoning enforcement order and noncompliance fee.

LACFCD Code:

§21.05 Standards, Guidelines, and Criteria

§21.07 Prohibited Discharges

§21.09 Installation or Use of Illicit Connections Prohibited

§21.11 Littering Prohibited

§21.13 Evidence of Compliance With Permit Requirements for Industrial or Commercial Activity

§21.15 Notification of Uncontrolled Discharges Required

§21.17 Requirement to Monitor and Analyze

§21.23 Violation a Public Nuisance

LACFCD attempts to first resolve each enforcement action administratively. However, the above cited ordinances also provide LACFCD with the authority to pursue such actions in the judicial system as necessary.

Very truly yours,

JOHN F. KRATTLI
County Counsel

By Judith Fries
JUDITH A. FRIES
Principal Deputy County Counsel
Public Works Division

JAF:jyj

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City of El Segundo

November 18, 2014

Mr. Sam Unger, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

RE: Legal Authority Certification for the City of El Segundo to Implement and Enforce the Requirements of LARWQCB Order R4-2012-0175

Dear Mr. Unger:

The City of El Segundo submits this statement in its capacity as a co-permittee under LARWQCB Order R4-2012-0175 (NPDES No. CAS004001) (the "MS4 Permit"), in accordance with Part VI.A.2 of the MS4 Permit.

I am the City Attorney of the City of El Segundo, California. In that capacity, I state that it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit, consistent with the requirements set forth in the regulations implementing the Clean Water Act (40 CFR § 122.26(d)(2)(i)(A-F)), and to the extent permitted by state and federal law and subject to the limitations on municipal action under the California and United States Constitutions.

The primary source of the City's authority is Article 11, § 7 of the California Constitution. The City also has authority under California Water Code § 13002 to adopt and enforce regulations conditioning, restricting and limiting activities which might degrade the quality of waters of the State. In accordance with these laws, the City adopted El Segundo Municipal Code ("ESMC") Chapters 5-4 and 5-7 which include the City's regulations enabling it to implement the MS4 Permit. As the City transitions to the new EWMP requirements, these regulations may be amended to implement the new programs. Nevertheless, the City has already the legal authority as required under Part VI.A.2 of the MS4 Permit.

California law also authorizes the City to require the use of control measures to prevent or reduce the discharge of pollutants and ensure that such control measures are properly operated and maintained. The City's regulatory authority is supplemented by the California Environmental Quality Act ("CEQA") process by allowing the City to impose enforceable mitigation measures on development projects. As a general law city and municipal corporation, the City may enter into contracts that enable it to carry out its necessary functions including, without limitation, the ability to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

Pursuant to ESMC Chapters 1-2, 1-2A, and § 5-4-11, the City's regulations may be enforced administratively, civilly and criminally. The ESMC also provides various procedures to modify and/or revoke city-issued permits for unlawful and/or environmentally disruptive activity.

Consequently, it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit. Please do not hesitate to contact me should you have any questions or need any additional information

Very truly yours,
Mark D. Hensley, City Attorney

By: ______________________
Karl H. Berger,
Assistant City Attorney

CITY OF HAWTHORNE

4455 West 126th Street • Hawthorne, California 90250-4482

Department of Public Works, Engineering Division

Office (310) 349-2980 Fax (310) 978-9862

Mr. Sam Unger, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

December 1, 2014

RE: Legal Authority Certification for the City of Hawthorne

The City, by and through its legal counsel, hereby submits the following certification, pursuant to Part VI.A.2 of Order No. R4-2012-0175, issued by the Regional Water Quality Control Board — Los Angeles Region ("RWQCB"), adopted on December 28, 2012 and entitled "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)" [NPDES No. CAS004001] (the "2012 NPDES Permit"). Part VI.A.2 of the 2012 NPDES Permit requires the City, as a Permittee, to submit a new or updated statement by its legal counsel that the Permittee has obtained all necessary legal authority to comply with the Permit.

The City, as a general law city, has broad general police powers under the Constitution of the State of California to enact legislation for health and public welfare of the community to the extent not preempted by federal or state law. In addition to the provisions of the municipal Code, which provide various enforcement and nuisance abatement powers, the City has adopted specific stormwater ordinances for the purpose of ensuring that it has adequate legal authority to implement and enforce its stormwater control program and to implement the programs prescribed by the 2012 and preceding NPDES Permits. The City has the authority under the Constitution and statutes of the State of California to enact and enforce these ordinances, and these ordinances were duly enacted. These ordinances contain specific enforcement provisions under the generally applicable enforcement provisions of the Municipal Code.

Based on its prior adoption of comprehensive stormwater ordinances, which have been and continue to be amended as and when required by applicable NPDES permits and RWQCB orders, as well as other parts of its Municipal Code, the City previously submitted statements to the RWQCB confirming that it has all necessary legal authority to control discharges to and from those portions of the Municipal Separate Storm Sewer System (MS4) over which the City has jurisdiction through adoption of ordinances and/or municipal code modifications, regulations and other legal documents. The purpose of this letter is to provide the RWQCB with an updated statement confirming the City's compliance with Part VI.A.2 of the 2012 NPDES Permit.

In our opinion, as of the date of this letter, the City has adequate legal authority, as envisioned by the 2012 NPDES Permit, the Clean Water Act and applicable regulations promulgated thereunder, specifically, 40 CFR 22.26(d)(2)(i)(A-F), to implement the requirements of the 2012 NPDES Permit by the mandated dates, and to enforce such additional requirements after they have been implemented, consistent with the requirements set forth in the U.S. Environmental Protection Agency's regulations and to the extent permitted by State and Federal law, subject to the limitations on municipal action under the California and United States Constitutions, and that the City has obtained the necessary legal authority to control and prohibit discharges of pollutants into the Municipal Separate Storm Sewer System, as required by the 2012 NPDES Permit.

Should you have any questions regarding the City's legal authority, please feel free to call me at 310-349-2960 or E-Mail me at rmiyahira@cityofhawthorne.org.

Sincerely,

Russell Miyahira

Russell Miyahira
City Attorney

cc: Arnold Shadbehr, P.E.
John L. Hunter & Associates

JENKINS & HOGIN, LLP
A LAW PARTNERSHIP

MICHAEL JENKINS
CHRISTI HOGIN
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December 8, 2014

Mr. Sam Unger, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

RE: Legal Authority Certification for the City of Lomita to Implement and Enforce the Requirements of LARWQCB Order R4-2012-0175

Dear Mr. Unger:

The City of Lomita submits this statement in its capacity as a co-permittee under LARWQCB Order R4-2012-0175 (NPDES No. CAS004001) (the "MS4 Permit"), in accordance with Part VI.A.2 of the Order.

I am the City Attorney of the City of Lomita, California. In that capacity, I state that it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit, consistent with the requirements set forth in the regulations implementing the Clean Water Act, 40 CFR § 122.26(d)(2)(i)(A-F), and to the extent permitted by state and federal law and subject to the limitations on municipal action under the California and United States Constitutions.

The primary source of the City's authority is Article 11, § 7 of the California Constitution. The City also has authority under § 13002 of the California Water Code to adopt and enforce ordinances conditioning, restricting and limiting activities which might degrade the quality of waters of the State. Pursuant to Article 11, § 7 of the California Constitution and § 13002 of the California Water Code, the City adopted Chapters 5-8 and 5-9 of the Lomita Municipal Code ("LMC"), which contains the City's regulations enabling it to impose the legal requirements of the MS4 Permit (see attached analysis of legal authority). Thus, the City has the legal authority as required under Part VI.A.2 of the MS4 Permit.

Article 11, § 7 also provides the City the authority to require the use of control measures to prevent or reduce the discharge of pollutants and ensure that such control measures are properly operated and maintained. The City's environmental requirements are also implemented in part through the application of the California Environmental Quality Act ("CEQA") process to proposed projects, as enforceable mitigation measures. The City, as a municipal corporation, has authority to enter into contracts that enable it to carry out its necessary functions, including the power to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

Pursuant to LMC Chapters 1-2 Penalty Provisions, 5-8 Stormwater and Runoff Pollution Control Storm Drains and 5-9 Standard Urban Stormwater Mitigation Plan Implementation, the City's regulations may be enforced administratively through a notice to correct violations, civilly as a public nuisance and criminally. The LMC also provides various procedures to modify and/or revoke city-issued permits for unlawful and/or environmentally disruptive activity.

Consequently, it is my opinion that the City has adequate legal authority to implement and enforce the requirements in the MS4 Permit. Please do not hesitate to contact me should you have any questions or need any additional information

Very truly yours,

Christi Hogin
City Attorney

Enclosure

Lomita Statement of Legal Authority

A. The following list shows the relationship of the Lomita Municipal Code[1] and other legal authorities to the MS4 permit requirements under Part VI.A.2 of the Permit:

i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC Chapter 5-9 Standard Urban Stormwater Mitigation Plan Implementation; LCC 12.80.450 Stormwater and Runoff Pollution Mitigation for Construction Activity; LCC 12.80.460 Prohibited Discharges from Industrial and Commercial Activity; LCC 12.80.470 Industrial/Commercial Facility Sources Required to Obtain NPDES Permit

ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LCC 12.80.410 Illicit Discharges Prohibited

iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LCC 12.80.410 Illicit Discharges Prohibited; LCC 12.80.420 Installation or Use of Illicit Connection to Stormdrain Prohibited; LCC 12.80.430 Removal of Illicit Connection from Stormdrain System

iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LCC 12.80.440 Littering and Other Discharge of

[1] LMC 5-8-02 adopts by reference Chapter 12.80 of Title 12 of the Los Angeles County Code. All references to LCC are from this Chapter 12.80.

Polluting or Damaging Substances Prohibited

v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows).

LMC Chapter 1-2 Penalty Provisions; LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC Chapter 5-9 Standard Urban Stormwater Mitigation Plan Implementation; Part 4 of LCC Chapter 12.80 Runoff Management Requirements and Part 5 of LCC Chapter 12.80 Violations and Enforcement

vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.

LMC Chapter 1-2 Penalty Provisions; LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-200 Violations; Part 5 of LCC Chapter 12.80 Violations and Enforcement

vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees.

In addition to the provisions of LMC Chapter 5-8, which control the contribution of pollutants, the City, as a municipal corporation, has authority to enter into contracts that enable it to carry out its necessary functions, including the power to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation.

In addition to the provisions of LMC Chapter 5-8, which control the contribution of pollutants, the City, as a municipal corporation, has authority to enter into contracts that enable it to carry out its necessary functions, including the power to enter into interagency agreements to control the contribution of pollutants from one portion of the shared MS4 to another.

ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4.

LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-210 Inspections; LCC 12.80.580 Inspection to Ascertain Compliance—Access Required

x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations.

Article 11, § 7 of the California Constitution; California Public Resources Code § 21000 et seq. (CEQA); LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-06 Best Management Practices; Part 4 of LCC Chapter 12.80 Runoff Management Requirements; LMC Title 11 Zoning

xi. Require that structural BMPs are properly operated and maintained.

Article 11, § 7 of the California Constitution; California Public Resources Code § 21000 et seq. (CEQA); LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-060 Best Management Practices; LMC 5-9-110 Maintenance of Best Management Practices; LMC 5-9-120 Design Standards for Best Management Practices; Part 4 of LCC Chapter 12.80 Runoff Management Requirements; LMC Title 11 Zoning

xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.

California Public Resources Code § 21000 et seq. (CEQA); LMC Chapter 1-2 Penalty Provisions; LMC 5-8-02 Adoption of Los Angeles County Stormwater and Runoff Pollution Ordinance; LMC 5-9-200 Violations; Part 5 of LCC Chapter 12.80 Violations and Enforcement

B. Procedures available to mandate compliance with applicable municipal ordinances under LMC Chapters 1-2 Penalty Provisions, 5-8 Stormwater and Runoff Pollution Control and 5-9 Standard Urban Stormwater Mitigation Plan Implementation and LCC Chapter 12.80:

1. Criminal Citation (judicial)

2. Administrative Notice of Violation (administrative)
3. Civil Nuisance Abatement (judicial)
4. Permit Revocation/Modification (administrative)
5. All other criminal and civil remedies available by law

City of Carson DC EWMP Legal Authority

Certification Statement

"I certify under penalty of law that this document and all attachments were prepared by *Paradigm Environmental* under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility, of a fine and imprisonment for knowing violations."

Executed on the 24th day of February 2016 at the City of Carson

Printed Name	Gilbert Marquez
Title	Principal Civil Engineer/City Engineer
City Name	City of Carson
Signature	2/24/2016

Signature by duly authorized representative (e.g., Public Works Director, City Engineer, City Manager, or any designee thereof).

CITY OF INGLEWOOD

One W. Manchester Boulevard, Suite 860, Inglewood, CA 90301-1750

Office of the City Attorney

Kenneth R. Campos
City Attorney

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June 24, 2015

VIA ELECTRONIC TRANSMISSION

Mr. Samuel Unger
Executive Officer
Los Angeles Regional Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013
sunger@waterboards.ca.gov

Re: Legal Authority of the City of Inglewood to Implement and Enforce the Requirements of 40 C.F.R. § 122.26(d)(2)(i)(A-F) and RWQCB Order R4-2012-0175, NPDES Permit CAS004001

Dear Mr. Unger:

The City of Inglewood (the "City"), by and through its City Attorney, hereby submits the following certification ("Statement"), pursuant to Section VI.A.2.b of Order R4-2012-0175 (NPDES Permit CAS004001), issued by the California Regional Water Quality Control Board, Los Angeles Region ("RWQCB") on November 8, 2012 and entitled "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" (the "Permit").

The City is one of the co-permittees under the Permit. Section VI.A.2.b of the Permit requires the City to provide the RWQCB with a statement by its chief legal counsel, certifying that the City has the legal authority to implement and enforce each of the current requirements set forth in 40 C.F.R. § 122.26(d)(2)(i)(A-F) and the Permit. The purpose of this Statement is to describe the City's compliance with Section VI.A.2.b of the Permit. As discussed in further detail herein, it is our opinion that the City has the necessary legal authority to implement the Permit and to control and prohibit discharges of pollutants into the Municipal Separate Storm Sewer System ("MS4"). However, this Statement is not, nor should it be construed as, a waiver of any rights that the City may have relating to the Permit.

1. Legal Authority Statement

In our opinion, the City has the necessary legal authority to comply with the legal requirements imposed upon it under the Permit, consistent with the requirements set forth in the U.S. Environmental Protection Agency's regulations promulgated under the Clean Water Act, and, specifically, 40 C.F.R. § 122.26(d)(2)(i)(A-F), and to the extent permitted by state and federal law and subject to the limitations on municipal action under the California and United States Constitutions, except as noted herein.

The City has broad general police powers under the California Constitution to enact legislation for health and public welfare of the community to the extent not preempted by federal or state law. In addition, the City adopted ordinances for the purpose of ensuring that it has adequate legal authority to implement and enforce its stormwater control program. The City has the authority under the California Constitution and state law to enact and enforce these ordinances, and these ordinances were duly enacted.

2. Ordinances

The City has adopted ordinances related to the regulation of urban runoff to control and prohibit discharges of pollutants into the MS4 and to comply with the requirements of the Permit applicable to it, as well as, to the extent applicable, 40 C.F.R. § 122.26 (d)(2)(i)(A)-(F). The City's Stormwater Ordinance (Article 16 of Chapter 10 of the Inglewood Municipal Code ("IMC")) is the principal City ordinance addressing the control of urban runoff. Under this Stormwater Ordinance, the City has the necessary legal authority to do the following:

i. 40 C.F.R. § 122.26(d)(2)(i)(A); Permit Section VI.A.2.a.i: Control the contribution of pollutants to its MS4 from stormwater discharges associated with industrial and construction activity and control the quality of stormwater discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit (IMC § 10-207 – Requirements for Industrial/Commercial and Construction Activities);

ii. 40 C.F.R. § 122.26(d)(2)(i)(C); Permit Section VI.A.2.a.ii: Prohibit all non-stormwater discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A (IMC § 10-204 – Prohibited Activities; IMC § 10-206 – Requirements for Existing Properties);

iii. 40 C.F.R. § 122.26(d)(2)(i)(B); Permit Section VI.A.2.a.iii: Prohibit and eliminate illicit discharges and illicit connections to the MS4 (IMC § 10-204 – Prohibited Activities);

iv. 40 C.F.R. § 122.26(d)(2)(i)(C); Permit Section VI.A.2.a.iv: Control the discharge of spills, dumping, or disposal of materials other than stormwater to its MS4 (IMC § 10-204 – Prohibited Activities; IMC § 10-206 – Requirements for Existing Properties; IMC § 10-211 – Enforcement);

v. 40 C.F.R. § 122.26(d)(2)(i)(E); Permit Section VI.A.2.a.v: Require compliance with conditions in Permittee ordinances, permits, contracts or orders (*i.e.*, hold dischargers to its MS4 accountable for their contributions of pollutants and flows) (IMC § 10-211 – Enforcement);

vi. 40 C.F.R. § 122.26(d)(2)(i)(E)-(F); Permit Section VI.A.2.a.vi: Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders (IMC § 10-211 – Enforcement);

vii. 40 C.F.R. § 122.26(d)(2)(i)(D); Permit Section VI.A.2.a.vii: Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees (IMC § 10-204 – Prohibited Activities; IMC § 10-211 – Enforcement);

viii. 40 C.F.R. § 122.26 (d)(2)(i)(D); Permit Section VI.A.2.a.viii: Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation (IMC § 10-204 – Prohibited Activities; IMC § 10-211 – Enforcement);

ix. 40 C.F.R. § 122.26(d)(2)(i)(F); Permit Section VI.A.2.a.ix: Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-stormwater discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4 (IMC § 10-208 – Low Impact Development Requirements for New Development and Redevelopment; IMC § 10-211 – Enforcement);

x. 40 C.F.R. § 122.26(d)(2)(i)(E); Permit Section VI.A.2.a.x: Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations (IMC § 10-208 – Low Impact Development Requirements for New Development and Redevelopment; IMC § 10-204 – Prohibited Activities; IMC § 10-206 – Requirements for Existing Properties; IMC § 10-211 – Enforcement);

xi. 40 C.F.R. § 122.26(d)(2)(i)(E); Permit Section VI.A.2.a.xi: Require that structural BMPs are properly operated and maintained (IMC § 10-208 – Low Impact Development Requirements for New Development and Redevelopment; IMC § 10-206 – Requirements for Existing Properties; and IMC § 10-207 – Requirements for Industrial/Commercial and Construction Activities); and

xii. 40 C.F.R. § 122.26(d)(2)(i)(E); Permit Section VI.A.2.a.xii: Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4 (IMC § 10-208 – Low Impact Development Requirements for New Development and Redevelopment; IMC § 10-206 – Requirements for Existing Properties; IMC § 10-211 – Enforcement).

Furthermore, in June 2015, the City updated its Stormwater Ordinance to include regulations specifically addressing low impact development to comply with the Permit's Planning and Land

Development Program requirements. The City's LID provisions of its Stormwater Ordinance are located in IMC § 10-208 – Low Impact Development Requirements for New Development and Redevelopment.

3. Implementation

Some of the City's ordinances are implemented through permit programs and others are implemented as regulatory programs. Under each ordinance, one or more City bodies, departments, or department directors are authorized and directed in each ordinance to take the actions contemplated by the ordinance (*e.g.*, to consider evidence and make findings, to issue or deny permits, to impose conditions on projects, to inspect, to take enforcement action, etc.).

The City's Stormwater Ordinance (IMC Article 16 of Chapter 10) is the principal City ordinance addressing the control of urban runoff. This ordinance is regulatory, and applies to specified new and existing residential and business communities and associated facilities and activities, as well as new development and redevelopment, and all other specified new and existing facilities and activities that threaten to discharge pollutants within the boundaries of the City and within its regulatory jurisdiction, whether or not a City permit or approval is required. The City's Stormwater Ordinance also contains discharge prohibitions and requirements for the implementation of BMPs and other requirements necessary to implement the Permit.

Other City departments require compliance with the City's Stormwater Ordinance as a condition for issuance of relevant City permits. City departments may also impose specific conditions of approval consistent with the City's Stormwater Ordinance. All City environmental ordinances are also implemented, in part, through the application of the CEQA process to proposed projects.

4. Administrative and Judicial/Legal Procedures

In addition to the above authority, the City has in place various legal and administrative procedures to assist in enforcing the various urban run-offs related Ordinances, including the following:

A. Administrative Remedies

- General Penalties (IMC § 1-18 – Penalty Provisions)
- Administrative Penalties and Compliance Orders (IMC Article 3 of Chapter 1; IMC § 10-211 – Enforcement).

B. Nuisance Remedies

- Public nuisance under State law and the Municipal Code (IMC § 10-211 – Enforcement).
- City nuisance abatement procedures (IMC Article 11.1 of Chapter 11)

C. Criminal Remedies

- Misdemeanor citations/prosecution (IMC § 1-18 – Penalty Provisions; IMC § 1-18.3 – Authority of City Attorney to File Misdemeanor Charges; IMC § 10-211 – Enforcement).

D. Equitable Remedies

- Injunctive relief under State law.
- Declaratory relief under State law.

E. Other Civil Remedies

- Federal law claims (*e.g.*, Clean Water Act and Resource Conservation and Recovery Act Citizen Suits).
- Remedies under the California Government Code.

Violations of the City's Stormwater Ordinance are deemed a "public nuisance," in which case enforcement actions can be completed administratively, or judicially when necessary.

Please contact me if you have any questions or if you need any additional information regarding the City's legal authority to enforce the Permit.

Very truly yours,

Kenneth R. Campos
City Attorney

ALESHIRE & WYNDER LLP
ATTORNEYS AT LAW

ORANGE COUNTY | LOS ANGELES | RIVERSIDE | CENTRAL VALLEY

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December 9, 2015

Mr. Sam Unger
Executive Officer
Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013-1105

Re: Legal Authority Statement

Dear Mr. Unger:

This letter is provided as the Statement of Legal Authority for the City of Lawndale (the "City"), which is required to be submitted with the City's Annual Report pursuant to Part VI.A.2.b. of Order No. R4-2012-0175 for NPDES Permit No. CAS004001. As legal counsel for the City, we are of the considered legal opinion that the City has the necessary legal authority to implement and enforce the requirements contained in 40 CFR § 122.26(d)(2)(i)(A-F) during the reporting period of July 1, 2014 through June 30, 2015, to the extent permitted by State and Federal law, subject to the limitations on municipal action under the California and United States Constitutions.

Per the requirement in Part VI.A.2.b.i., here are citations to the City's Municipal Code for each of the following requirements found in Part VI.A.2.a:

i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.

Municipal Code Sections: 13.12.040 Control of pollutants from sites of industrial activity and 13.12.070 Construction activity storm water measures

ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A.

Municipal Code Section: 13.12.020 Illicit discharges prohibited

iii. *Prohibit and eliminate illicit discharges and illicit connections to the MS4.*

Municipal Code Section: 13.12.020 Illicit discharges prohibited

iv. *Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4.*

Municipal Code Section: 13.12.050 Spills, dumping and disposal prohibited

v. *Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);*

Municipal Code Sections: 13.12.010 Definitions and 13.12.020 Illicit discharges prohibited

vi. *Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders.*

Municipal Code Sections: 13.12.080 Violations, 13.12.090 Notices of violation—Administrative orders—Enforcement, 13.12.100 Nuisance, and 13.12.110 Remedies not exclusive

vii. *Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees;*

Municipal Code Section: 13.12.020 Illicit discharges prohibited

viii. *Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation;*

Municipal Code Section: 13.12.020 Illicit discharges prohibited

ix. *Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4;*

Municipal Code Section: 13.12.120 Inspections—Searches

x. *Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations;*

Municipal Code Section: 13.12.060 Best management practices required

xi. *Require that structural BMPs are properly operated and maintained;*

Municipal Code Sections: 13.16.060 Stormwater pollution control and design standards for best management practices (BMPs) and 13.16.110 Maintenance of best management practices

xii. *Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.*

Municipal Code Sections: 13.16.060 Stormwater pollution control and design standards for best management practices (BMPs) and 13.16.110 Maintenance of best management practices

Per the requirement in Part VI.A.2.b.ii., the City's legal procedures available to mandate compliance with applicable municipal ordinances identified in the above section and, therefore, with the conditions of the Order, can be found in Municipal Code Sections 13.12.080 Violations, 13.12.090 Notices of violation—Administrative orders—Enforcement, 13.12.100 Nuisance, and 13.12.110 Remedies not exclusive. The text of those provisions state the following:

13.12.080 Violations.

Violation of any provision of this chapter, any storm water pollution prevention plan, any provision of any permit issued pursuant to this chapter, or any administrative compliance order issued pursuant to this chapter is punishable as an infraction pursuant to Section 1.08.030 of this code or punishable as a misdemeanor pursuant to Section 1.08.020 of this code.

13.12.090 Notices of violation—Administrative orders—Enforcement.

A. The director of public works, or the director's designees, may issue notices of violation and administrative compliance orders to achieve compliance with the provisions of this chapter, any approved storm water pollution prevention plan or any permit issued pursuant to this chapter. Failure to comply with the terms and conditions of such a notice of violation or an administrative order shall constitute a violation of this chapter.

B. The city attorney may bring civil and criminal actions to enforce this chapter, including, but not limited to, the provisions of any administrative compliance order, any storm water pollution prevention plan or any permit issued pursuant to this chapter.

13.12.100 Nuisance.

The violation of any provision of this chapter is hereby declared to be a nuisance, and may be abated by the city in accordance with its authority to abate nuisances.

13.12.110 Remedies not exclusive.

The remedies listed in this chapter are not exclusive of any other remedies available to the city under any applicable federal, state or local law and it is within the discretion of the city to seek cumulative remedies.

Thus, enforcement actions can be completed administratively or judicially if necessary.

Please contact us with any questions.

Very truly yours,

ALESHIRE & WYNDER, LLP

Tiffany J. Israel
City Attorney

TJI:MPH

Attachment X

Los Angeles County-Wide Structural BMP Prioritization Methodology

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STEP 1: CATCHMENT PRIORITIZATION

The primary objective of this step is to develop a Catchment Prioritization Index (CPI) for each catchment area. The CPI represents the relative need for of each catchment for a BMP. Figure 5 illustrates the intermediate steps required for developing a CPI score for each catchment area of a watershed.

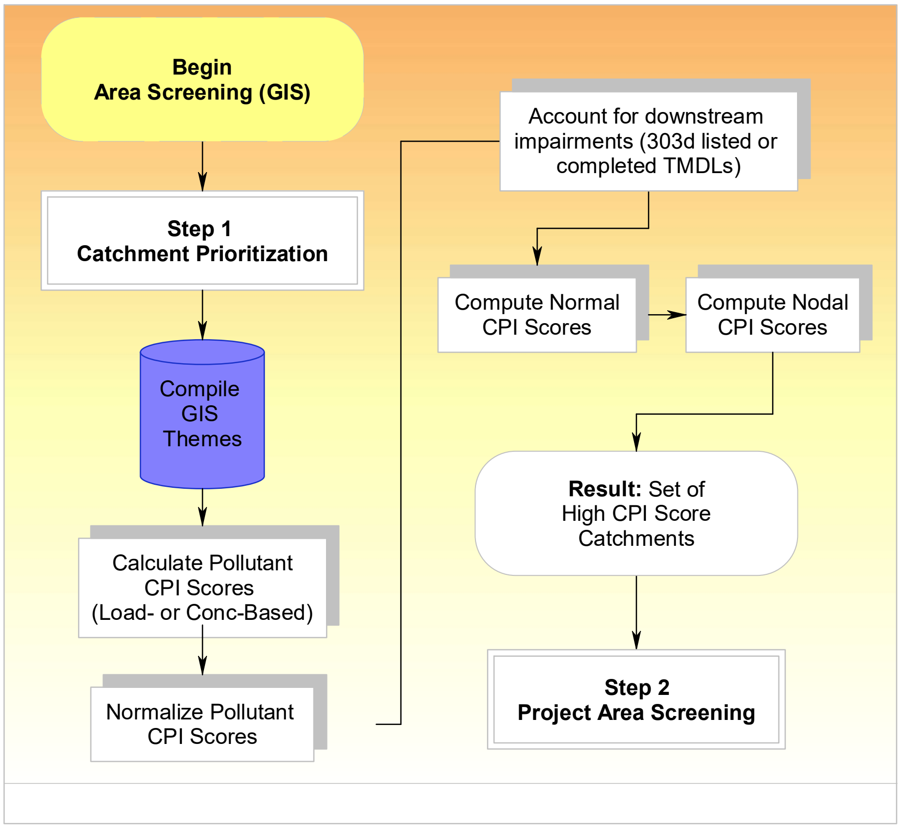

Figure 5. Step 1 - Catchment Prioritization flowchart.

a. **Compile relevant GIS themes**.

The following GIS layers are required for catchment prioritization: catchment drainage boundaries (approximately 40-acre scale), land uses (grouped by general land-use category; see Appendix Agrouping table), 85th-percentile 24-hour rainfall contours (i.e., SUSMP storm depth), reach 303(d) impairments and completed TMDLs (by pollutant group; see Appendix B grouping table), water bodies, and drainage network. Table 1 below summarizes the data types, scale/resolution, and purposes for each GIS theme proposed for use in this step.[1] If approximately 40-acre catchment boundaries are not available, perform necessary delineations. If delineations are not feasible, use available catchment sizes.[2]

[1] Availability of GIS data will vary with jurisdiction. The Methodology attempts to establish a hierarchy by which the best available data can be used for this effort. Should the best data not be available, alternate data sources can be used as described herein.

[2] Since the pollutant load estimates are normalized by area, this limitation should not significantly impact the pollutant load indices per acre estimates as long as catchment sizes are approximately the same. As land uses are summarized for larger catchment areas, there will be fewer catchments characterized by land-use extremes, and therefore the normalized CPI scores of larger catchments may tend more toward average priority conditions rather than high or low. In addition, it will not be feasible to examine the aerial photos of these larger prioritized catchments on 8½ x 11” printouts; poster-size graphic analyses may be required.

Table 1. GIS Data Used for Catchment Prioritization

Data	Type	Scale/ Resolution	Purpose
Catchment Prioritization			
Catchments	Polygon	40-acre drainage unit	Primary unit of analysis
Land use	Polygon or grid	Maximum mapping unit of 2½ acres	Calculate area-weighted runoff coefficient and pollutant-loading/EMC scores per catchment
85^{th}-percentile 24-hour rainfall depth contours	Line		Calculate average storm event precipitation depth per catchment
Trash (from City/County catch basin monitoring studies)	Polygon		Compute catchment trash CPI scores (where actual monitoring data is available)
303(d)-listed impaired water bodies	Line/polygon		Designate catchments with downstream impairments
Completed TMDLs	Line/polygon		Designate catchments with downstream completed TMDLs
Hydrologic drainage network with connectivity (to/from nodes)	Line/Point		Designate catchments with downstream impairments/TMDLs
Topography	Grid (DEM)	10-m cellsize	If drainage network unavailable, used to designate catchments with downstream impairments/TMDLs

b. **Estimate relative pollutant loading indices.** Using the delineated catchment boundaries and available land-use and rainfall data, estimate relative pollutant loading for each catchment using the following steps.

b.1 **Compute area-weighted land-use percentages**. Intersect the land-use data layer with the catchment layer to create a set of "subpolygons" for each land use within each catchment. Sum the areas for these individual subpolygons by land use. Convert the sums to percentages by dividing by the total area of each catchment. This procedure can be automated in a GIS system to simultaneously compute these statistics for all catchments in a given study area.

b.2 **Calculate or obtain land-use runoff coefficients**. Bring land-use runoff coefficients into GIS database. *Calibrated* land-use runoff coefficients from Ackerman & Schiff 2003 mass emission modeling study of Southern California Bight (see Table 2) are recommended[3]. Subpolygon discretization may be required here as well.

[3] This reference was selected for the purpose of runoff coefficient estimation because its study area (Southern California Bight) is similar in scale and location to our own (Los Angeles County), and because these values have been calibrated to stream discharge volumes and rainfall, summarized by storm, for the 1993-1999 period. Therefore, these values represent reasonable parameter estimates for *average regional* runoff conditions. Users should note that by using such large-scale based runoff coefficients, volume estimates may be underestimated for small catchments. These coefficients were deemed acceptable for the purposes of computing *relative* load scores. Coefficient values should not be used for explicit catchment-scale pollutant load modeling.

Table 2. Recommended Land Use Runoff Coefficients - Optimized Model Runoff Coefficients by Land Use for Southern California Bight (Ackerman & Schiff, 2003)

Land Use	Runoff Coefficient
Agriculture	0.10
Commercial/Educational	0.61
Industrial/Transportation/Other Urban[4]	0.64
Open	0.06
Residential	0.39

Alternatively, runoff coefficients may be calculated based on imperviousness either by using land use-based imperviousness values or by using a watershed-wide imperviousness GIS layer to obtain site-specific runoff coefficients. Several guidance documents are available that provide imperviousness-dependent runoff coefficient equations including:

- WEF (1998). Urban Runoff Quality Management. WEF Manual of Practice #23. ASCE Manual and Report on Engineering Practice #87
- Schueler, T. (1987), Controlling Urban Runoff, A Practical Manual for Planning and Designing Urban BMPs, Metropolitan Washington Council of Governments.
- LACDPW (2006). Hydrology Manual. Los Angeles County Department of Public Works, Water Resources Division.

Figure 6 provides a graphical comparison of the three different types of imperviousness-dependent runoff coefficient equations. Note that the LACDPW equation requires soils information to estimate the undeveloped runoff coefficient (Cu) prior to estimating the developed runoff coefficient (Cd); Cu values of 0.1 and 0.5 are shown in Figure 6 to represent a potential range of soil types and precipitation intensities.

[4] “Other urban” category, which included includes “mixed industrial/commercial” and “under construction” SCAG land use categories, represents <1% of total County area.

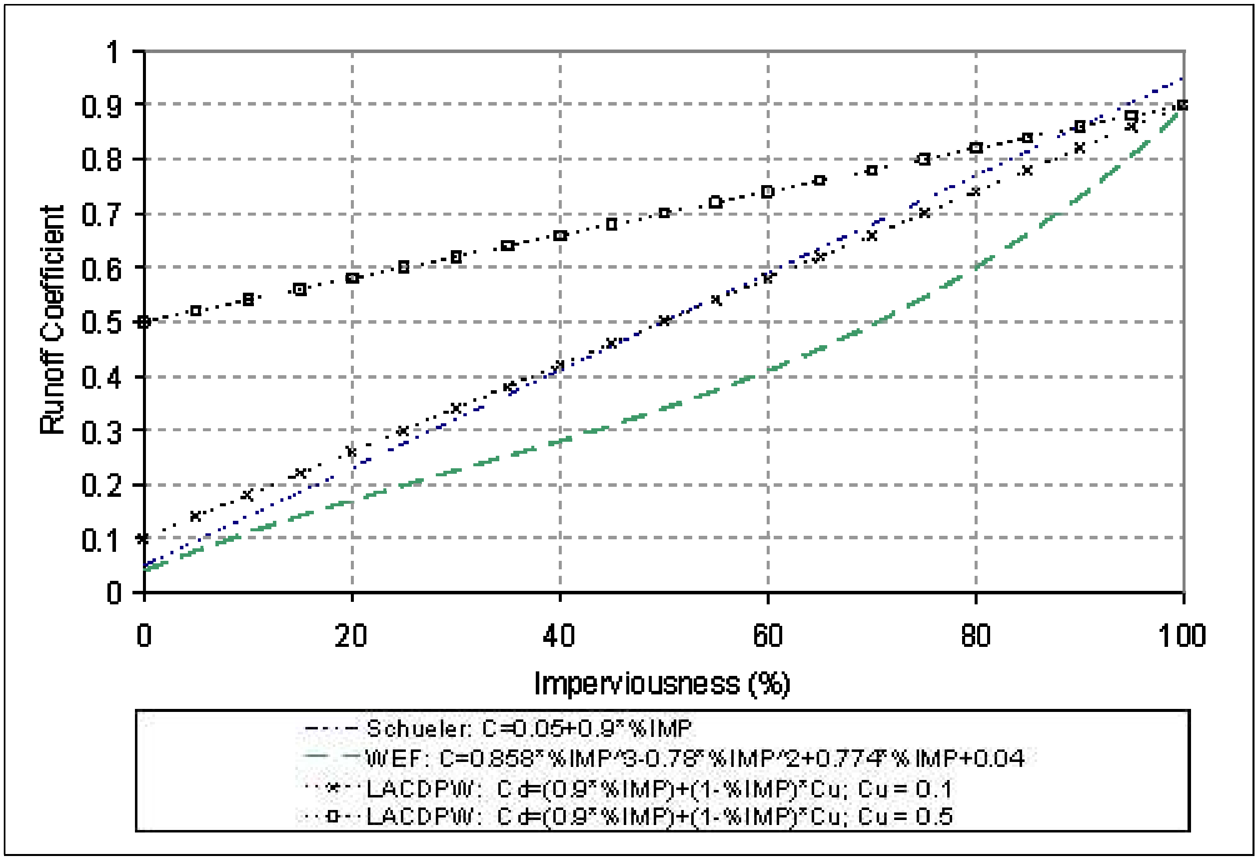

Figure 6. Comparison of imperviousness dependent runoff coefficient equations.

b.3 **Target storm size**. Define average target precipitation depth (see Figure 7) for each catchment. The LA County 85th-percentile 24-hour depth values are recommended and available as either rain gage (point) data or contour lines of equal rainfall (isohyets), which would be derived from the gage data. To create a grid version of rainfall, which can then be used to determine average rainfall per catchment, use the gage data[5]. Other rainfall indices may be used as well.

- Within the GIS, interpolate a grid from the gage point depths (1,000-foot grid using Inverse Distance Weighted interpolation scheme).
- Create zonal statistics for the catchments based on the newly created rainfall grid, and then use the mean rainfall value to represent the average rainfall for the catchment.

[5] Grid derivation based on method described in "Analysis of 85th-Percentile 24-hour Rainfall Depth Analysis within the County of Los Angeles," Los Angeles County Department of Public Works, Water Resources Division, February 2004. Use of rainfall data is not advised by LACDPW unless site specific Event Mean Concentrations are available.

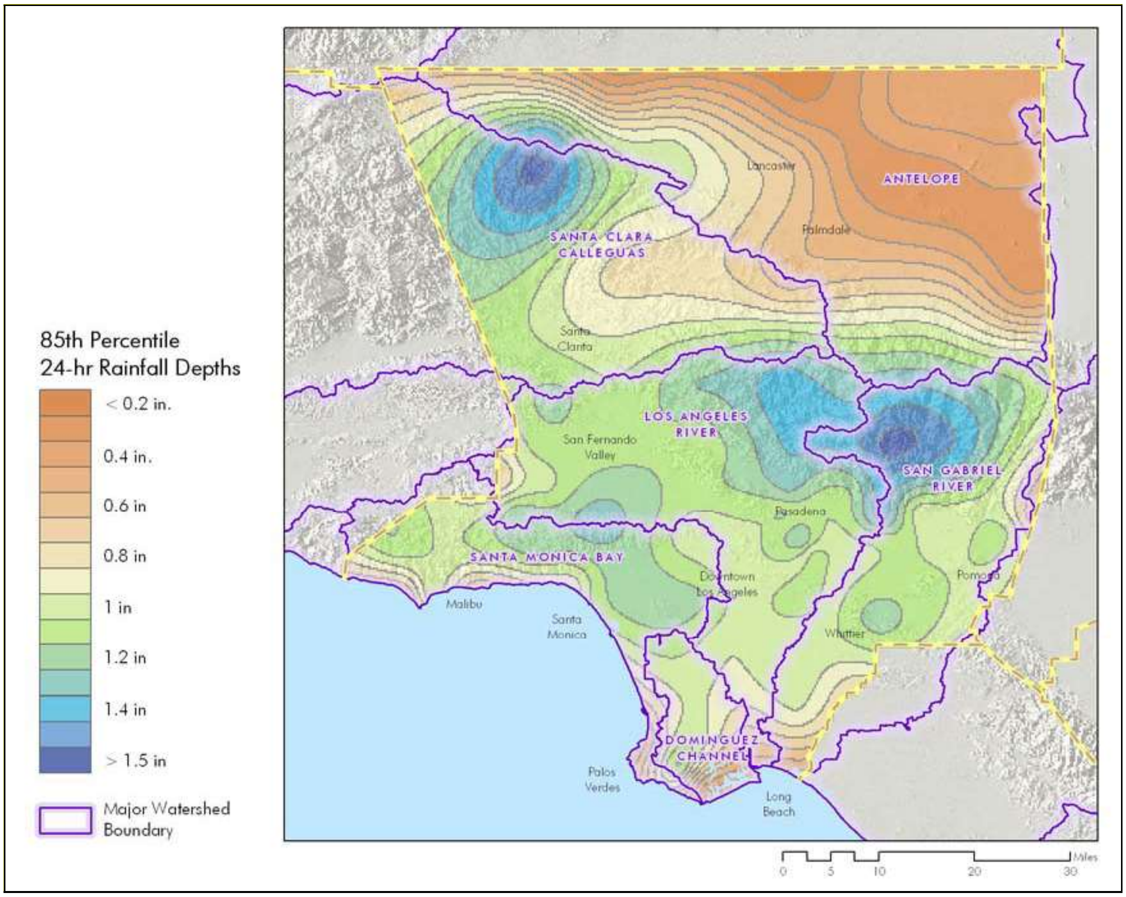

Figure 7. Recommended average target precipitation depths - Average annual precipitation isohyets for Los Angeles County

b.4 **Calculate or obtain land-use EMCs**. Bring land-use event mean concentrations (EMCs) using EMC values provided in Table 3 into GIS database. Recommended pollutant groups[6] (with indicator in parentheses) are: trash, nutrients (nitrate), metals (total copper, total lead, and total zinc), bacteria (fecal coliform), and sediment (TSS). The final determination of BMPs will require that the full distribution of EMC values be examined, along with numerous other factors.[7] A fundamental assumption inherent to this approach is that EMCs are solely a function of (or at least, best approximated by) land use.

[6] These pollutant groups and indicators were to represent each of the major general TMDL pollutant categories, with specific focus on those known to be present in significant quantities in urban stormwater runoff. Total metals were preferred over dissolved metals – even though the dissolved fraction is the more bioavailable fraction – because dissolved fractions are influenced by hardness, and therefore total values represent the more conservative estimate of metals concentrations in the water column.

[7] It is recognized that actual stormwater pollutant concentrations can vary by over an order of magnitude above or below the "average" EMC values shown.

Table 3. Average[8] EMCs[9] by Land Use for Study Indicator Pollutants

Land Use	Trash[10], cf/ac	Nitrate, mg/L-N	Total Copper, ug/L	Total Lead, ug/L	Total Zinc, ug/L	Fecal Coliform[11], MPN/100ml	TSS, mg/L
Agriculture	0.0	11.3	84.1	20.4	246.6	6,842	699
Commercial/ Educational	1.0	0.46	18.8	2.1	127.5	72,035	58
Industrial/ Transportation/ Other Urban	1.0	0.49	31.6	4.3	289.5	32,679	81
Open	0.0	1.0	3.8	0.01	2.1	255	28
HDSF Residential	1.0	0.30	14.7	5.0	52.6	98,272[12]	65
MF Res/ Mixed Res.	1.0	0.57	12.3	2.5	116.3		32.6

[8] Log-transformed arithmetic mean values shown, except for trash (see footnote below for trash EMC description).

[9] EMCs for nitrate, metals, and TSS are based on Los Angeles County 1994-2000 flow-weighted composite-sampled land use runoff monitoring data, with the exception of agriculture, which was developed from Ventura County 1994-2004 land-use EMC data. Summary statistics shown are geometric mean values, determined using a robust Regression on Ordered Statistics (plus bootstrapping) method for estimating below-detection results (Hirsch & Stedinger 1987). Other land use runoff monitoring datasets (such as those of the Southern California Coastal Water Research Project (SCCWRP) and the National Urban Runoff Project (NURP)) were considered, however Los Angeles County's datasets were preferred as they are considered to be most statistically representative of the region.

[10] Trash summary statistics shown are median values (which are nonparametric estimates of the geometric mean, and therefore comparable statistics to the "average" EMC values shown for the other pollutant groups) based on City of Los Angeles catch basin monitoring data, which could not be shown to correlate with land use or other census data studied. Rather, statistically significant differences could only be confirmed for the broad land use categories of "developed" and "undeveloped;" therefore only two different values are shown in the table above. For the Ballona Creek Watershed test application, directly measured trash loads (available as GIS shapefiles from the City of Los Angeles) may be used for the analysis. For non-City areas, if County trash sampling data is not available (i.e., actual monitoring data should be used preferentially), the median volumetric load per acre values shown in this table should be used. The precision of this trash dataset was to the nearest 1 cf/ac, with most of the results being either 0 or 1 cf/ac. The developed median value is 1 cf/ac and the undeveloped median is 0 cf/ac.

[11] Fecal coliform geometric mean summary statistics are based on Los Angeles County grab and composite-sampled land use runoff monitoring data, with a Maximum Likelihood Estimation (plus jackknifing) method applied to account for censored data (below and above detection limit results), assuming lognormal concentration distributions (Shumway et. al. 2002).

Fecal coliform was selected because it is a common bacteria standard for freshwater and ocean criteria. (Fecal coliform and E. coli are the basis for freshwater standards; fecal coliform, total coliform, and enterococcus serve as the bases for ocean criteria.)

[12] Lack of sufficient data did not allow for the discretization of high density single family (HDSF) residential land use data from that of the multi-family (MF) and mixed residential (combined) land use, so these fecal coliform EMC data were combined and utilized for all residential land uses.

b.5 **Calculate pollutant scores**. Compute pollutant CPI scores[13] for each land use for each pollutant, except trash[14], and then sum land use-specific pollutant loads for each catchment (see Figure 8 for conceptual diagram of computations) using either a load-based method (Method 1) or a concentration-based method (Method 2).

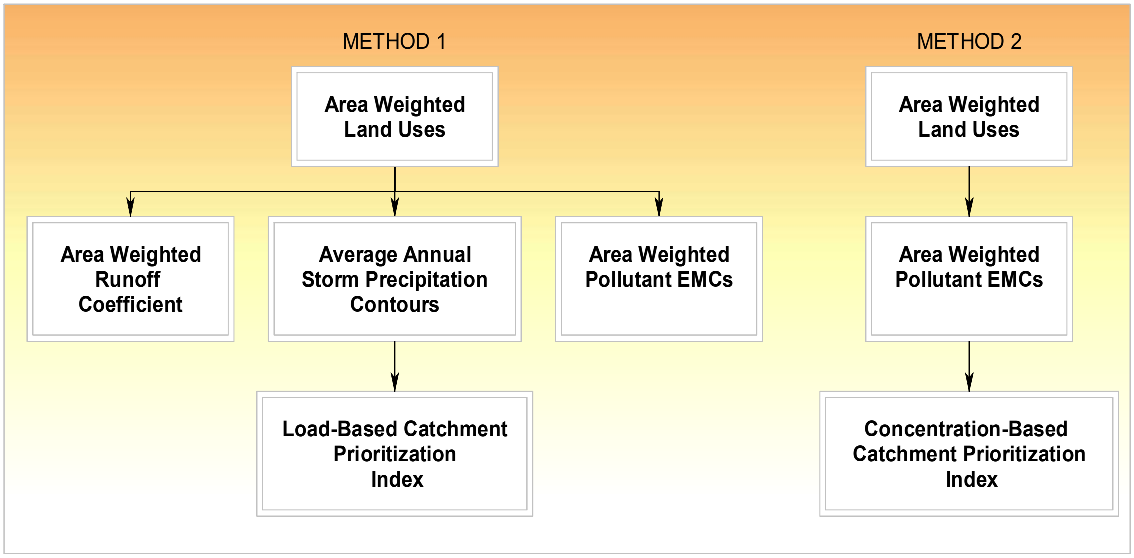

Figure 8. Load and concentration-based computation steps for CPI

Method 1

Method 1 uses EMCs, runoff coefficients, and rainfall intensity to determine the catchment priority index (CPI), a prioritization score on a scale from 1 to 5 with 5 being the highest priority. The County recommends using Method 1 when water quality data at the site indicates that the first flush phenomenon dominates pollutant loading in the area. Discussions of the data used to formulate Method 1, examples of Method 1 implementation in other contexts, and some limitations with use of the data are provided in Appendix F.

The load-based CPI calculation (Method 1) is consistent with UCLA, SCCWRP, and SMBRC stormwater quality studies (Stenstrom and Strecker, 1993; Ackerman and Schiff, 2003; GeoSyntec Consultants, 2005), as well as the City's GIS-based BMP planning tool (Sedrak and Murillo, 2005).

[13] It should be noted here that this step is not to be considered or used as pollutant load modeling or development of measures for TMDL compliance. While it is agreed that load modeling for TMDL compliance analysis is a needed effort, the purpose of this project is to prioritize stormwater retrofit opportunities to maximize water quality benefits. Accordingly, it focuses on the relative merits of opportunities, and not quantifiable improvements. However, this project is intended to be complementary to such future modeling and TMDL efforts.

[14] For trash, catchment pollutant scores should be based only on area-weighted EMCs since this load is not a function of rainfall or runoff coefficients.

Method 1 (load-based):

$$PCPI_x = \frac{\sum_y \left(EMC_{x,y} * RC_y * A_y * P\right)}{\sum_y A_y} \qquad \text{(Equation 1)}$$

Where:

$PCPI_x$ = load-based pollutant CPI for pollutant type "x" (e.g., nitrate, fecal coliform, total lead) for study catchment; note: Method 1 not applicable to trash as this EMC is in units of volume per area and therefore load is not a function of RC or P.

$EMC_{x,y}$ = Event Mean Concentration for pollutant x for land use type "y" (e.g., commercial, residential, industrial, open)

RC_y = Runoff coefficient for land use y

A_y = Total area for land use y in catchment (may involve summing areas of numerous disconnected polygon slivers)

P = Precipitation index value for study catchment

Method 2

Method 2 uses only the area-weighted EMC as the basis for prioritization, and may include the addition of a runoff coefficient component. The concentration-based CPI calculation (Method 2) was added at the County's request and compared to Method 1 in the Ballona Creek Watershed demonstration to evaluate the sensitivity of the Methodology to the CPI calculation approach. The County recommends Method 2 when water quality data shows a regenerative pollutant source affecting the study area. The assessment of this method in the Ballona Creek Watershed application revealed it to be an acceptable alternative. For further discussion on the basis for the Method 2 calculation approach, see the County's technical opinion memo included in Appendix F.

Method 2 (concentration-based):

$$PCPI_x = \frac{\sum_y \left(EMC_{x,y} * A_y\right)}{\sum_y A_y} \qquad \text{(Equation 2)}$$

Where:

$PCPI_x$ = concentration-based pollutant CPI for pollutant type "x" for study catchment

All other variables previously defined.

c. **Normalize and weight pollutant CPI scores**. In order for pollutant CPI scores (PCPI) to be comparable between catchments[15], they must be normalized by the maximum catchment pollutant score. The method allows the user to weight PCPI scores by pollutant type. Table 4

[15] The Methodology is not currently designed for multi-watershed prioritization planning or inter-watershed project comparison. However, if analysis is to be conducted for a multi-watershed study area, with CPI and BMP scores intended to be comparable between watersheds, then maximum pollutant scores *for entire study area* should be used to normalize pollutant load scores. Because implementation of this type of analysis has not been adequately tested, it cannot be recommended at this time. User may also wish to use maximum possible EMC, RC, and P values to compute a maximum theoretical load to normalize pollutant CPI scores so that they are comparable between watersheds.

reflects recommended pollutant weights. These pollutant weightings are based on stakeholder consensus on relative pollutant "importance". Alternative values may be selected by the user based on group priorities for the study watershed(s).

Table 4: Recommended Weights and Factors for CPI Calculation[16]

Candidate Catchment Factors	Max Points
1. Rank catchment by pollutant load per unit area (5 bins each)	**50**
Trash	10
Nutrients (Nitrate)	10
Bacteria (Fecal Coliform)	10
Total Metals (Total Cu, Total Pb, Total Zn)	15
Sediment (TSS)	5
2. Multiply pollutant score by 2 if a d/s impairment, by 3 if a d/s TMDL	**x2 or x3**
3. Add 5 points for each "other" impairment (bioaccumulation, toxicity, legacy pesticides, and ecological impacts)	**20**
Theoretical maximum catchment pollutant load score	**170**

c.1 Identify maximum PCPI (maxPCPI) in watershed and divide individual PCPIs by maxPCPI to create normalized PCPIs.

c.2 Weight normalized PCPIs. Round fractions up to the next highest integer value (See Table 4).

$$PCPI'_x = Roundup\left(\frac{PCPI_x}{\max PCPI_x} \cdot WF\right) \qquad \text{(Equation 3)}$$

Where:

$PCPI'_x$	= normalized pollutant CPI (LCPI or CCPI) for pollutant type "x" for study catchment
$PCPI_x$	= pollutant CPI for pollutant "x" for study catchment
max $PCPI_x$	= maximum $PCPI_x$ value for entire watershed for pollutant "x"
WF	= weight factor for pollutants (per Table 4, 10 for trash, nitrate, and fecal coliform; 5 for total copper, total lead, total zinc, and TSS)

See Example 1 for a demonstration of this pollutant load score calculation.

[16] Scoring and weights may be adjusted by the user.

EXAMPLE 1. CPI SCORE CALCULATION

Problem

For a 40-acre Ballona Creek tributary (mid-watershed) catchment comprised of 40% commercial and 60% HDSF residential land uses, compute the pollutant load score for total copper. Assume maximum catchment total copper load score for the watershed (needed for normalizing from pollutant load to pollutant load score) is equivalent to a 100% commercial catchment located in the 1.3" 85th-percentile rainfall zone.

Solution

1. Determine target precipitation index value (average 85th-percentile precipitation depth for catchment, see Figure 7). P = 1.2 in

2a. Compute CPIx using Method 1 (see Equation 1)

$$PCPI_x = \frac{\sum_y \left(EMC_{x,y} * RC_y * A_y * P\right)}{\sum_y A_y}$$

Where:

- EMCcopper,commercial = 18.8 ug/L, EMCcopper,residential = 14.7 ug/L,
- RCcommercial=0.61, RCresidential = 0.39,
- Acommercial = 16 ac, Aresidential = 24 ac

[(18.8 ug/L * 0.61 * 16 ac * 1.2 in) + (14.7 ug/L * 0.39 * 24 ac * 1.2 in)] / 40 ac = 9.63
(units to be normalized)

2b. If Method 2 is preferred, compute CPIx using Method 2 (see Equation 2)

$$PCPI_x = \frac{\sum_y \left(EMC_{x,y} * A_y\right)}{\sum_y A_y}$$

[(18.8 ug/L * 16 ac) + (14.7 ug/L * 24 ac)] / 40 ac = 16.3 ug/L

3. Repeat calculation for maximum condition (per example, this is 100% commercial land use, 1.3 in) to determine maximum catchment total copper load (needed for normalizing the score above).
maxPCPI = 100% * 0.61 * 1.3 in * 18.8 ug/L = 14.9
(If Method 2 is used, maxPCPI = 18.8 ug/L)

4. Normalize load (scale of 1-5) to compute catchment pollutant load score (PCPI).
(9.63/14.9) * 5 = 3.2
(If Method 2 is used (16.3/18.8)*5 = 4.3)

5. Report final total copper CPI score by rounding to next highest integer (i.e., report 1.2 result as 2).
3.2 → 4 (final total copper load-based pollutant CPI score, normal $PCPI_{copper}$)
4.3 → 5 (final total copper concentration-based pollutant CPI score, normal $PCPI_{copper}$))

d. **Account for "downstream" impairments and TMDLs**. Assign pollutant group impairments and TMDLs to each reach, based on the 303(d) and TMDL lists or other identified pollutants of concern as appropriate (see Appendix B) .[17] Using a hydrologic drainage network (a set of stream and/or drainage reaches that connect with directional to/from nodes; the network may be based on the actual drainage system or a simplified schematic representation), catchments upstream and downstream of each other can be easily identified in a GIS system. Reaches can then be linked to catchments by a spatial overlay, so that upstream catchments that eventually drain to an impaired reach can also be identified.[18] The following steps can be used to identify the "downstream" impairments and TMDLs.

d.1 To identify catchments that lie upstream of impaired and TMDL reaches, first identify impaired and TMDL reaches within the drainage network. This can be accomplished either visually or through a spatial join – any reaches within the drainage network that overlay a TMDL or impaired water body should be flagged as such. Each flagged TMDL or impaired reach should then be traced upstream within the network to identify all reaches that flow into the flagged reach. Identify upstream catchments based on a spatial join to the flagged upstream reaches, and then assign a value to the catchment based on the pollutant type of the impairment/TMDL (e.g., if a catchment is upstream of a reach with an existing TMDL for metals, it should receive a "true" value for a field created to identify TMDLs for metals, and no value if not).

d.2 Weights listed in Table 4 are recommended as follows. Multiply catchment's PCPI score by 2 if it drains to an impaired reach or by 3 if it drains to a reach with a completed TMDL for the given parameter group. This provides additional emphasis for catchments which drain to impaired water bodies or even more emphasis to those receiving waters with TMDLs. (These weightings are again based on stakeholder consensus. Alternative values may be selected by the user based on group priorities for the study watershed(s).) Note: a reach cannot trigger both multipliers; it is an either-or condition.

$$PCPI''_x = \begin{cases} PCPI'_x \times 2 & \text{if catchment drains to 303(d) listed impaired water body} \\ PCPI'_x \times 3 & \text{if catchment drains to TMDL water body} \end{cases} \quad \text{(Equation 4)}$$

Where:

$PCPI'_x$ = normalized pollutant CPI for pollutant type "x" for study catchment

$PCPI''_x$ = adjusted pollutant CPI for pollutant type "x" for study catchment

e. **Compute catchment-specific CPI.** To compute catchment-specific CPI, PCPIs are summed, other impairment factors are added, and CPI scores are normalized.

e.1 Sum CPIs

- Other impairments may exist that are not directly associated to a single pollutant type (such as toxicity). Therefore, for each catchment, add all of the adjusted pollutant CPI scores plus additional impairment points (IP) for each additional "other" downstream impairment. IP is

[17] "Downstream" impairments include estuaries, but not beaches near watershed outlets.

[18] Note that this step requires Network Analyst extension to ArcGIS.

equal to 5 points as recommended in Table 4, but these values can be adjusted by the user. These "other" impairments include:

- Bioaccumulation
- Toxicity
- Legacy pesticides
- Ecological impacts

Calculate un-normalized CPI as follows (steps e.1 and e.2).

$$CPI = \sum_x PCPI''_x + (IP \cdot N) \qquad \text{(Equation 5)}$$

Where:

CPI = preliminary (un-normalized) CPI for study catchment

$PCPI''_x$ = adjusted pollutant CPI for pollutant type "x" for study catchment

IP = Impairment points = 5 (per Table 4)

N = number (1, 2, 3, or 4) of "other" downstream impairments for study catchment (bioaccumulation, toxicity, legacy pesticides, and/or ecologic impacts)

e.2 Normalize cumulative CPI values by again scaling to maximum CPI, then multiply by 5 to generate final normalized CPIs for all catchments, with results ranging from 1-5 (note that because CPI results are scaled relative to maximum value – rather than ranking and assigning to bins by percentile – there will be bins with more or fewer catchments than others).

$$CPI' = Roundup\left(\frac{CPI}{\max CPI} \cdot 5\right) \qquad \text{(Equation 6)}$$

Where:

CPI' = normalized CPI for study catchment

CPI = preliminary (un-normalized) CPI for study catchment

max CPI = maximum CPI score for watershed

Example 2 below demonstrates this scoring calculation for a hypothetical catchment. When completing these calculations for all catchments, this step results in a CPI map for the watershed. Figure 9 is an example normal load-based CPI map for the Ballona Creek Watershed.

EXAMPLE 2. CPI CALCULATION

Problem

Compute the Catchment Prioritization Index (CPI) for a 40-acre Ballona Creek (mid-watershed) catchment comprised of 40% commercial and 60% HDSF residential land uses, assuming the following normalized pollutant load scores. Assume downstream impairments and completed TMDLs for trash, bacteria, and metals. Also assume "other" downstream estuary impairments for bioaccumulation, toxicity, and legacy pesticides.

Assume following normalized CPI scores: trash (7), nitrate (3), total copper (3), total lead (4), total zinc (1), fecal coliform (7), TSS (2).

Solution

1. Determine total pollutant load score (per Table 4) by weighting by impairments (x2) and completed TMDLs (x3).

$$7*3 + 3*1 + 3*3 + 4*3 + 1*3 + 7*3 + 2*1 = 71$$

2. Determine "other" impairments score.

$$3*5 = 15$$

3. Compute total Catchment Prioritization Index for catchment.

$$71 + 15 = 86$$

4. Scale CPI (1-5) by normalizing to maximum possible CPI score (170), then rounding up to the next highest integer.

$$(86/170)*5 = 2.5$$

CPI score = 3

f. **Compute Nodal CPI Scores:**

To account for regional BMPS opportunities that might existing downstream of high priority catchments, a Nodal CPI score is calculated. Downstream regional opportunities are defined here as high regional BMP score catchments (see Step 2 for BMP score calculation method) that are located "downstream" (based on the stormdrain network) of a group of higher-priority catchments. In order to then prioritize these downstream opportunities (again based on pollutant load, as with the CPI approach), the concept of a *nodal CPI* was developed, in which a catchment node is assigned a new nodal CPI score based on the area-weighted average CPI score of the upstream catchments. This calculation approach is described below.

f.1 Using the hydrologic drainage network described above, identify catchments tributary to each network node and calculate an area-weighted average CPI score for that node. Example 3 demonstrates how nodal CPI scores are computed.

$$Nodal\ CPI = \frac{CPI' \times A + \sum_u \left(CPI'_u \times A_u\right)}{A + \sum_u A_u} \qquad \text{(Equation 7)}$$

Where:

Nodal CPI = nodal CPI for study catchment
CPI' = normalized CPI for study catchment
CPI'_u = normalized CPI for upstream catchment "u"
A, A_u = area of study catchment and of upstream catchment "u", respectively

f.2 Round average CPI values to the nearest integer and assign each catchment the rounded CPI value of its associated outlet node. This step results in a Nodal CPI map of the watershed. Figure 10 is an example load-based nodal catchment prioritization index (CPI) map for the Ballona Creek Watershed.

EXAMPLE 3. NODAL CPI CALCULATION

Problem

The 40-acre catchment of Example 2 drains to a point (node) of the drainage network that receives runoff from four other upstream catchments. These upstream catchments have areas of 25, 30, 50, and 65 acres and were assigned CPI scores of 5, 3, 4, and 5, respectively. Compute the nodal CPI score for the 40-acre catchment.

Solution

1. Calculate the area-weighted CPI score for the node receiving direct discharge from the 40-acre catchment, which was assigned a CPI score of 3, as shown in Example 2.

$$(40*3 + 25*5 + 30*3 + 50*4 + 65*5)/(40 + 25 + 30 + 50 + 65)= 4.1$$

2. Round to the nearest integer and assign this nodal CPI score to the catchment.

Nodal CPI score = 4

PRODUCT OF STEP 1:

Create CPI and Nodal CPI maps for the watershed utilizing the analysis results from the Step 1 analysis. The maps should be color coded by CPI score. These watershed maps should facilitate a big-picture review of the number and location of high priority catchments in the watershed. Figures 9 and 10 are example maps for the Ballona Creek Watershed.

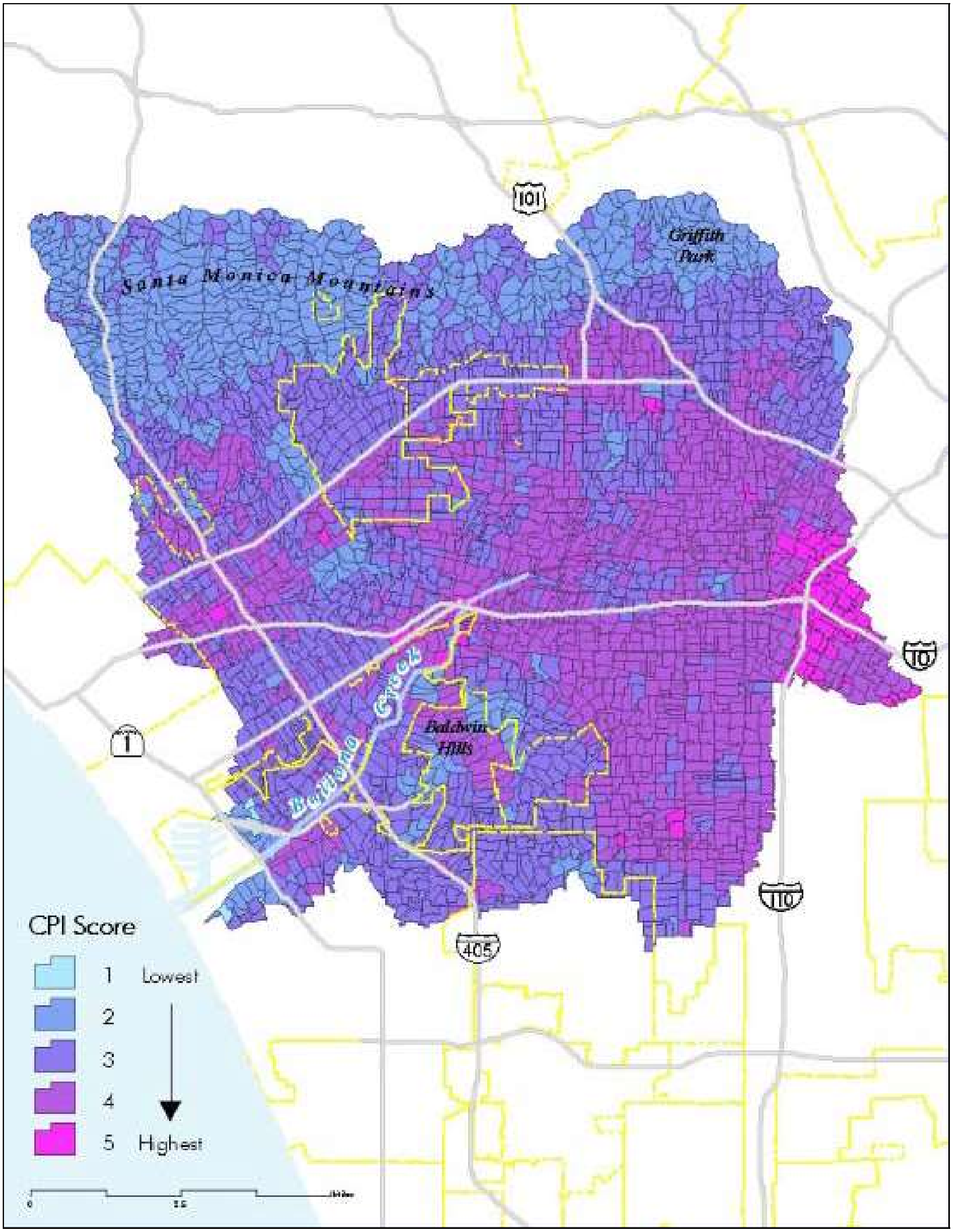

Figure 9. Example of a CPI map for the Ballona Creek Watershed

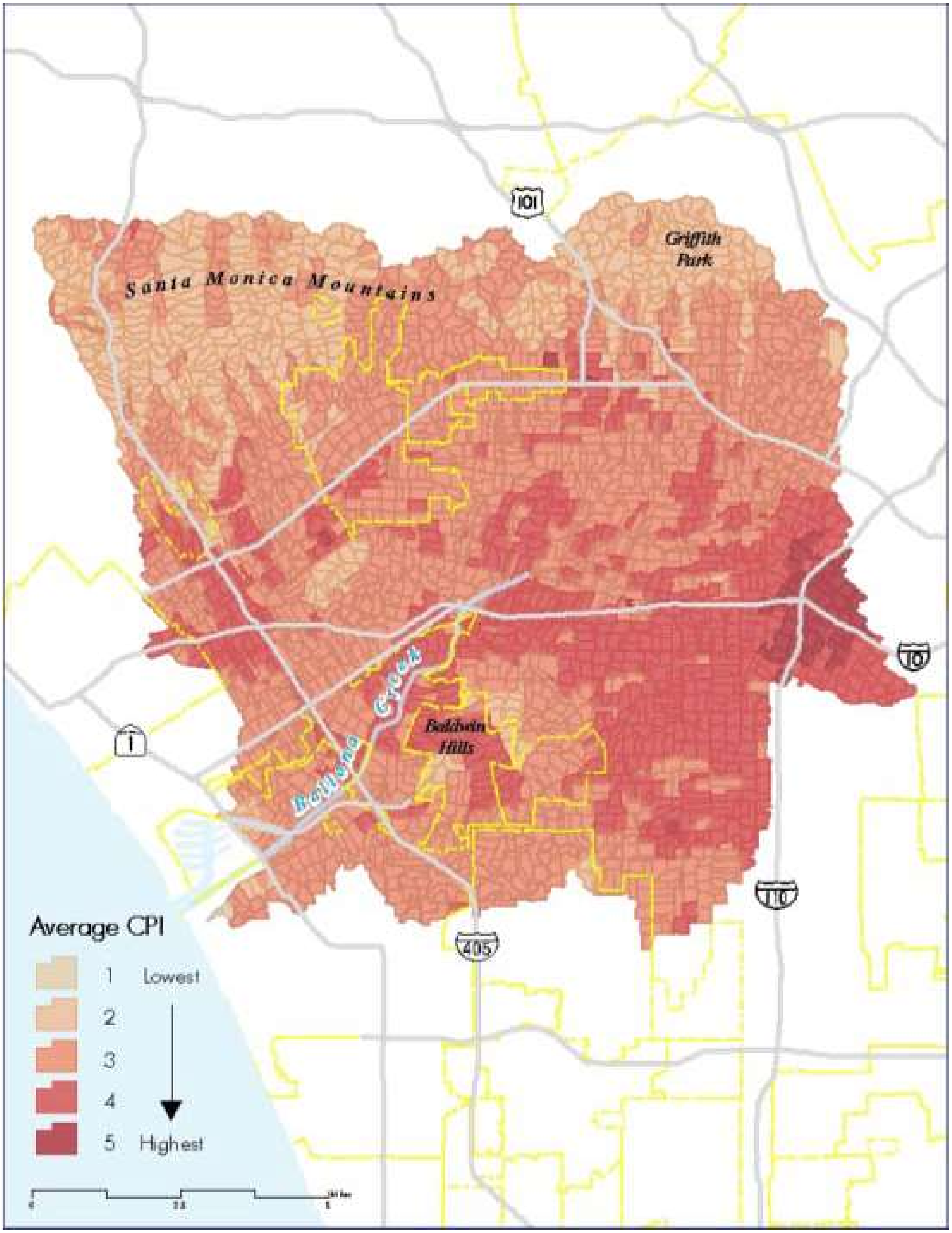

Figure 10. Example of a Nodal CPI map for the Ballona Creek Watershed

Attachment Y

Additional RAA Output

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Contents

Figures

Tables

1 INTRODUCTION

As a component of the LARWQCB's review of the EWMP, additional information from the Reasonable Assurance Analysis (RAA) was requested regarding baseline calculations and predicted BMP performance. In response, this appendix contains additional information and RAA outputs, as follows:

- Section 2: Additional outputs regarding baseline model calibration
- Section 3: Additional outputs regarding predicted end-of-pipe best management practice (BMP) performance
- Section 4: Additional outputs through a regional validation example demonstrating attainment of instream receiving water limits (RWLs) by BMPs

2 BASELINE CONDITION

RAA Modeling Comment #1 of the RAA Comment Enclosure requested additional information regarding the baseline hydrology and water quality calibration metrics. The following additional hydrology and water quality comparisons are presented:

- Hydrology - Comparisons of modeled vs. observed streamflow compared against flow samples collected coincident with the mass emission station S28. Comparison focuses on the wet-weather metrics of *Highest 10% of Flows* and *Annual Storm Volume* (Table 2-1).
- Water Quality – Comparisons of modeled vs. observed event mean concentrations (EMCs) sampled at mass emission station S28. Water quality observations at S28 include both wet and dry weather event-mean concentrations (EMCs) for a number of pollutants, including the modeled constituents (sediment, Cu, Pb, Zn, E. coli, N, and P). For each storm event, modeled hourly flows and loads at the modeled stream outlet corresponding to S28 (Reach 2042) were aggregated as individual EMCs, and compared against the reported EMC sampled over the same reporting period (Table 2-2).

Table 2-1. Assessment of baseline hydrology model calibration at S28

Location	Model Period	Hydrology Parameter	Modeled vs. Observed	RAA Guidelines Performance Assessment[1]
Mass Emission Station (S28)	10/17/2004 to 9/22/2011	Highest 10% Flow	-7.7%	Very Good
		Annual Storm Volume	0.0%	Very Good

1: Numerical targets from: Regional Board (2014) *Guidelines for Conducting Reasonable Assurance Analysis in a Watershed Management Program, Including an Enhanced Watershed Management Program.*

Table 2-2. Assessment of baseline wet-weather water quality model calibration at S28

Pollutant	Units	Wet-Weather Flow-Weighted Average EMCs Common Period: 10/17/2004 to 9/22/2011				Narrative Assessment[1]
		No. Events	Observed	Modeled	Relative Mean Error	
Copper	ug/L	27	78	52	-34%	Fair
Lead	ug/L	27	31	13	-58%	Poor[2]
Zinc	ug/L	27	352	213	-40%	Fair
Total-N	mg/L	27	3	4	16%	Good
Total-P	mg/L	27	0.39	0.34	-13%	Very Good
TSS	mg/L	57	181	166	-8%	Very Good
Fecal Coliform	MPN/100mL	26	173,661	739,429	326%	Poor[3]

1: Narrative assessment based on RME ranges from: Regional Board (2014) *Guidelines for Conducting Reasonable Assurance Analysis in a Watershed Management Program, Including an Enhanced Watershed Management Program*

2: Data analysis from the Dominguez Channel EWMP identified zinc as the limiting pollutant, meaning that managing zinc ensures compliance for other metals including lead; therefore, model calibration error for lead is inconsequential.

3: The management target for bacteria is full retention of the critical condition runoff event (i.e. 90th percentile 11th wettest day); therefore, model calibration error for bacteria is inconsequential.

3 BMP PERFORMANCE: ADDITIONAL OUTPUTS

RAA Modeling Comment #4 of the RAA Comment Enclosure requested model results be presented for both the baseline condition and the post-EMP (managed) scenario with the proposed BMPs. The model results are summarized below by assessment area, as follows:

- Runoff under baseline and BMP scenarios for the 90th percentile, 11th wettest day bacteria critical condition after excluding High Flow Suspension (HFS) days (Table 3-1)
- Runoff and pollutant load under the baseline and BMP scenarios for the 90th percentile total phosphorous critical condition (Table 3-2)

Table 3-1. Baseline Runoff and BMP Retention for Assessment Areas during Bacteria Critical Condition

Assessment Area	Baseline Runoff during 90th percentile, 11th day after HFS (acre-feet)	Runoff with BMPs during 90th percentile, 11th day after HFS (acre-feet)
Dominguez Channel	3.5	0.0
Dominguez Channel Estuary	342.0	0.0
Los Angeles Harbor	25.0	0.0
Machado Lake	8.2	0.0
Wilmington Drain	3.5	0.0
Upper Los Angeles River	8.1	0.0

Table 3-2. Baseline and BMP Scenario for Runoff and Pollutant Loads during Total Zinc Critical Condition

Assessment Area	Scenario	Runoff Volume (ac-ft)	*E. coli* (MPN)	Total Lead (lbs)	Total Zinc (lbs)	% Total Zinc Reduction
Dominguez Channel	Baseline	756.0	9.3E+15	32.0	517.1	86.8%
	with BMPs	216.1	2.6E+15	4.1	68.4	
Dominguez Channel Estuary	Baseline	614.6	1.2E+16	21.4	401.2	87.6%
	with BMPs	169.8	3.2E+15	2.4	49.6	
Los Angeles Harbor	Baseline	374.7	6.1E+15	9.9	197.3	84.1%
	with BMPs	137.1	2.1E+15	1.5	31.3	
Machado Lake	Baseline	117.5	1.5E+15	4.4	73.2	10.1%
	with BMPs	105.8	1.3E+15	4.0	65.8	
Wilmington Drain	Baseline	160.6	1.8E+15	6.8	108.3	49.6%
	with BMPs	84.8	1.0E+15	3.4	54.6	
Upper Los Angeles River	Baseline	8.9	2.5E+14	0.2	5.6	77.2%
	with BMPs	3.2	8.6E+13	0.1	1.3	

4 REGIONAL VALIDATION EXAMPLE

The LARWQCB requested a proof/validation/demonstration that managing the exceedance volume for the limiting pollutant using the recommended EWMP BMPs results in instream attainment of RWLs. It is important to note that volume-and-load-reduction targets are determined at the *beginning* of the Reasonable Assurance Analysis (RAA) process (and through the limiting pollutant analysis), and thus the extra step at the end of the RAA process to show validation results is optional. However, it is understood that a clear validation may be useful for engaging the public and LARWQCB staff during future discussion.

The RAA for the Dominguez Channel Watershed Management Group (DCWMG) employs a two-tiered optimization approach that manages stormwater runoff from EWMP areas according to critical conditions for associated water bodies (or assessment areas). For metals or nutrients, the management target becomes the load reduction that achieves receiving water limitations (RWLs) during the critical storm that produces the 90th percentile Exceedance Volume. The following EWMPs used this two-tiered optimization approach for selecting Best Management Practices (BMPs) for their implementation plans:

- Upper Santa Clara River (USCR),
- Upper Los Angeles River (ULAR),
- Ballona Creek (BC),
- Upper San Gabriel River (USGR),
- Malibu Creek (MC), and
- Dominguez Channel Watershed Management Group (DCWMG)

In order to support future discussions, this section provides an example regional validation for a representative example waterbody within Los Angeles County: Puente Creek, a tributary to San Jose Creek in the San Gabriel River Watershed. This regional validation example is attached to each of the six "selected EWMPs" listed above, and this sections presents several comparisons between the Puente Creek watershed and the selected EWMPs, based on averaged conditions *across all six* of those EWMP areas. The selected EWMP areas summarized in Table 4-1 represent the land use distribution within the 6 EWMP groups mapped in Figure 4-1. The areas in Table 4-1 represent the total MS4 areas for which the two-tiered optimization approach was used. Average rainfall within the selected EWMP areas was calculated by area-weighting 25 years of hourly rainfall from 111 unique rainfall gages from over 1,442 WMMS subwatersheds. Average rainfall for Puente Creek was calculated by area-weighting 25 years of rainfall from 2 rainfall gages over eight WMMS subwatersheds. Area-normalized rainfall depths were then plotted and compared (Figure 4-2 and Figure 4-3).

Puente Creek was selected for this demonstration because:

- Puente Creek has high required zinc reductions, providing a conservative demonstration of modeled BMP performance.
- Puente Creek is a watershed where 100% of the watershed area is contained within the EWMP boundary (Figure 4-1).

The land use distribution is Puente Creek is generally more urbanized than the land use distribution in the other selected EWMP areas mentioned above (see

- Table 4-1). Compared to the average distribution in the selected EWMP areas, the Puente Creek watershed has more urban area (93% vs. 55%). The distribution of Commercial, Institutional, Industrial, and Roads is similar; however, Puente Creek has nearly twice as much residential area (expressed as pervious and impervious residential land cover).
- Average rainfall in Puente Creek is very similar to average rainfall throughout the selected EWMP areas. Figure 4-2 shows annual average rainfall distribution for 25 years in Puente Creek watershed vs. selected EWMP areas. Figure 4-3 also confirms that seasonal variability in Puente follows the average seasonal trend in the selected EWMP areas. The percent difference in annual average and median rainfall in Puente Creek verses selected EWMP areas over 25 years of record is only 1.4% and 3.8%, respectively.
- The RAA for Puente Creek recommended a mix of LID, Green Streets, and Regional BMPs, which collectively treat 78% of the EWMP area.

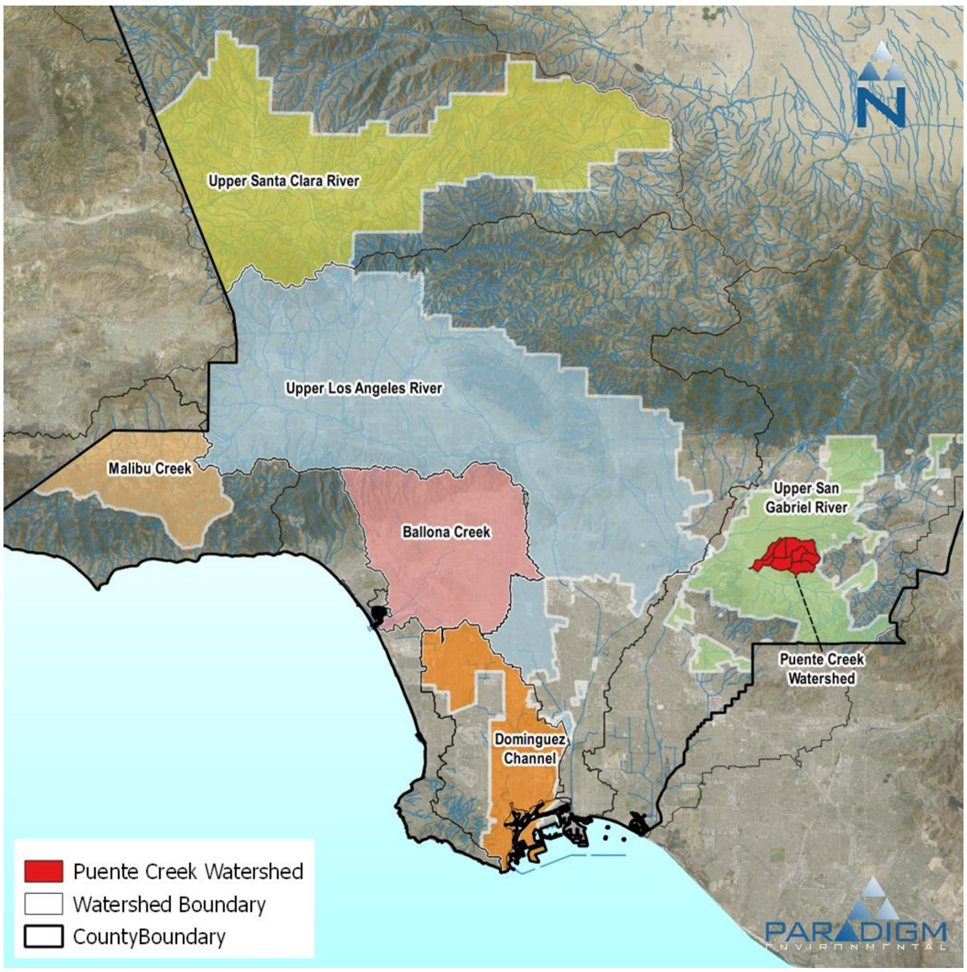

Figure 4-1. Location of Puente Creek watershed within the context of selected Los Angeles County EWMPs.

Table 4-1. Comparison of land use distribution in the Puente Creek EWMP area vs. selected EWMP areas

Land Use		Land Use Distribution[1] by Drainage Area			
		Selected EWMP Areas[2]		Puente Creek Watershed	
		Acres	Percent	Acres	Percent
Impervious	Residential	81,701	10%	1,044	19%
	Commercial	26,250	3%	226	4%
	Institutional	16,163	2%	231	4%
	Industrial	31,467	4%	277	5%
	Roads	60,793	7%	467	9%
Urban Pervious		236,137	29%	2,762	51%
Non-Urban Pervious		363,182	45%	398	7%
Total		**815,692**	**100%**	**5,405**	**100%**

1: Color gradient shows relative land use distribution from least (white) to greatest (red)
2: Selected EWMP areas include: USCR, USGR, ULAR, BC, Malibu, and portions of DC

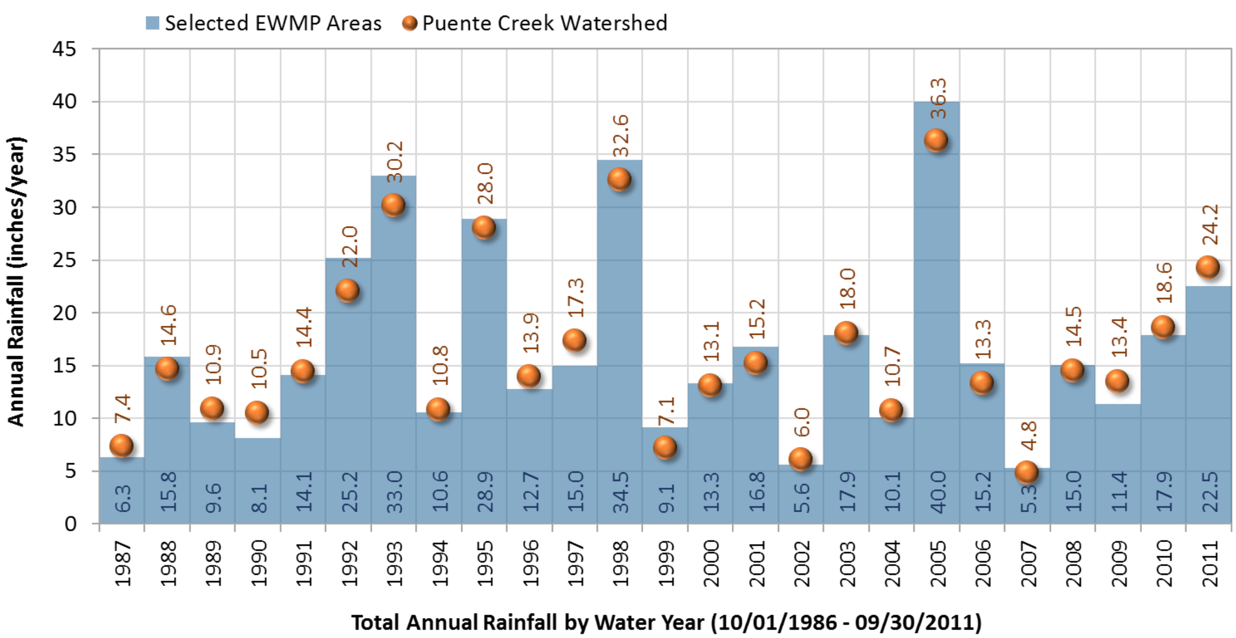

Figure 4-2. Annual rainfall distribution (25 years) in Puente Creek watershed vs. selected EWMP areas.

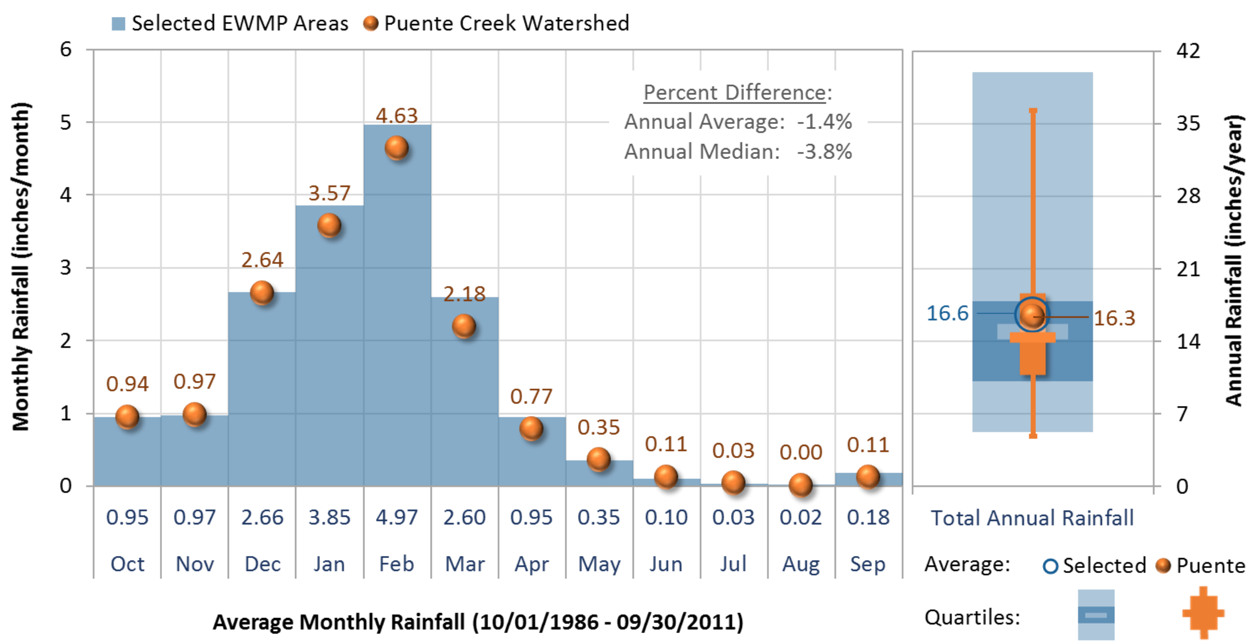

Figure 4-3. Monthly and annual rainfall variability in Puente Creek watershed vs. selected EWMP areas.

4.1 Validation Methodology

RAAs for the selected EWMPs were built on the two primary models within WMMS: the Loading Simulation Program in C++ (LSPC), which is used for watershed runoff and streamflow routing; and SUSTAIN, which is used for BMP selection and placement optimization modeling. As shown in Figure 4-4, to conduct the RAA and complete the validation, the modeling workflow includes (1) simulating watershed rainfall-runoff and pollutant loading; (2) predicting performance of BMPs with fixed assumptions and cost-optimize the cumulative network of BMPs given available BMP opportunities; and (3) validating the selected BMP network to provide reasonable assurance of attainment of RWLs.

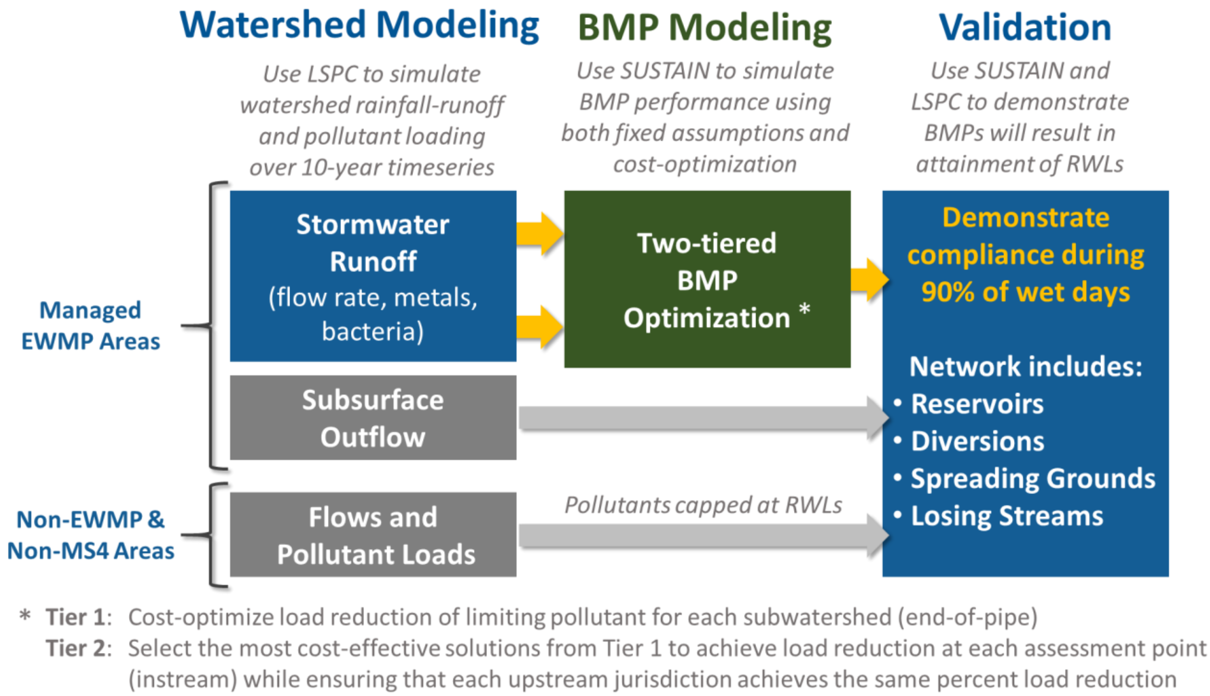

Figure 4-4. Components of the RAA Modeling Process.

4.2 Watershed Model Configuration

The watershed model simulates stormwater runoff and routing/transport for flow and pollutant loads. Subwatershed outflow includes surface and subsurface contributions. Stormwater BMPs manage the surface runoff portion of subwatershed outflow. As described in the RAA sections of the EWMPs, results from 10-years of continuous simulation were used to identify the limiting pollutant's critical condition (i.e. 90th percentile zinc Exceedance Volume) and the required load reduction associated with that critical condition. Although critical conditions are determined instream, associated runoff and loadings originate from multiple subwatersheds and jurisdictions.

An important aspect of the RAA is that load reductions within an assessment area are equitably distributed among jurisdictions contributing to the exceedance. For this reason, the original WMMS subwatersheds were further subdivided into jurisdictions. As described in the RAA sections of the selected EWMPs, all jurisdictions draining to a given assessment point were held to the same percent reduction. Figure 4-5 shows the original WMMS and updated RAA subwatershed routing networks for Puente Creek for the four contributing jurisdictions. The zinc critical condition in Puente Creek required a 76% instream load reduction—for equitability, all jurisdictions are required to each achieve a 76% load reduction collectively within their respective areas that drain to Puente Creek.

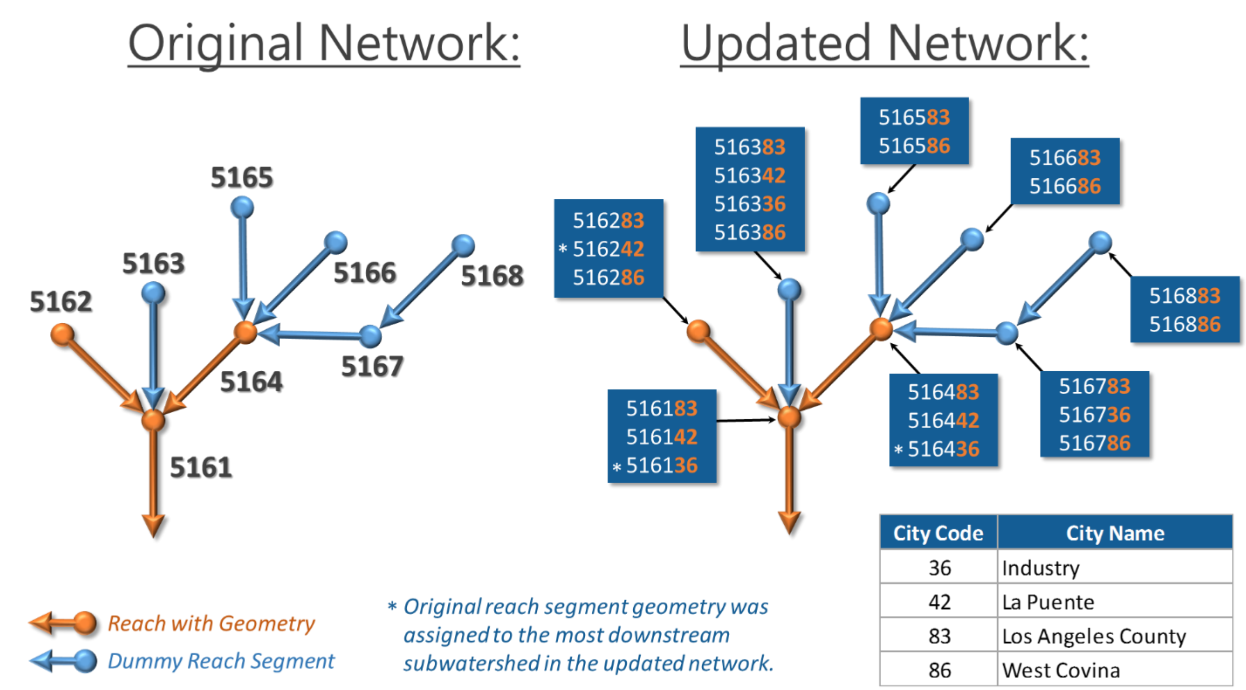

Figure 4-5. Original WMMS vs. RAA subwatershed modeling network for Puente Creek with contributing jurisdictions.

As previously shown in Figure 4-4, individual subwatershed contributions are separated into surface runoff and baseflow. Surface runoff from EWMP areas within Puente Creek were exported from the watershed model and used as boundary conditions for BMP modeling. Validation is performed by replacing baseline runoff in the watershed model with BMP effluent from the EWMP implementation plan. Subsurface flows and any other contributions from non-EWMP areas were also identified in the baseline model for accounting purposes. Non-EWMP areas were not managed by EWMP BMPs but it is important to account for impact of non-EWMP areas on the validation, as further described in Section 0.

4.3 BMP Model Configuration

SUTAIN was used to identify the most cost-effective combination of management practices in each subwatershed that collectively achieved a 76% zinc load reduction in each jurisdiction. Figure 4-6 shows the most cost-effective distribution of BMP capacity by BMP type (LID, green streets, and regional BMPs). Table 4-2 summarizes the detailed recipes for compliance for the four jurisdictions within the Puente Creek assessment area. For this exercise, the validation is focused on zinc RWL attainment and thus the BMPs associated with the 2026 metals attainment milestone were included in the model to validate RWL attainment for metals.

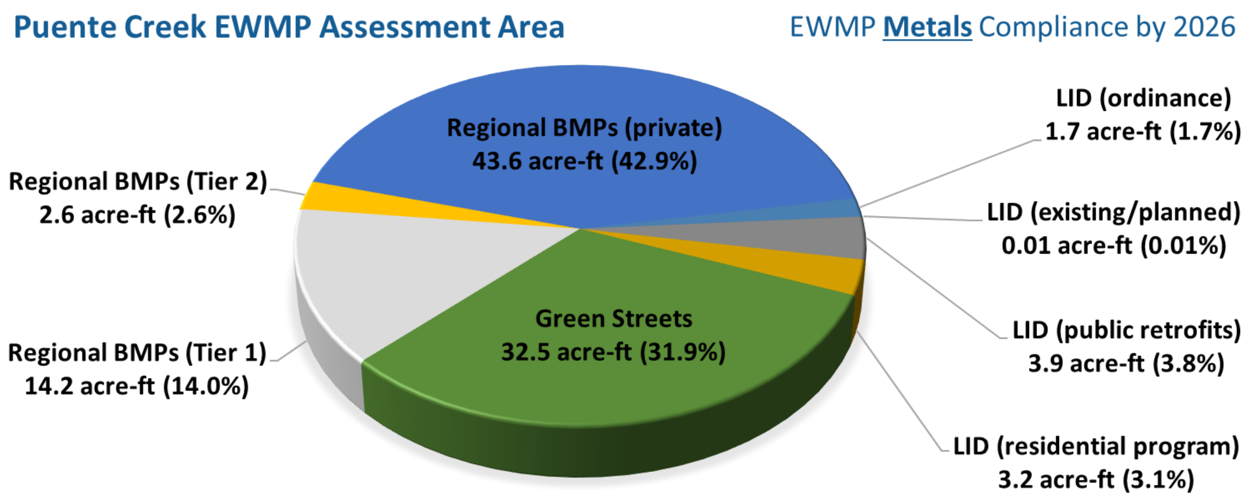

Figure 4-6. BMP capacities for metals compliance in the Puente Creek watershed.

Table 4-2. Detailed recipe for Metals TMDL compliance by jurisdiction for the Puente Creek Watershed

EWMP Implementation Plan Component			Optimized Capacity by Jurisdiction (acre-ft)			
			Industry	La Puente	Los Angeles County	West Covina
For Metals Attainment by 2026	24-hour Volume Managed		14.28	28.71	48.58	21.14
	LID	Ordinance	0.43	0.42	0.77	0.09
		Planned LID	---	---	0.01	---
		Public LID	0.14	0.42	3.27	0.05
		Residential LID	0.01	0.86	2.07	0.23
	Green Streets		0.98	9.00	17.62	4.85
	Regional	Tier 1 (public, owned)	---	10.92	3.31	---
		Tier 2 (public, owned)	0.81	0.03	---	1.78
		Tier 2 (public, non-owned)	---	---	0.00	---
		Private	6.82	10.52	15.42	10.8
	Total BMP Capacity		**9.19**	**32.18**	**42.48**	**17.8**

4.4 Routing Configuration between Watershed and BMP Models for Validation Example

The validation process involved deconstructing and reconstructing the watershed model within the Puente Creek assessment area. A step-by-step sequence of tests were performed to systematically layer the components, verifying for expected outcomes from test cases at each step in the process. The steps include:

1. **Establish baseline (original subwatershed network)**: run the baseline watershed model (with the original 8-subwatershed network), which serves as the primary reference point for validation.
2. **Confirm baseline (updated subwatershed network)**: run the updated baseline watershed (with the updated jurisdiction-based network with 22 subwatersheds) and verify that flow and water quality matches results from Step 1.
   a. **Establish EWMP baseline**: separate runoff into EWMP and non-MS4 timeseries. Non-MS4 areas are assumed to be managed by other means to achieve the RWL. This ensures that non-EWMP areas do not contribute to exceedances at the assessment point. Thus, the concentrations of zinc from non-MS4 areas are "capped" at the RWL to prevent the non-MS4 areas from causing or contributing to RWL exceedances.
3. **Confirm optimized BMP solution**: combine baseline LSPC and SUSTAIN BMP model runs
   a. Route 10 years of baseline continuous simulation runoff from LSPC through the selected EWMP BMPs to generate timeseries of treated runoff.
   b. Replace baseline timeseries in the watershed with treated BMP effluent from SUSTAIN. That is, the timeseries of concentration and flow rate in the effluent from the selected BMP solution for each assessment area was inserted back into the watershed model (LSPC) and routed through the reach network.
   c. Run the updated watershed model to generate 10-years of runoff and instream pollutant concentrations at the outlet of Puente Creek with BMPs implemented.
4. **Process Validate Output**: sort and plot 10-years of zinc *wet-weather* concentrations for each of the three model runs listed below.
   a. Baseline model for Puente Creek (output from Step 1)
   b. EWMP baseline model with non-MS4 area capped at RWL (output from Step 2)
   c. BMP solution model run (output from Step 3)
5. **Validate Results**: Present the three percentile plots from Step 4 on a graph, along with the RWL. Demonstrate that the BMP solution model run achieves the RWL at the 90^{th} percentile threshold for the modeled 10-year period.

4.5 Results and Conclusions

Per Steps 4 and 5 of the validation process described above, the 10-year record was analyzed to validate that RWLs were attained on 90% of wet weather days. Figure 4-7 presents baseline timeseries verses EWMP-implemented (BMP solution model run) time series for flow and zinc concentration in Puente Creek. The successful validation outcome (for Puente Creek) is shown in Figure 4-8. The 90th percentile wet weather concentration of total zinc at the mouth of Puente Creek is compared to the RWL. Three different conditions are shown in Figure 4-8, as follows:

1. Baseline/existing condition ("Baseline", blue line)
2. Baseline condition with zinc concentrations capped at RWLs for runoff from non-MS4 and non-EWMP areas ("Baseline for EWMP MS4s", green line)
3. Condition after BMPs specified by the RAA are implemented ("EWMP implemented", orange line).

Validation is demonstrated by the outcome that the 90th percentile concentration at the mouth of Puente Creek is less than the zinc RWL. This validation is representative of each of the selected EWMPs including USCR.

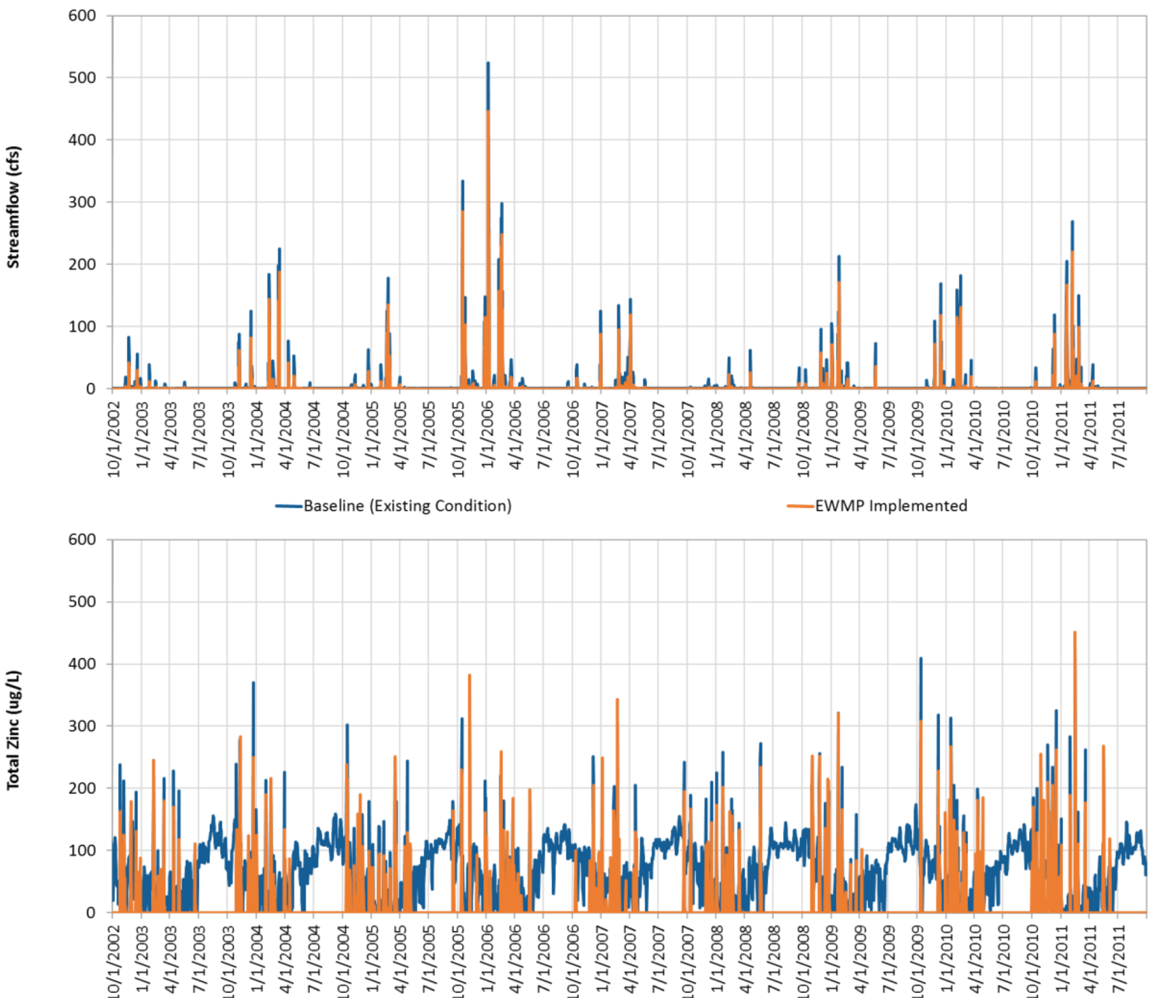

Figure 4-7. Instream validation 10-years timeseries plot demonstrating attainment of RWLs (Puente Creek).

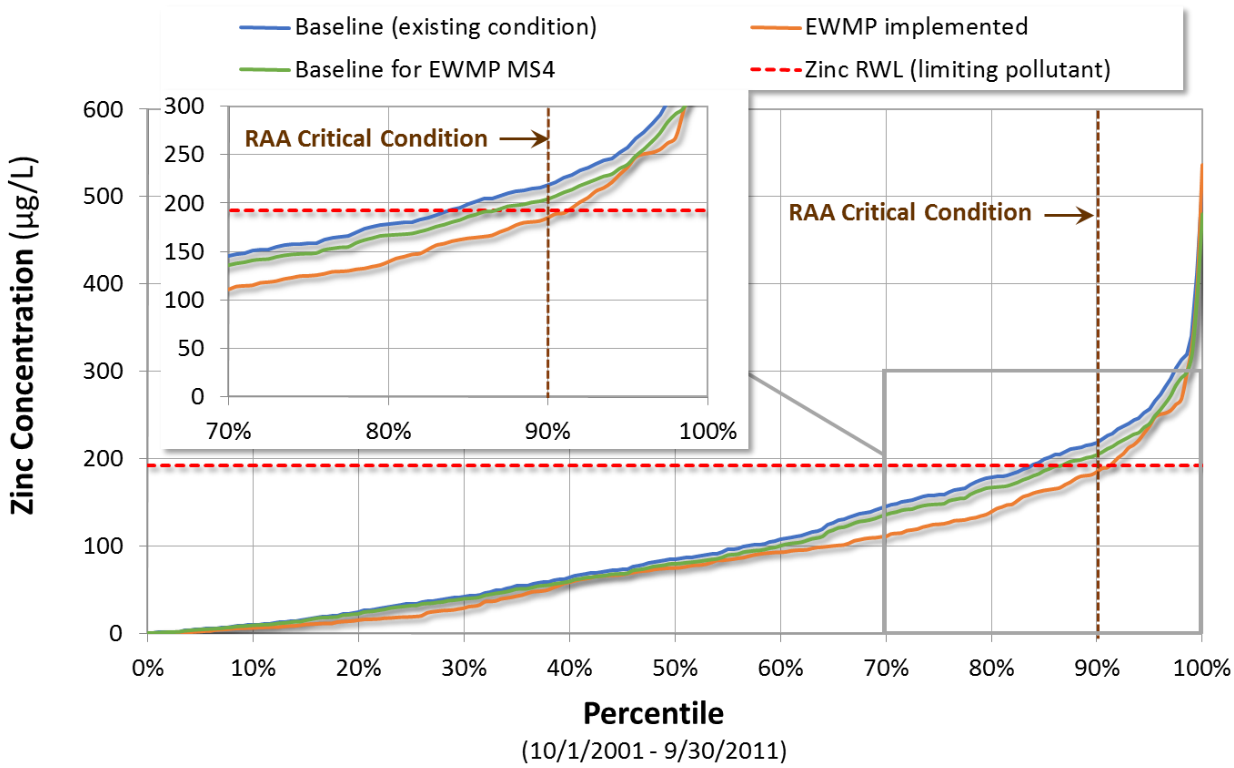

Figure 4-8. Instream validation plot demonstrating attainment of RWLs (Puente Creek).

Addendum to Enhanced Watershed Management Program for the Dominguez Channel Watershed Management Area Group:

Incorporation of City of Carson

FEBRUARY 12, 2016

PREPARED FOR:

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Contents

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Tables

1 INTRODUCTION

This appendix presents an addendum to incorporate the City of Carson (Carson) into the Enhanced Watershed Management Program for the Dominguez Channel Watershed Management Area Group (DC EWMP). The draft DC EWMP submitted in June 2015 by the Dominguez Channel Watershed Management Area Group (DC WMG) included the cities of Los Angeles, El Segundo, Hawthorne, Inglewood, and Lomita and the County of Los Angeles and the Los Angeles County Flood Control District (LACFCD). On August 26, 2015 the city of Carson provided a Notice of Intent to join the DC EWMP to the Los Angeles Regional Water Quality Control Board (Regional Board).[1] This addendum provides the analysis needed to fully incorporate Carson into the DC EWMP and presents the EWMP Implementation Plan for Carson. Through submittal of this addendum, Carson will receive the compliance benefits provided by the MS4 Permit for jurisdictions that develop Enhanced Watershed Management Programs. The revised extent of the DC WMG is presented in Figure 1-1 after the incorporation of the cities of Lawndale and Carson. Shown in Table 1-1 is a summary of the relative jurisdictional areas after incorporation of Lawndale and Carson into the DC WMG, and Figure 1-1 shows the jurisdictional boundaries of the DC WMG and the major tributary/assessment areas for the DC EWMP. Table 1-2 is a summary of the relative areas in Carson that drain to the major receiving waters.

This addendum is focused on the Carson-specific analyses to incorporate the City of Carson into the DC EWMP, including the portion of Carson within the Los Angeles River watershed. When possible, the reader is referred to the DC EWMP for details on methodology and analyses that apply to the entire DC EWMP Group. To support review of this document, the format and organization of this addendum follows the DC EWMP. When a cross-reference within this addendum refers to a section of the main body of the DC EWMP, the reference includes “of the DC EWMP.” Otherwise, the cross-reference is referring a section within this addendum.

[1] The City of Lawndale submitted an NOI on August 12, 2015 and is incorporated through a separate addendum.

Table 1-1. Summary of DC WMG Member Jurisdictional Areas

DC WMG Member	Total Area (acres)	Percent of Group [2]
City of Carson	11,942.9	23.5%
City of El Segundo [1]	1,252.2	2.5%
City of Hawthorne [1]	3,891.9	7.7%
City of Inglewood [1]	3,884.3	7.6%
City of Lawndale	1,259.5	2.5%
City of Lomita [1]	1,227.7	2.4%
City of Los Angeles [1]	19,177.3	37.8%
Los Angeles County [1]	8,140.9	16.0%
LACFCD	n/a	n/a
Total	**50,776.7**	**100.0%**

1: Total area as presented in Section 1 of the DC EWMP
2: Percent of Group re-calculated based on total area after including the Cities of Carson and Lawndale

Table 1-2. City of Carson area distribution by Assessment Area

Assessment Area	Total Area (acres)	Percent of Total
Dominguez Channel Estuary	10,555.3	88.4%
Machado Lake	560.8	4.7%
Wilmington Drain	657.7	5.5%
Compton Creek	169.1	1.4%
Total	**11,942.9**	**100.0%**

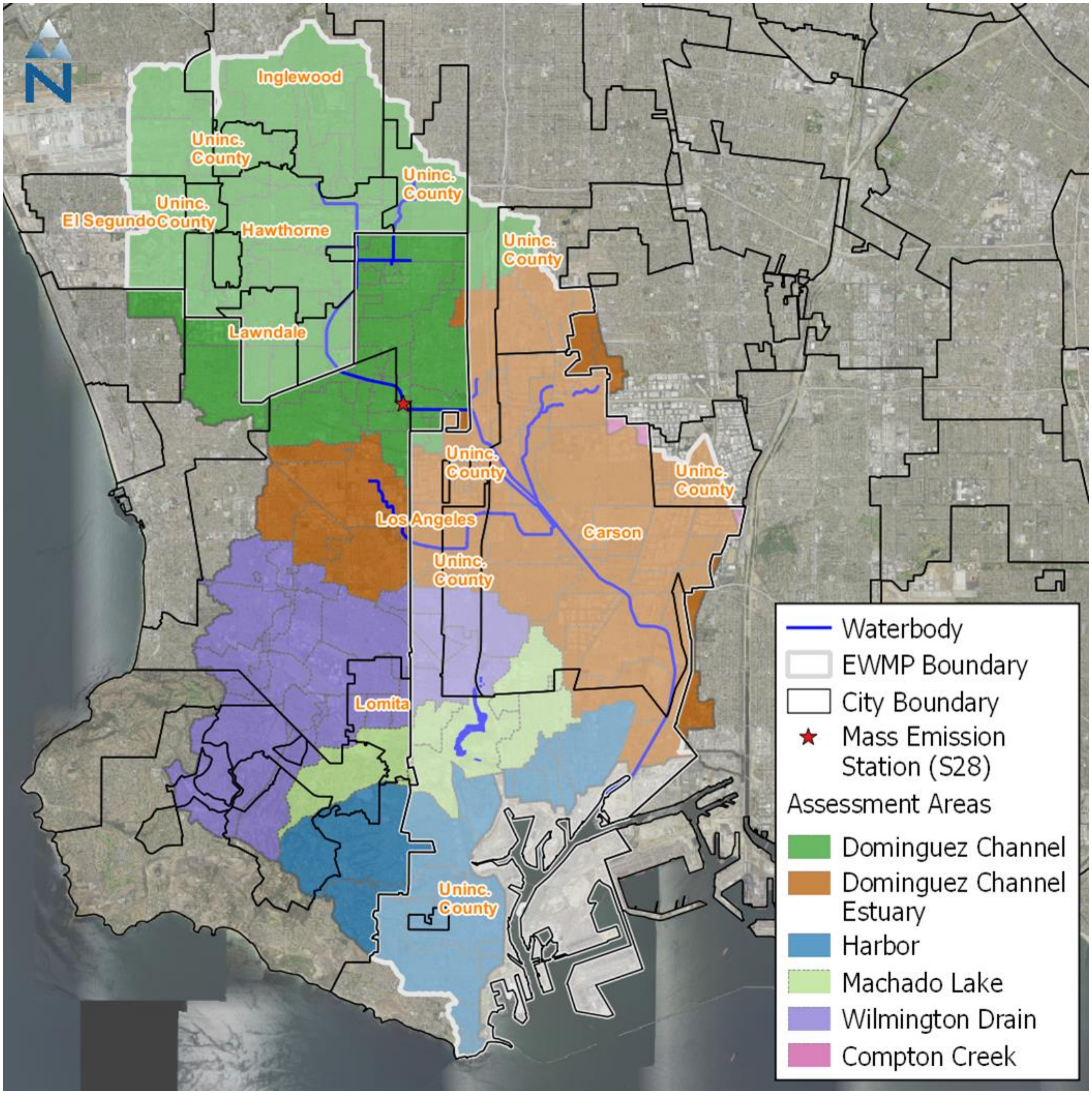


Figure 1-1. Jurisdictional boundaries and tributary areas of the DC WMG after incorporation of Lawndale and Carson.

2 WATER QUALITY PRIORITIES

Carson is located within the Dominguez Channel Watershed Management Area, which was analyzed in Water Quality Priorities section (Section 2) of the DC EWMP. As shown in Figure 1-1, the receiving waters for Carson are the freshwater portion of Dominguez Channel (above Vermont Avenue), the Dominguez Channel Estuary, Machado Lake and Wilmington Drain (which feeds into Machado Lake). These receiving waters were fully evaluated in the DC EWMP, and their Water Quality Priorities are presented in Section 2 of the DC EWMP. The inclusion of Carson does not necessitate any additional Water Quality Priorities in the DC watershed (TMDLs, 303(d) listings, or otherwise). The primary Water Quality Priorities that generally drive the watershed control measures for Carson are zinc (Category 1 Water Quality Priority, DC channel and estuary), nitrogen (Category 3 Water Quality Priority, Wilmington Drain) and indicator bacteria (Category 2 Water Quality Priority, all waterbodies). As demonstrated in subsequent sections, by addressing these three Water Quality Priorities, the other Water Quality Priorities will also be addressed.

Small portions of Carson drain to Compton Creek and LA River Reach 1. The Water Quality Priorities for those areas were derived from the ULAR EWMP, as shown in Table 2-1. These areas are addressed specifically by the EWMP Implementation Plan (Section 5).

To support the source assessment, a variety of data sources were reviewed but limited data were available regarding the sources, concentrations or loads of zinc or bacteria (which are limiting pollutants). Instead, modeling was used to support the source assessment by analyzing the likely areas where zinc and bacteria runoff[2] are originating within the EWMP area. The outputs from the source assessment modeling, presented in Section 2 of the DC EWMP, highlight areas were pollutant load reduction would have the largest benefit. These areas were implicitly emphasized within the RAA process, which includes cost-benefit optimization. Given equal opportunity to implement control measures at equivalent cost, the modeling system prioritizes areas with where the highest load reduction (highest cost-benefit) would occur. In other words, the EWMP Implementation Plan (Section 5) is built upon the source assessment results presented in Section 2 of the DC EWMP.

Table 2-1. LA River Watershed Water Quality Priorities for Carson[1]

Waterbody	Category 1 WQP	Category 2 WQP	Category 3 WQP
Compton Creek	Copper, lead, bacteria, cadmium	Benthic macro-invertebrates,	Chlorpyrifos, chloride, mercury
LA River Reach 1	Copper, lead, bacteria, cadmium, zinc, nitrate, nitrite, nitrogen	Bis(2-ethlyhexyl)-pthalate, cyanide, pH, mercury, diazinon	Selenium, dissolved oxygen, thallium

[1] These water quality priorities only apply to Carson, and were extracted from the ULAR EWMP (January 2016).

[2] Bacteria runoff indicates the amount of runoff during the bacteria critical condition (as described in Section 3.4.1). The EWMP manages entirely the runoff from that storm in order to address the Category 2 bacteria WBPCs. As such, it is the runoff volume that drives the EWMP Implementation Plan rather than bacteria loading.

3 WATERSHED CONTROL MEASURES

The Permit requires the identification of Watershed Control Measures, which are strategies, institutional measures, and BMPs[3] that will implemented through the EWMP individually or collectively at a watershed-scale to address Water Quality Priorities. Section 3 of the DC EWMP describes the categories of BMPs used to develop the DC EWMP (and simulated by the RAA), summarizes existing and planned structural BMPs, and describes the institutional control measures that will be implemented including customization of MCMs.

Two overarching categories of BMPs are discussed throughout the EWMP:

- **Structural BMPs**: these BMPs retain, divert or treat stormwater and/or non-stormwater, and can either be distributed throughout the watershed or sited regionally.
- **Institutional BMPs:** these BMPs encompass the Minimum Control Measures (MCMs) outlined in the permit, other non-structural BMP's, and any other source control measures, such as community education programs.

Furthermore, the three main sub-categories of structural BMPs incorporated into the EWMP include low-impact development (LID), green streets, and regional projects, as defined below:

- **Low impact development (LID):** Distributed structural practices intended to treat runoff relatively close to the source and typically implemented at a single-parcel- or few-parcel-level (normally less than 10 tributary acres).
- **Green streets:** Distributed structural practices intended to treat runoff within public transportation rights-of-way (normally less than 10 tributary acres).
- **Regional BMPs:** Constructed structural practices intended to treat runoff from a contributing area of multiple parcels (normally on the order of 10s or 100s of acres or larger).

Carson evaluated the menu of control measures used for development of the DC EWMP and determined which of the institutional and structural control measures are best suited for its stormwater program. The menu of institutional, LID, green street and regional project control measures selected by Carson is summarized in Table 3-1. Additional information regarding the selected control measures are provided in the following subsections, organized by control measure type.

Carson is still evaluating whether to pursue a Load Reduction Strategy for the LA River Bacteria TMDL, for the small area of city that drain to Segment A and Compton Creek. Carson is implementing (or has already implemented) trash control measures to comply with applicable trash TMDLs in LA River and Machado Lake.

Table 3-1. Summary of Control Measures Selected by City of Carson for EWMP Development

Control Measure Type	Control Measure Subcategory for EWMP / RAA	Incorporation Approach for EWMP for Carson
Institutional	Enhanced institutional	5% baseline for 2012 Permit MCMs, plus additional 5% reduction due to catch basin inserts

[3] In this EWMP, the terms "control measures" and "best management practices (BMPs)" are used interchangeably.

Control Measure Type	Control Measure Subcategory for EWMP / RAA	Incorporation Approach for EWMP for Carson
LID	Planned & Existing Projects	Yes, these projects were incorporated, either explicitly or, for those constructed prior to 2011, implicitly as part of the baseline for the DC EWMP
	New & Re-Development	Yes, incorporated based on projected growth rates
Green streets	Green streets with permeable pavement	Yes, incorporated suitable streets as opportunities for green streets
Regional projects	Public Regional (identified)	Yes, two (2) major regional BMP opportunities are incorporated into EWMP, one of which is presented as a concept design and BMP factsheet similar to those presented in Section 4 of the DC EWMP
	Additional Regional (to be determined)	Yes, incorporated Additional Regional into RAA, as necessary, to provide assurance that load reductions can be achieved.

3.1 Carson Regional Projects

The screening process similar to the one described in the DC EWMP was used to identify potential suitable parcels for siting regional projects in Carson. This similar screening process followed Steps 1-6 presented in Section 4 of the DC EWMP where tax exempt parcels are identified based on the Assessor Identification Number (AIN). These parcels all end with a 3-digit number in the 900's. Tax exempt parcels were grouped into tiers representing how closely-held the property is by the City of Carson. Parcels less than 0.25 acres or that are part of a waterway were excluded. Remaining parcels were evaluated by the Carson to identify a list of potential regional projects, and each potential parcel was included or excluded based on their local knowledge of the sites, ownership, logistics, and the like.

3.1.1 Regional Projects on Public Parcels

Regional projects were identified using a detailed spatial analysis, beginning with an initial screening based on potential constraints, and culminating with an identification of publically-owned parcels potentially suitable for regional projects. Based on the screening analysis, two (2) primary sites were identified as potentially suitable for potential regional projects on public parcels. Table 3-2 summarizes the Regional BMP opportunities identified through the screening process and incorporated into the RAA model for Carson. Figure 3-1 shows the extent of contributing drainage areas to the two identified the potential regional projects. As described in the next subsection, the Carriage Crest Park project was subject to detailed concept design.

The Civic Center project was represented through preliminary, coarse design parameters based on an initial evaluation of the sites using readily-available desktop GIS data sets. During EWMP implementation, the design details for the Civic Center regional project would be further refined. The City is currently in discussions regarding a potential development on and adjacent to the Civic Center property, and the details of that redevelopment project will need to be advanced before the design of the Civic Center project is evaluated in detail.

During adaptive management, the designs for the Carriage Crest Park and Civic Center projects could be modified, the projects could be supplemented by additional projects, or the projects could be replaced entirely by other projects, as long as the equivalent stormwater capture benefit is achieved overall (as described in Section 5)

Table 3-2. Summary of Identified Regional BMPs for Carson

Description	Address	Approximate Location (Lat/Long)	Approximate Available Footprint (acres)	Potential Upstream Area to be Intercepted (acres)	Design Storm Rainfall (inches)
Carriage Crest Park	23800 Figueroa St, Carson, CA 90745	33 48’ 32.2” N / 118 17’ 5.1” W	1.4	180 [1]	0.89
City Hall / Civic Center	55 Civic Plaza Dr, Carson, CA 90745	33 49’ 56.3” N / 118 15’ 35.8” W	3.07	1,110	0.83

1 – Wet-weather drainage area is 180 acres. Additional dry weather capture area totals 938 acres. Refer to Figure 3-1 and Figure 3-2 for illustration of the drainage areas.

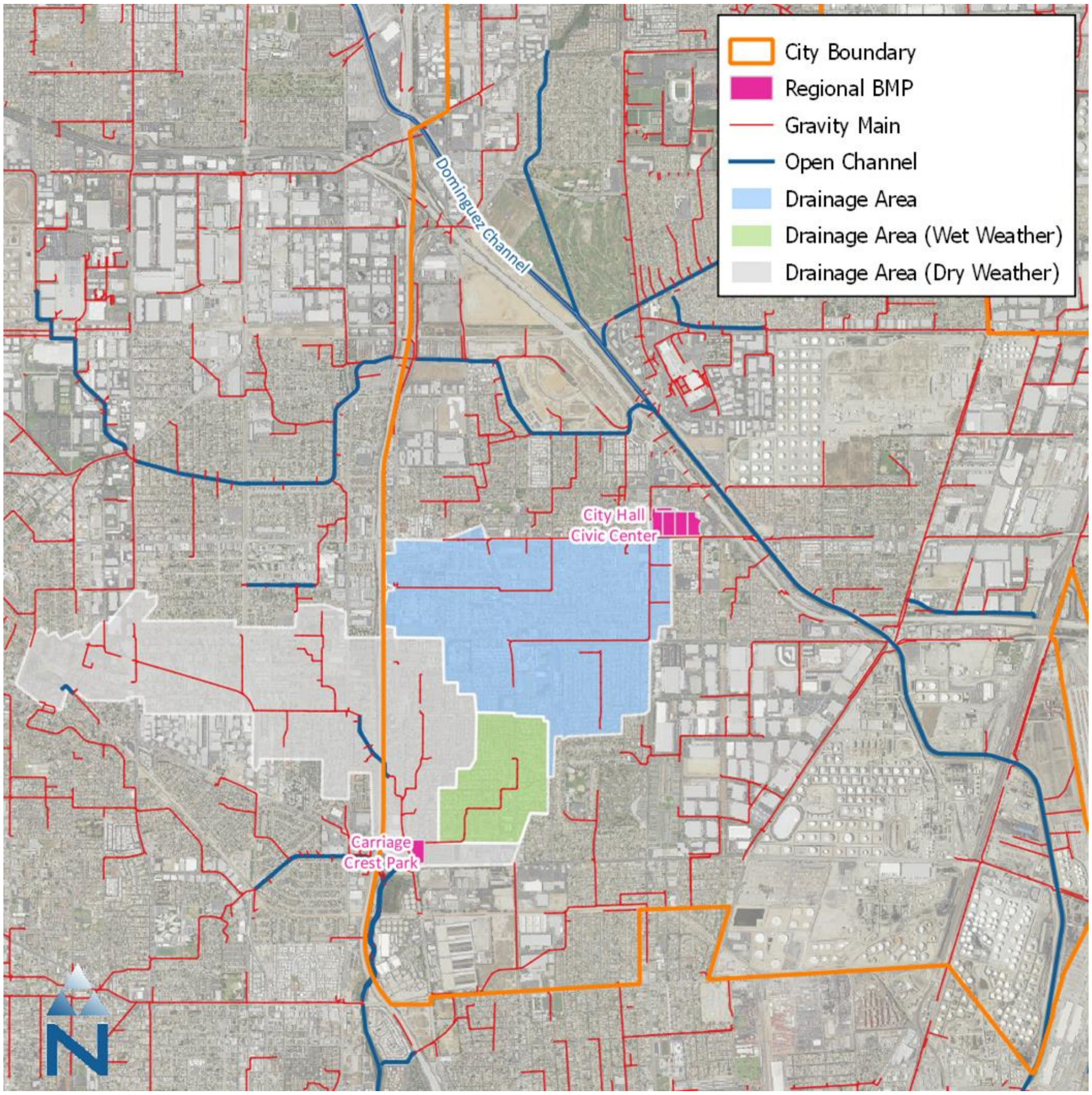


Figure 3-1. Regional BMP Opportunities Identified in Carson.

3.1.2 Carriage Crest Park Concept Design

Carriage Crest Park was identified as a high opportunity site for a regional stormwater capture project due to its proximity to two large storm drains (and thus large treatment area) and potential for multi-jurisdictional partnership. The park is owned and operated by the City of Carson. Due to its proximity to a storm drain junction, the site has access to two potential diversion points. As shown in Figure 3-2, this allows for capture from a 180-acre drainage area completely within the City and a 938-acre drainage area that crosses four neighboring jurisdictions. A preliminary sizing analysis concluded the site has adequate space for a structure footprint capable of treating the 85th percentile, 24-hour runoff event (0.89 inches of rainfall) from the 180-acre drainage area, referred to as the "wet weather capture area" (green shading in Figure 3-2). A second diversion is proposed to also treat dry weather flows from the 938-acre "dry weather capture area" (orange shading). This configuration would maximize the urban area that benefits from the BMP, and also could promote collaboration with neighboring jurisdictions (cities of Los Angeles and Torrance and Unincorporated Los Angeles County).

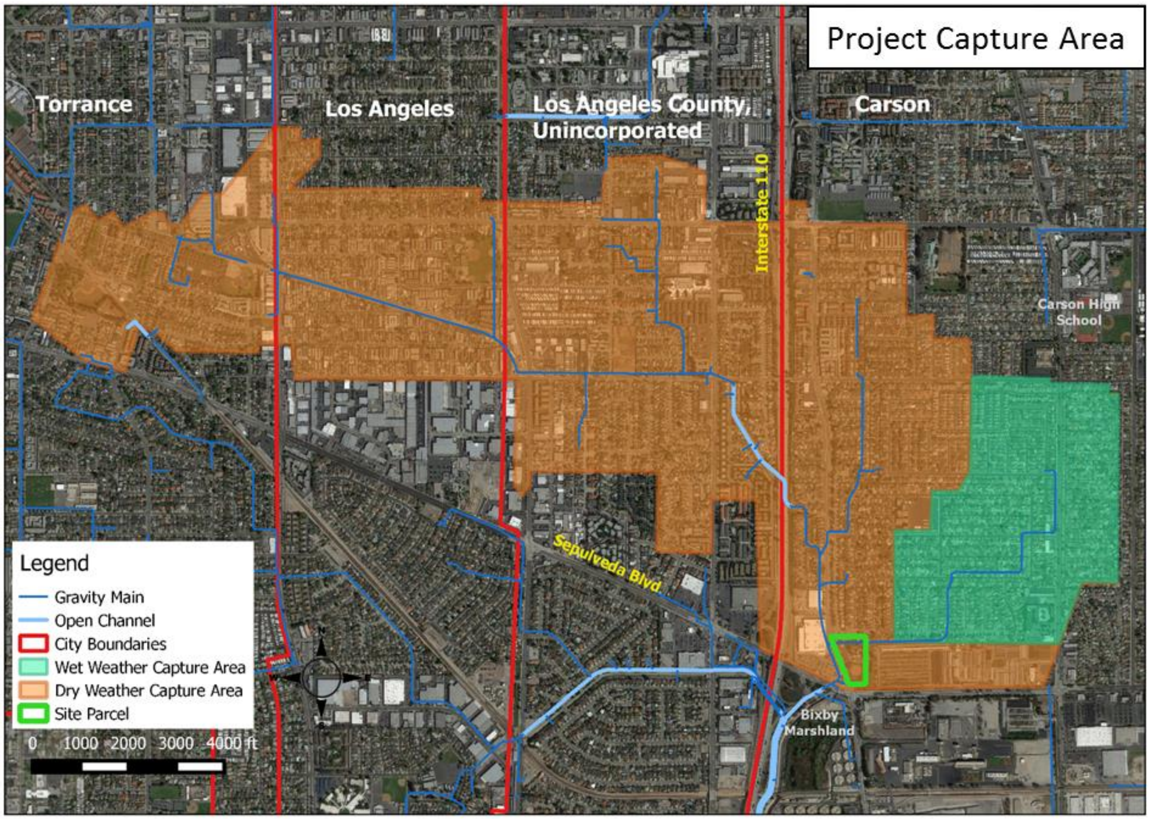


Figure 3-2. Carriage Crest park site parcel and capture areas.

The proposed concept for the Carriage Crest regional BMP consists of an offline infiltration gallery below the ballfield of Carriage Crest Park. The gallery would consist of either a 255' by 240' by 6.5' concrete chamber or twenty 255' rows of 120" corrugated metal pipe. As shown in Figure 3-3, for the wet weather capture area, stormwater would be diverted from the existing 69" drain in the northern section of the park to treat the 85th percentile, 24-hour runoff volume. For the dry weather capture area, a second diversion from the existing double 129" x 79" concrete box drain under South Figueroa Street will be considered to treat dry weather flows of up to 2 cubic feet per second (cfs). Diversion structures are required – the wet weather diversion would be sized to handle the peak design storm flow rate (approximately 14 cfs) and the dry weather diversion would be sized to handle the peak dry weather flow rate (less than 2 cfs). Due to relatively deep invert elevation of the existing storm drains (approximately 9 feet below ground surface), pumping may be required to lift the water to the BMP.

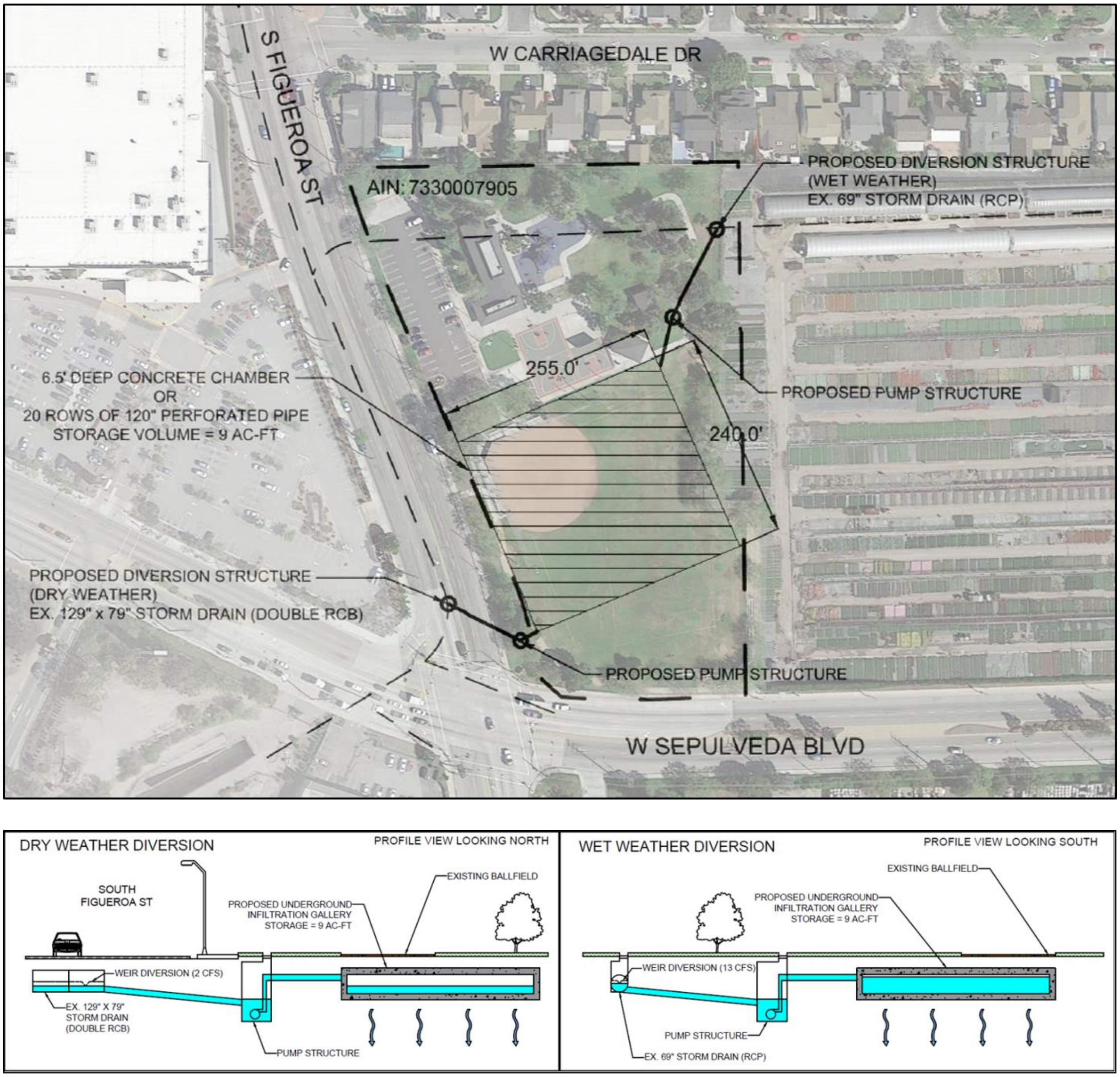


Figure 3-3. Plan (top) **and profile** (bottom) **design considerations for the Carriage Crest Park regional stormwater facility.**

3.1.3 Additional Regional Projects

In some cases, the required pollutant reductions to achieve RWLs may be greater than can be achieved with identified opportunities for MCMs, LID, green streets and regional projects. As such, to provide reasonable assurance, another category of regional BMP – Additional Regional – is included in the RAA and EWMP Implementation Plan. Because specific opportunities for land acquisition and/or public-private partnerships cannot be confirmed during the timeframe of the EWMP development, the RAA modeling described in Section 4 reports a conceptual volume of infiltration basins required in each subwatershed to achieve the required pollutant reductions. As presented in Section 7 of this addendum (Costs and Financial Strategies), the Additional Regional may or may not require land acquisition, depending on the types of public-public and public-private partnerships identified by Carson. Coordination with schools will be a key factor for reducing private regional BMPs, as a substantial portion of public acreage in the EWMP area is school property. Some coordination with schools has already begun, and the EWMP Group looks forward to discussing with the Regional Board potential approaches and incentives to encourage school participation

As an example of Additional Regional, the City is discussing leasing a parcel adjacent to the Carriage Crest Park site from the Los Angeles County Sanitation District, which could allow the Carriage Crest project to be expanded in a subsequent phase to capture additional runoff/drainage area. In this example, the City could avoid land acquisition costs, but would incur costs to lease the land.

The City is also evaluating a site at Stevenson Park that may be feasible for regional BMP implementation. The site may be able to capture approximately 200 acres of the City area.

3.2 LID Programs

A key element of the structural BMP strategy for the DC EWMP is to assume that LID will be distributed throughout the watershed. For the purposes of this EWMP, it is assumed that LID is defined as a series of distributed structural practices that capture, infiltrate, and/or treat runoff at the parcel scale. Common LID practices include bioretention, permeable pavement, and other infiltration BMPs that manage runoff at the source. Rainfall harvest practices such as cisterns can also be used to capture rainwater that would otherwise run off a parcel and offset potable water demands. For the RAA, and in accordance with the City's LID ordinance, LID BMPs are designed to capture the 85th percentile storm from the parcels on which they are located.

Figure 3-4 shows the extent of LID opportunities throughout Carson while the following summarizes key details about each of the LID program components:

- <u>LID due to Redevelopment</u> – the most widespread LID for the EWMP Implementation Plan is LID due to redevelopment (funded by the developer). Average annual redevelopment rates released by the City of Los Angeles were used to project the area that is expected to be developed, as presented in Section 4 of the DC EWMP. The projected benefit of LID due to development in terms of water quality and stormwater capture was incorporated into the EWMP.
- <u>Existing and Planned BMPs</u> – Three existing/planned projects were incorporated for the City of Carson. These include a major redevelopment project at Del Amo Blvd. & Main Street, a smaller scale redevelopment for The Avalon at the corner of Carson & Avalon, and 720 E. Carson St. These LID projects are incorporated into the EWMP and RAA. Other existing BMPs were determined to be a part of the baseline water quality and not explicitly included.

Note that Figure 3-4 shows the assumed LID BMP *opportunities*; the actual *capacity* of LID control measures projected to be implemented by developers is presented in Section 5.

3.3 Green Streets

The Permit specifies that EWMPs should "incorporate effective technologies, approaches and practices, including green infrastructure." Rights-of-way along streets may be the most extensive opportunity for the DC WMG to implement green infrastructure on public land. In developed areas, curb and gutter in the road provides the primary means of conveying stormwater (and associated pollutants) directly to storm drain inlets and receiving waters. Green streets provide an opportunity to intercept this runoff prior to entering the MS4 and treat it within the public right-of-way. Green streets are typically implemented as linear bioretention/biofiltration practices installed parallel to roadways. Systems receive runoff from the gutter via curb cuts or curb extensions (sometimes called bump outs) and infiltrate it through native or engineered soil media. Permeable pavement can also be implemented in tandem, or as a standalone practice, in parking lanes of roads.

Green streets have been demonstrated to provide "complete streets" benefits in addition to stormwater management, including pedestrian safety and traffic calming, street tree canopy and heat island effect mitigation, increased property values, and even reduced crime rates. As with LID, green streets tend to be distributed practices that are deployed throughout a watershed to treat runoff near the source. Key advantages of green streets, however, are that they are located on land directly controlled by public entities and can intercept runoff from larger upstream drainage areas when compared to LID projects.

The methods for screening potential street opportunities are described in Attachment R of the DC EWMP. Screening for green street opportunities throughout Carson followed a similar procedure by filtering out suitable road functional classes based on the Census 2010 TIGER roads data set. When applied to Carson, this screening procedure identified over 150 lane miles of *potential* length for green streets, as shown in Figure 3-4. Note that Figure 3-4 shows the green street BMP *opportunities* (suitable streets); the *capacity* of green streets to be implemented for Carson's EWMP Implementation Plan (per the RAA) is presented in Section 5.

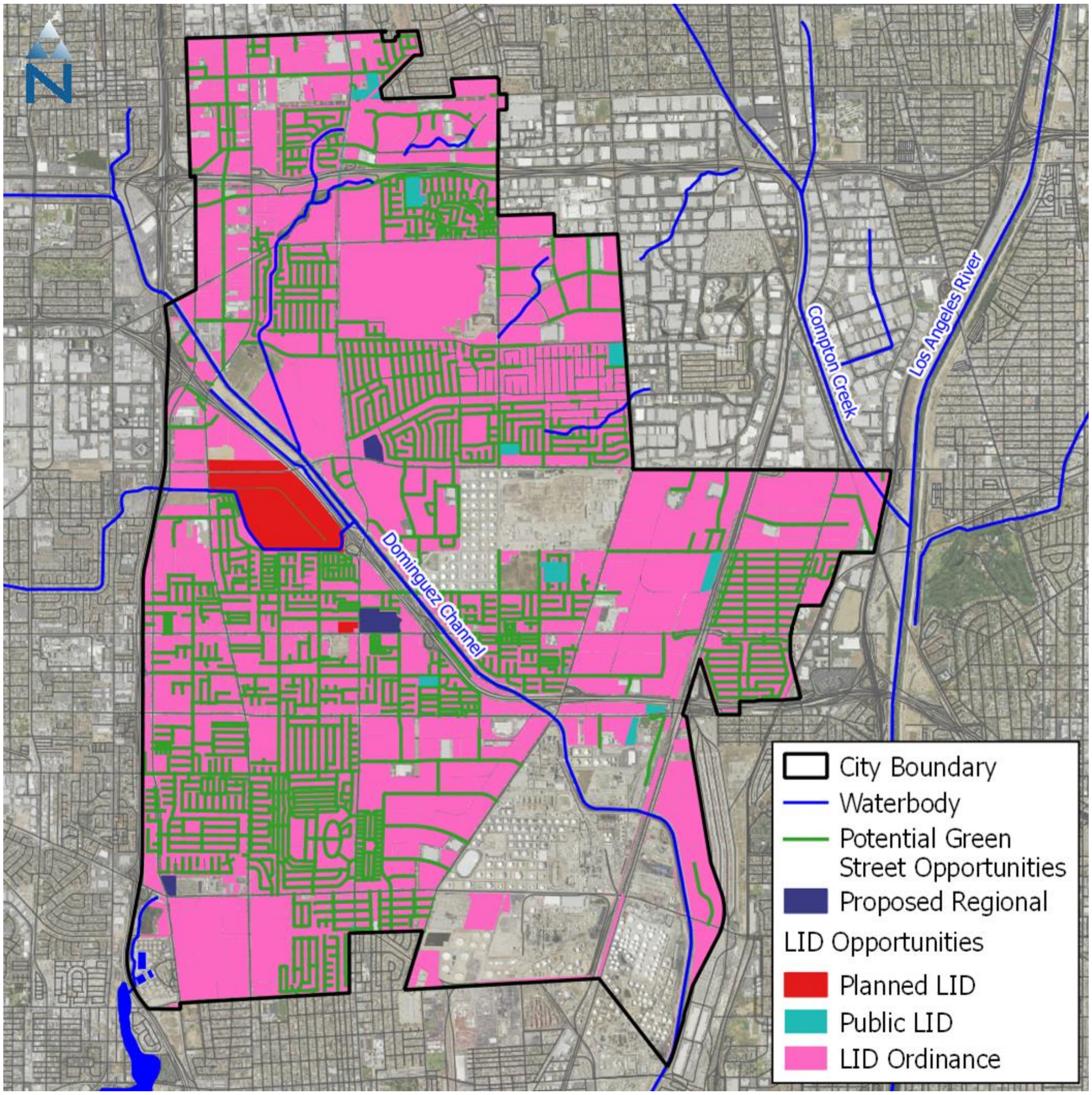


Figure 3-4. Opportunities for LID Identified in Carson.

3.4 Institutional BMPs

Institutional BMPs are a fundamental component of Carson's stormwater program, including the MCMs required by the Permit. For development of this initial EWMP, Carson has elected to not customize the baseline MCMs in the 2012 Permit. Consistent with the DC EWMP, the Carson RAA assumes that implementation of the MCMs in the 2012 Permit will represent a 5% increase in pollutant reduction when compared to the MCMs under the previous Permit (see Section 4.1 of the EWMP). Carson will also be implementing additional institutional control measures to achieve at least an additional 5% reduction, for a total of 10% reduction due to institutional control measures, including the following:

- Implementation of 920 trash control devices, both automatic retractable screens (ARS) and connector pipe screen (CPS) devices, by 2017. This will also increase the inspection and potential clean out of these catch basins.

- Implementation of a program to monitor the trash in the areas of the Priority A catch basins and will increase the frequency of street sweeping in these areas if deemed necessary.

During adaptive management, Carson may identify additional institutional control measures to reduce pollutants and incorporate them into the EWMP (perhaps including higher % reductions than 10%).

4 REASONABLE ASSURANCE ANALYSIS

A key element of the EWMP is the RAA, which is prescribed by the Permit as a process to demonstrate "that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term" (Permit section C.5.b.iv.(5), page 63 – RWQCB, 2012). While the Permit prescribes the RAA as a quantitative demonstration that control measures will be effective, the RAA also promotes a modeling process to support the DC WMG with selection of control measures. In particular, the RAA was used to evaluate the many different scenarios/combinations of LID, green streets and regional BMPs (as described in Section 3) that could potentially be used by Carson to comply with the RWLs and WQBELs of the Permit. The RAA modeling system was then used to select the control measures that are most cost-effective for achieving the required pollutant reductions. The selected control measures are referred to as the "EWMP Implementation Plan" for Carson (described in Section 5).

The RAA for Carson follows the framework established in Section 3 of the DC EWMP. In 2014, the Regional Board issued RAA Guidelines (RWQCB, 2014), which outline expectations for developing RAAs, and those guidelines were followed closely during development of this RAA. This section presents some of the key metrics associated with the RAA, including required pollutant reductions for Carson receiving waters. As possible, details of the RAA are not repeated here. Instead, the reader should refer to Section 4 of the DC EWMP.

This section highlights key metrics associated with the RAA as follows:

- Overview of modeling approach and modeling domain (4.1)
- Baseline watershed model calibration (4.2)
- Baseline critical conditions and required pollutant reductions (4.3)
- Representation of control measures in RAA (4.4)
- Approach for selecting control measures for the EWMP Implementation Plan (4.5)

4.1 Overview of RAA Modeling Approach

The Watershed Management Modeling System (WMMS) is the modeling system used to conduct the RAA for the Carson EWMP. WMMS is specified in the Permit as an approved tool to conduct the RAA. The WMMS includes a comprehensive watershed model of the entire Los Angeles County area that represents the unique hydrology and hydraulics features and characterizes pollutant loading and downstream transport for all of the key TMDL constituents (Tetra Tech 2010a, 2010b).

There are 130 subwatersheds in the Dominguez Channel and Estuary Watershed portion of the WMMS model (Figure 4-1). Figure 4-2 zooms into the 36 subwatersheds and four receiving water/assessment area that the Carson jurisdictional boundary intersects.

In addition to the structural control measures to retain runoff, the EWMP also includes actions in Machado Lake that are anticipated to address nutrient TMDL requirements (Section 2.5 of the DC EWMP). As such, the control measures in the portions of Carson that drain to Wilmington Drain and Machado Lake are driven by control of bacteria.

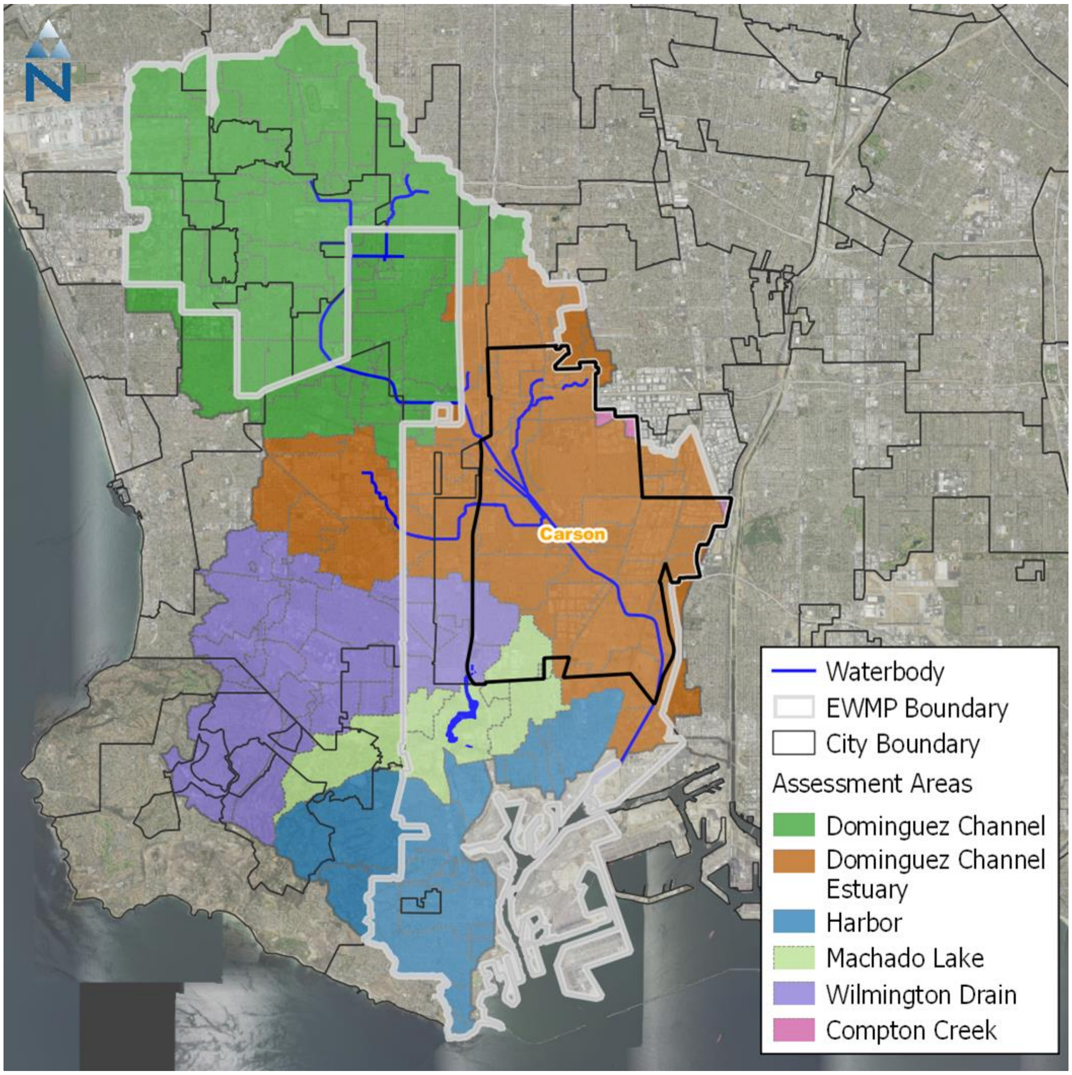


Figure 4-1. Location of Carson within the DC EWMP Area.

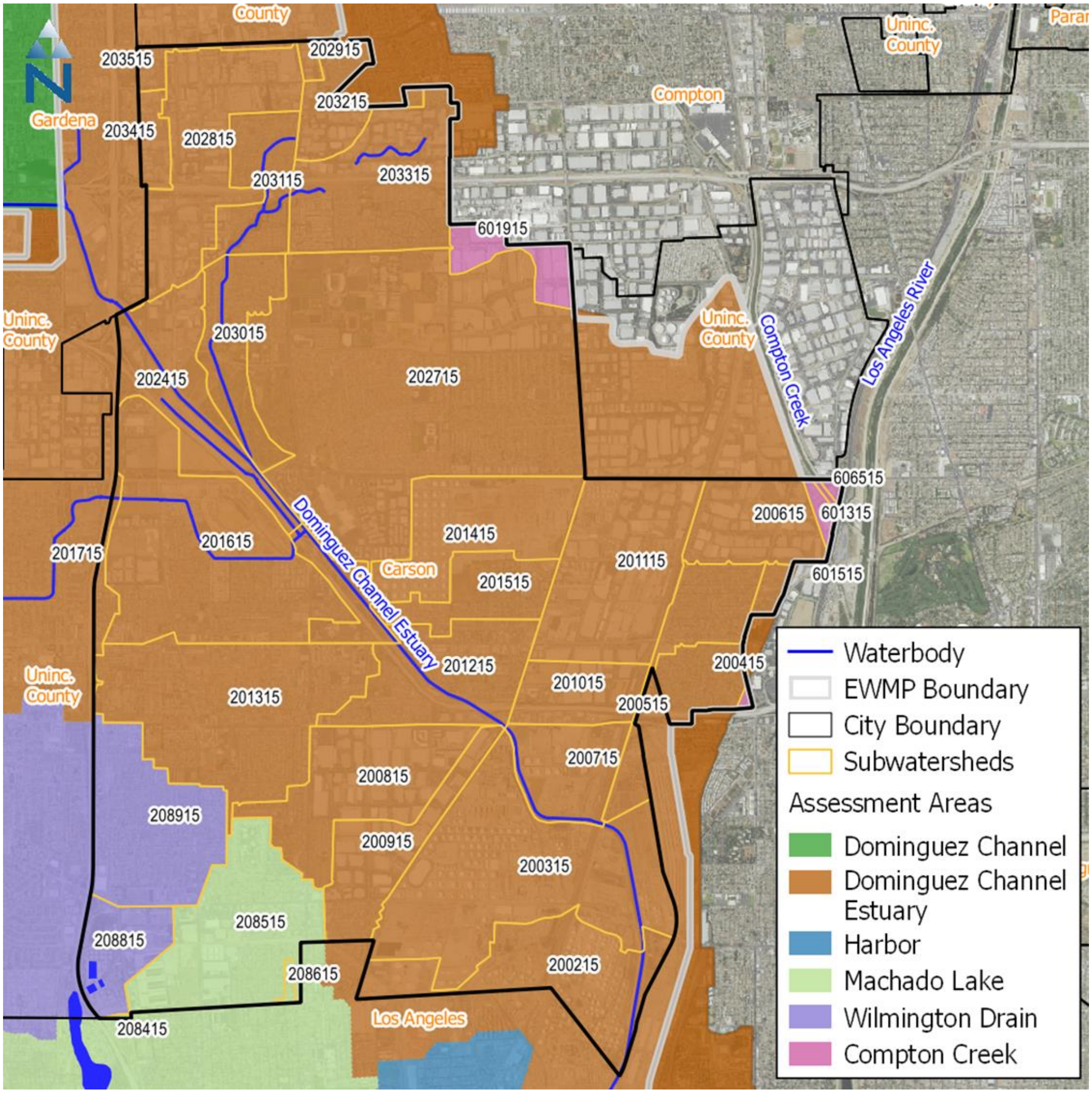


Figure 4-2. Zoomed in view of Carson subwatersheds and receiving waters.

4.2 Baseline Watershed Model Calibration

The objective of baseline watershed model calibration is to develop a watershed model that is representative of receiving water hydrology and water quality in the Dominguez Channel watershed. The baseline model used for the DC EWMP was applied directly to the RAA for Carson. Calibration performance and comparison to the RAA Guidelines are provided in Section 4 of the DC EWMP.

Given that the instream flow gage is the point of reference for model calibration, establishing a baseline model focuses on identifying features and processes that occur between the point where runoff originates and the gage where flow and water quality are measured. The Dominguez Channel portion of the *original* WMMS model was uncalibrated because flow and water quality data were either not available or not accessible when WMMS was originally developed. As such, the WMMS model was updated, as described in Section 4 of the DC EWMP, in order to improve the calibration. The calibration primarily relied upon flow and water quality monitoring data provided by the LACFCD from the S28 mass emission station on Dominguez Channel at Artesia Blvd. S28 is in the freshwater portion of Dominguez Channel, upstream of the tidally-influenced reaches of channel. The area upstream of S28 represents approximately 30% of the total drainage area for Dominguez Channel and Dominguez Channel Estuary, as shown in Table 4-1. The drainage area upstream of S28 is also representative in terms of land use and rainfall distribution, as shown in Table 4-1.

Table 4-1. Comparison of land use distribution upstream of the S28 gage versus the entire Dominguez Channel and Estuary watershed

Land Use		Land Use Distribution[1] by Drainage Area			
		Dominguez Channel and Estuary Watershed		Dominguez Channel at Artesia Blvd (S28)	
		Acres	Percent	Acres	Percent
Impervious	Residential	10,889	16%	4,176	20%
	Commercial	5,854	8%	2,256	11%
	Institutional	2,670	4%	907	4%
	Industrial	10,412	15%	2,035	10%
	Roads	10,258	15%	3,958	19%
Urban Pervious		26,581	38%	7,493	35%
Non-Urban		3,455	5%	382	2%
Total		**70,119**	**100%**	**21,208**	**100%**

1: Color gradient shows relative land use distribution from least (white) to greatest (red).

4.3 Baseline Critical Conditions and Required Pollutant Reductions

The critical condition for the DC EWMP is the storm that produces the 90th percentile pollutant load. The RAA and EWMP Implementation Plan are based on achieving required pollutant load reduction to attain the water quality targets during that critical condition. The primary water quality targets for Carson's assessment areas presented in the DC EWMP. The baseline 90th percentile loading for the limiting pollutants for each assessment area was determined along with the required reductions to achieve the corresponding water quality targets. The limiting pollutant analysis from the ULAR EWMP also supports the identification of zinc and bacteria as limiting pollutants. Shown in Table 4-2 are the calculated required pollutant reductions for interim and final compliance. The simulated required zinc reduction, 86%, is quite high compared to other waterbodies in the region, which ultimately drives the overall capacity of BMPs in Carson's EWMP Implementation Plan.

In accordance with the RAA Guidelines, the interim required reductions are based on the average storm while the final required reductions are based on the 90th percentile storm event. The ratio of average to 90th percentile loading (shown in Table 4-2) is used to phase from interim to final compliance over the course of the EWMP implementation schedule.

It is noted that for bacteria (*E. coli*), a slightly different approach from the DC EMWP was used. Rather than rely on load reduction, the RAA is based on full retention of the runoff from the 90^{th} percentile "critical bacteria storm." See the draft Upper LA River EWMP (ULAR Group, 2015) for details on the RAA methodology used to address bacteria. The 90^{th} percentile critical bacteria storm accounts for allowable exceedance days and the High Flow Suspension, using the MS4 wasteload allocations from the LA River Bacteria TMDL as a template. The LA River Bacteria TMDL includes 10 allowable exceedance days in addition to High Flow Suspension days.

Table 4-2. Required Pollutant Reductions for Interim and Final Compliance for Carson Assessment Areas

<table>
<tr><th>Condition and Pollutant Addressed</th><th>Reduction Metric</th><th>Dominguez Estuary</th><th>Wilmington Drain</th><th>Machado Lake</th></tr>
<tr><td rowspan="3">Final Compliance with Metals and Other Water Quality Priorities (except E. coli)</td><td>Required Load Reduction [1]</td><td>86.2% (total zinc) [2]</td><td rowspan="5" colspan="2">Runoff from critical bacteria storm is retained prior to discharge to receiving water</td></tr>
<tr><td>Allowable load during 90^{th} percentile/final condition (pounds)</td><td>145.1</td></tr>
<tr><td>Loading during 90^{th} percentile/final condition (pounds) [3]</td><td>1,051.4</td></tr>
<tr><td rowspan="2">Interim Compliance with Metals and Other Water Quality Priorities (except E. coli)</td><td>Loading during average/interim condition (pounds) [4]</td><td>319.8</td></tr>
<tr><td>Ratio used to gradually phase from interim to final reduction (Average:90^{th} Percentile)</td><td>0.30</td></tr>
<tr><td>Final Compliance with E. coli</td><td>Runoff volume to be retained [5]</td><td colspan="3">Runoff from critical bacteria storm is retained prior to discharge to receiving water</td></tr>
</table>

1 – Based on control of zinc (Dominguez Channel Estuary) during storm that generates the 90^{th} percentile load for the respective pollutant
2 – For Dominguez Channel Estuary, the total zinc target was set to 95.14 ug/L, which is the CTR criteria for saltwater
3 – Loading of zinc or nitrogen at mouth of watershed from storm that generates the 90^{th} percentile zinc load
4 – Loading of zinc or nitrogen at mouth of watershed from storm that generates the average zinc load
5 – Critical bacteria storm methodology is consistent with the Upper Los Angeles River EWMP (ULAR Group 2015)

4.4 Representation of EWMP Control Measures

The representation of control measures in the model is an important element of the RAA, as it provides the link between future watershed activities, model-predicted water quality improvement and ultimately, compliance. An overview of menu of control measures selected by Carson for inclusion in the EWMP and the analysis/screening of potential BMP opportunities in the city limits was presented in Section 3.

The RAA for Carson introduces a key analytical element – application of the BMP model SUSTAIN – which was not previously applied in the original DC EWMP. By applying SUSTAIN, the EWMP Implementation Plan for Carson is able to benefit from optimization, which helps to increase the cost efficiency of the BMP network. The design assumptions in Table 4-3 were used within the SUSTAIN model to represent BMPs and their performance.

Table 4-3. Summary of EWMP control measure opportunities included in RAA

BMP Category	Sub-Type	Description of BMP Program	RAA Assumptions regarding BMP Design Parameters
Institutional	MCMs and/or Enhanced MCMs	For 5% reduction: implement new MCMs in 2012 Permit. For the additional 5% reduction, Carson identified trash control measures for implementation.	None, not modeled explicitly.
LID	LID Ordinance (New/ Redevelopment)	BMP implementation assumed to equal redevelopment growth rates reported by Los Angeles Bureau of Sanitation (see Section 4 of the DC EWMP). Carson will track redevelopment and verify that that LID is implemented at projected rate, based on capacities and schedules in Section 5.	Bioretention/Biofiltration sized to capture 85th percentile runoff from parcel. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.
	Existing and Planned BMPs	Planned LID BMPs will be implemented as planned, according to projects constructed after 2011 that were listed in Section 3.2	Bioretention/Biofiltration sized to capture 85th percentile runoff from parcel. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.
Green Streets	Green Streets	Carson will implement green street projects according to the specified capacities and schedule in Section 5.	Bioretention/biofiltration is 4-ft wide. Permeable pavement/subsurface storage is 5-ft wide and used in tandem with bioretention/biofiltration. 50% of street length retrofittable. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.

BMP Category	Sub-Type	Description of BMP Program	RAA Assumptions regarding BMP Design Parameters
Regional	Carriage Crest Park	Carson will implement regional projects according to the specified capacities in Section 5. Details of the project design are presented in Section 3.1.2 and in the project factsheet.	BMP footprint delineated and depth specified based on site configuration, topography, depth to groundwater, and other infrastructure. See Section 3.1 for drainage area details.
	City Hall / Civic Center	Carson will implement other regional projects, potentially at the City Hall / Civic Center site, according to the specified capacities in Section 5. Due to uncertainty pending more detailed site evaluation, this regional BMPs was assumed to be a 3-ft-deepinfiltration basin.	
	Additional Regional BMPs (TBD)	Carson will implement undetermined regional projects, if necessary, according to the specified capacities in Section 5. During adaptive management, the City will strive to find additional opportunities for BMPs on public land to avoid this category of BMP / land acquisition. For example, the City is discussing leasing a parcel adjacent to the Carriage Crest Park site from the Los Angeles County Sanitation District, which could allow the Carriage Crest project to be expanded in a future phase to capture additional runoff/drainage area.	Assumed 3-ft-deep infiltration basin at subwatershed outlets. Maximum footprint = 5% of contributing area.

4.5 BMP Selection for EWMP Implementation Plan

The RAA process is an important tool for assisting EWMP agencies with selection of control measures for the EWMP Implementation Plan. A major challenge associated with stormwater planning is the multitude of potential types and locations of control measures and the varying performance and cost of each scenario. The SUSTAIN model within WMMS provides a powerful tool for considering millions of scenarios of control measures and recommending a solution based on cost-effectiveness.

4.5.1 Selection of Control Measures for Final Wet Weather Compliance

The RAA process for Carson first determined the control measures to achieve the required load reductions under critical conditions and then determined the additional capacity (if any) to retain the critical bacteria storm. The optimization modeling is conducted stepwise to determine the control measures for final compliance that are selected for the EWMP Implementation Plan, as follows:

1. Determine the cost-effective BMP solutions for each subwatershed in the EWMP area: an example set of "BMP solutions" is shown in Figure 4-3, which shows millions of scenarios considered for an individual subwatershed in the EWMP area. Notice the different scales for each assessment area (most BMP capacity is in Dominguez Estuary). The scenarios are based on the available opportunity (e.g., the available footprints for regional BMPs and length of right-of-way for green streets) and predicted performance for controlling zinc (or, for Wilmington Drain, nitrogen) if BMPs were implemented at those opportunities with varying sizes. The most cost-effective BMP solutions for each of the 36 subwatersheds in Carson provide the basis for cost optimization. The optimization curve for Wilmington Drain is dominated by the Carriage Crest Park regional stormwater facility.

2. By rolling up the most cost-effective BMP solutions at the subwatershed level, the most cost-effective EWMP Implementation Plan can be estimated. The cumulative "cost- optimization curves" for the subwatersheds becomes the overall cost optimization curves for Carson, as presented in Figure 4-4. The optimized point on each curve includes a "recipe for compliance" for all the subwatersheds within that assessment area.

3. Extract the cost-effective scenarios for the required reduction: the required zinc or nitrogen reductions specified in Table 4-2 determine the specific scenario that is selected from the cost optimization curves. The Carson assessment areas would be held to the same percent reduction as other jurisdictions contributing to the same waterbodies. The selected scenarios become the EWMP Implementation Plan. The extracted control measures comprise a detailed recipe for compliance with RWLs for metals and other Water Quality Priorities for each subwatershed in the jurisdictional area.

4. Route the critical bacteria storm through the control measures in the extracted scenario: the effectiveness of the selected control measures for retaining the critical bacteria storm is evaluated. The additional capacity (if any) to retain the critical bacteria storm is determined for each subwatershed.

Figure 4-5 illustrates the process described above for using optimization to determine the combination of LID, green streets and regional BMPs that make up the EWMP Implementation Plan.

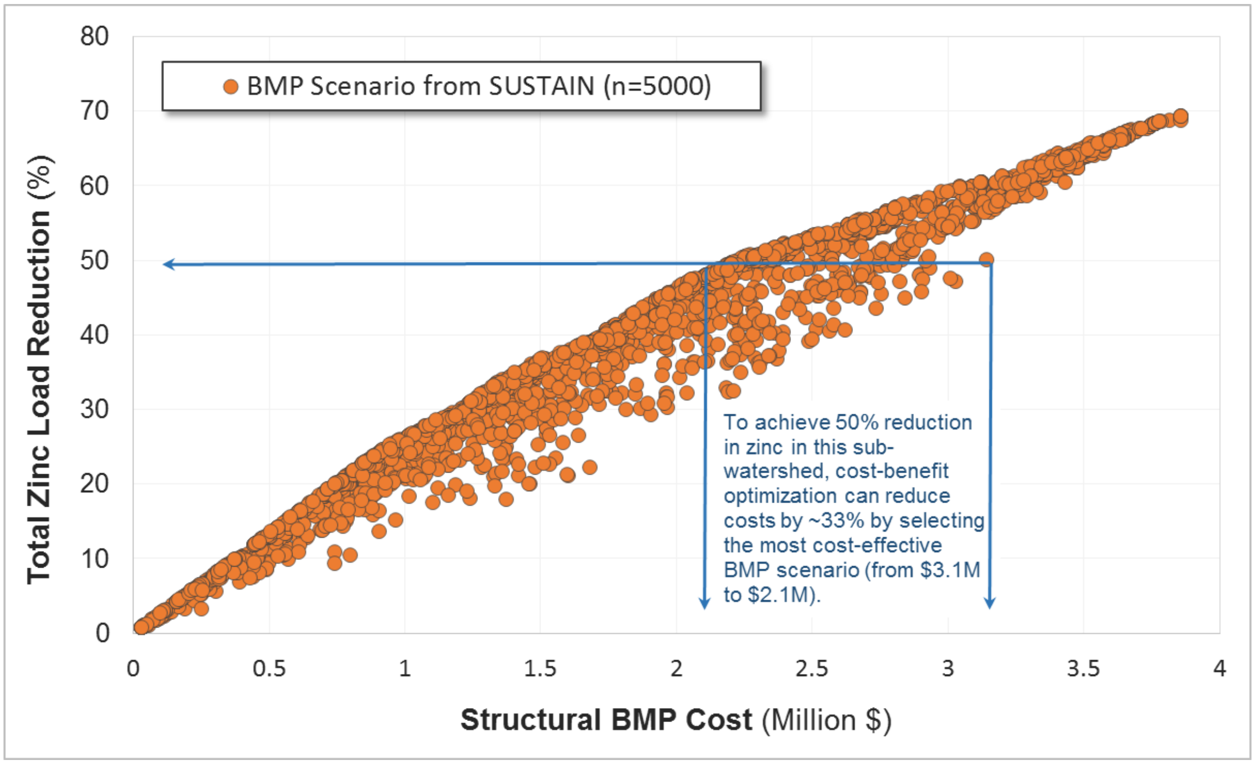


Figure 4-3. Example BMP solutions for a selected subwatershed and advantage of cost-benefit optimization.

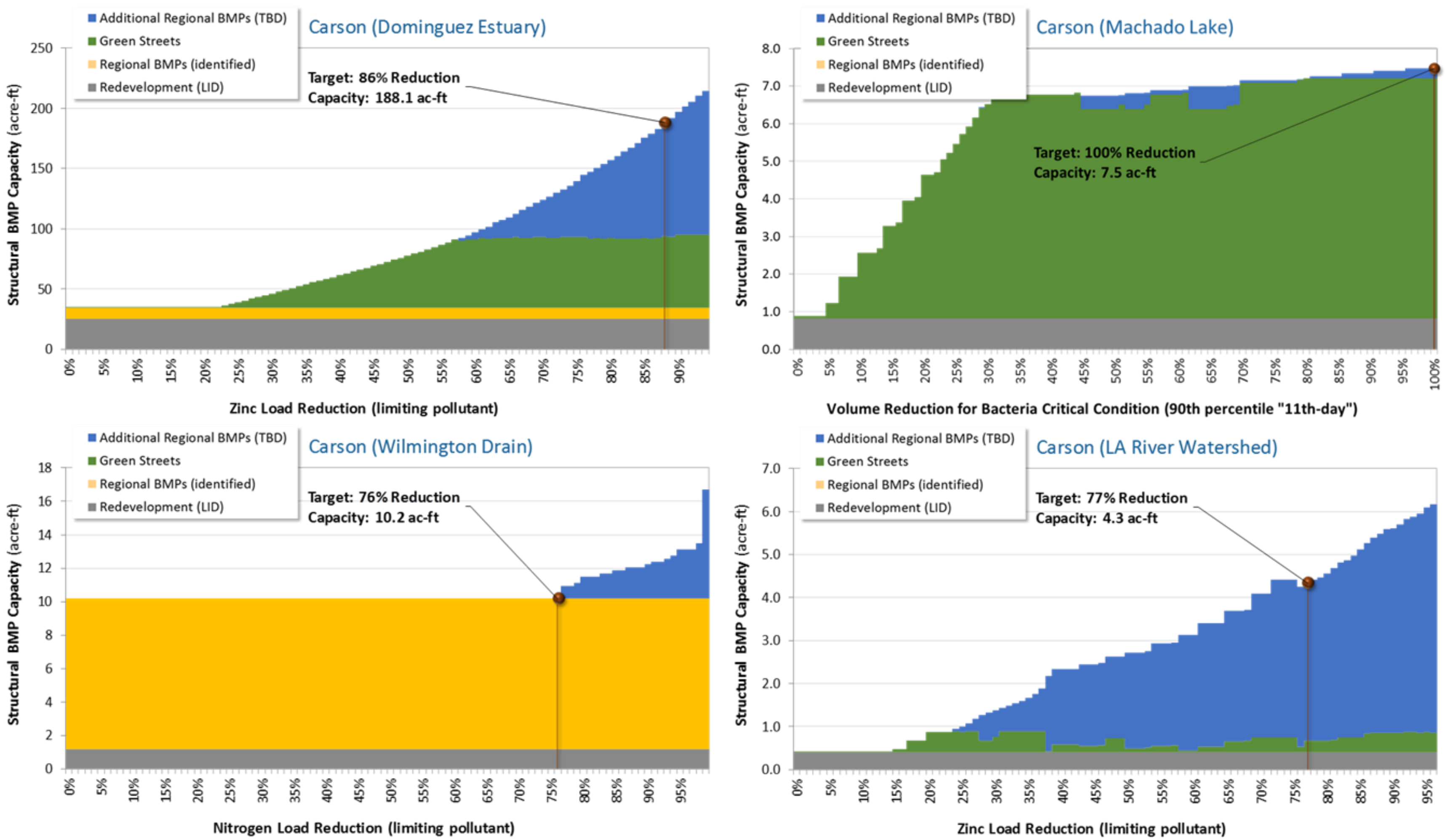
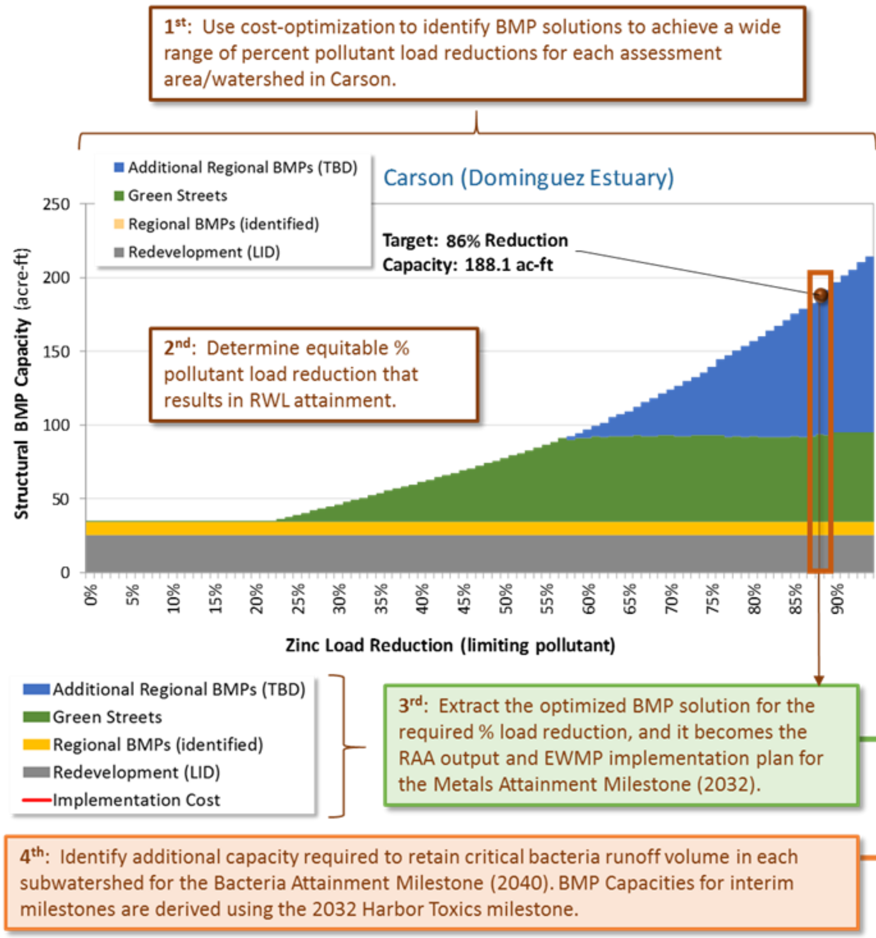


Figure 4-4. Cost Optimization curves for Carson assessment areas.

This graph shows the set of optimized BMP solutions for the four assessment areas in Carson. These optimization curves represent over 1 million BMP scenarios that were evaluated for cost-effectiveness. The required reduction varies by assessment area; the curves vary with BMP opportunity.



Detailed Recipe (by 2040)

	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)							
	For Toxics by 2032	For Bacteria by 2040	Harbor Toxics TMDL and other WQPs by 2032						For Bacteria Attainment by 2040	
				LID	Streets	Regional BMPs				
Subwatershed ID	24-hour Volume Managed (acre-ft)	Additional 24-hour Volume Managed (acre-ft)	% Load Reduction Critical Condition	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)	Regional BMPs (additional)	Cumulative BMP Capacity for Final Compliance (acre-ft)
200215	1.33	0.01	56%	0.84	0.31	---	---	**1.15**	0.01	**1.17**
200315	7.43	---	95%	1.98	0.15	---	3.77	**5.89**	---	**5.89**
200415	2.43	0.05	81%	0.21	2.01	---	---	**2.21**	0.05	**2.26**
200515	3.22	0.09	77%	0.35	2.55	---	---	**2.90**	0.09	**3.00**
200615	9.31	---	90%	0.87	1.09	---	5.89	**7.84**	---	**7.84**
200715	1.51	0.02	75%	0.83	0.47	---	---	**1.30**	0.02	**1.32**
200815	13.15	---	91%	0.88	3.18	---	5.65	**9.71**	---	**9.71**
200915	9.19	---	91%	0.58	2.02	---	4.22	**6.82**	---	**6.82**
201015	7.03	---	95%	0.93	0.28	---	4.17	**5.39**	---	**5.39**
201115	17.95	---	85%	1.81	0.64	---	12.56	**15.01**	---	**15.01**
201215	6.06	0.16	76%	1.07	3.93	---	---	**5.00**	0.16	**5.16**
201315	25.57	---	96%	0.59	1.93	9.21	9.60	**21.33**	---	**21.33**
201415	3.87	---	95%	0.91	0.56	---	1.80	**3.26**	---	**3.26**
201515	2.44	0.05	80%	0.22	2.03	---	---	**2.24**	0.05	**2.29**
201615	19.81	---	95%	1.20	8.13	---	6.53	**15.87**	---	**15.87**
201715	0.70	0.08	46%	0.39	0.25	---	---	**0.64**	0.08	**0.72**
202415	7.19	---	90%	2.39	0.53	---	3.30	**6.23**	---	**6.23**
202715	44.64	---	91%	2.11	15.89	---	19.76	**37.76**	---	**37.76**
202815	16.71	---	90%	1.63	2.73	---	9.62	**13.97**	---	**13.97**
202915	0.09	0.06	20%	0.05	0.03	---	---	**0.08**	0.06	**0.14**
203015	1.94	0.07	82%	0.09	1.74	---	---	**1.82**	0.07	**1.90**
203115	2.96	0.21	67%	0.40	2.23	---	---	**2.62**	0.21	**2.83**
203215	1.69	0.28	55%	0.25	1.29	---	---	**1.54**	0.28	**1.81**
203315	15.29	---	95%	1.76	5.19	---	6.38	**13.32**	---	**13.32**
203415	2.51	---	90%	0.26	0.14	---	1.69	**2.09**	---	**2.09**
203515	0.38	0.13	30%	0.10	0.24	---	---	**0.34**	0.13	**0.47**
Total	**224.41**	**1.21**	**87.7%**	**22.68**	**59.52**	**9.21**	**94.92**	**186.33**	**1.21**	**187.55**

RED = Subwatersheds with highest required % load reductions
BLUE = Subwatersheds with highest BMP capacities within a BMP category

Figure 4-5. Illustration of how the EWMP Implementation Plan is extracted from a cost optimization curve.

This illustration Carson's area in the Dominguez Estuary watershed as an example. Four steps are shown for RAA development: developing cost-optimized BMP solutions for a wide range of % load reductions (1st, uppermost text box), determining the equitable % load reduction needed to attain RWLs for the corresponding receiving water (2nd, middle text box), extracting the BMP solution for metals attainment (3rd, bottom text box), and identifying additional capacity for bacteria attainment (4th, bottom text box). Other details of the EWMP Implementation Plan are presented in Section 5. Note that while each assessment area/watershed achieves the required 89.5% reduction in aggregate, subwatersheds *within* the jurisdiction have variable reductions based on optimization (which is why some subwatersheds have high % reductions [red shaded rows in table] and others have low % reductions)

4.5.2 Selection of Control Measures for Interim Wet Weather Compliance

With the EWMP Implementation Plan for final compliance determined, the remaining step for the wet weather RAA is scheduling of control measures *over time* to achieve interim milestones. Following an identical approach as the DC EWMP, the following wet weather milestones were used for development of the Carson EWMP Implementation Plan, primarily based on the achieving the final limits of the DC Toxics TMDL by 2032 and addressing bacteria by 2040:

- Achieve 50% of the reduction for zinc[4] (2026)
- Achieve 75% of the reduction for zinc (2029)
- Final compliance with zinc WQBELs (2032)
- Final compliance with total nitrogen RWLs (2040)
- Final compliance with bacteria RWLs (2040)

The exception was the small area of Carson that drains to the Los Angeles River watershed. For this area, the zinc/metals milestones of 50% and 100% were set for 2024 and 2028, respectively, and the bacteria milestone is set for 2037. These milestones are also consistent with the ULAR EWMP.

5 EWMP IMPLEMENTATION PLAN

The EWMP Implementation Plan is the "recipe for compliance" for Carson to address Water Quality Priorities and comply with the provisions of the MS4 Permit. Through the RAA, a series of quantitative analyses were used to identify the capacities of LID, green streets and regional BMPs that comprise the EWMP Implementation Plan. The RAA also assures those control measures will address the Water Quality Priorities within the specified compliance schedules. The EWMP Implementation Plan includes a recipe for of Carson's assessment areas (see Figure 4-2 for a map of these assessment areas). Implementation of the EWMP Implementation Plan will provide a BMP-based compliance pathway for Carson to achieve the MS4 Permit. This section describes the EWMP Implementation Plan for Carson and the pace of its implementation to achieve applicable milestones, through the following subsections:

- Elements of the EWMP Implementation Plan (5.1)
- Stormwater control measures to be implemented by 2040 for final compliance (5.2)

5.1 Elements of the EWMP Implementation Plan

The EWMP Implementation Plan for Carson is expressed in terms of [1] the volumes[5] of stormwater and non-stormwater to be managed by Carson to address Water Quality Priorities and [2] the control measures that will be implemented to achieve those volume reductions. The two primary elements of the EWMP Implementation Plan are as follows:

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[4] While these milestones are expressed as reduction in zinc, because zinc is a limiting pollutant (see Section 3 of the DC EWMP), achievement of zinc RWLs by these dates assures even greater reduction in other Water Quality Priority pollutants.

[5] Volume is used rather than pollutant loading because volume reduction is more readily tracked and reported by MS4 agencies. The volume reductions are actually a *water quality* improvement metric based on required pollutant reductions.

- **Compliance Targets:** for MS4 compliance determination purposes, the ultimate metric for EWMP implementation is the volume of stormwater managed by implemented control measures. The stormwater volume to be managed[6] by Carson is considered a measurable goal that will be used to assess BMP-based compliance. To support future compliance determination and adaptive management, the volume of stormwater is reported along with the capacities of control measures to be implemented by Carson in the EWMP Implementation Plan.
- **EWMP Implementation Plan:** the network of control measures that has reasonable assurance of achieving the Compliance Targets is referred to as the EWMP Implementation Plan. The identified BMPs (and BMP preferences) will likely evolve over the course of adaptive management in response to "lessons learned." As such, it is anticipated the BMP capacities within the various subcategories will be reported to the Regional Board but not tracked explicitly by the Regional Board for compliance determination. As BMPs are substituted over the course of EWMP implementation (e.g., replace green street capacity in a subwatershed with additional regional BMP capacity), the Group will show equivalency for achieving the corresponding Compliance Target.

5.2 Stormwater Control Measures to be Implemented by 2040 for Final Compliance

The EWMP will guide stormwater management in Carson for the coming decades, and the control measures to be implemented have the potential to transform communities including widespread incorporation of green infrastructure. The EWMP Implementation Plan identifies the location and type of control measures to be implemented by Carson for final compliance by 2040, which includes to addressing all Water Quality Priorities including the limiting pollutants total zinc, total nitrogen and *E. coli*. The EWMP Implementation Plan for final compliance[7] is presented as the following components:

- **Summary of total capacity of control measures to be implemented by Carson across the entire EWMP area:** bar graphs are used to summarize the control measure capacities that comprise the EWMP Implementation Plan. Shown in Figure 5-1 is the bar graph that details the various sub-categories of control measures to be implemented by Carson across its jurisdiction, compared to other jurisdictions in the DC WMG. Figure 5-2 shows the Carson control measures by Assessment Area. Figure 5-3 shows the relative capacity by different BMP types.
- **Detailed recipe for compliance including volumes of stormwater to be managed by Carson and control measure capacities:** the EWMP Implementation Plan is detailed for each

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[6] The volume is determined by reporting the amount of water that would be retained (infiltrated) by BMPs over the course of a 24-hour period under the critical 90th percentile storm condition. Additional volume would be *treated* by these BMPs, but that additional treatment is *implicit* to the reported Compliance Targets.

While the EWMP Implementation Plan reports the *total* BMP capacity to be implemented, that capacity is not a compliance target because some BMP capacities are sized to reflect a BMP program rather than sized to achieve the required reduction. For example, the BMPs implemented by the LID ordinance and the residential LID program were sized to retain the 85th percentile, 24-hour storm but that volume may be larger than is needed to achieve zinc RWLs. If those BMPs were replaced by a different type of BMP (e.g., regional BMP), the total BMP capacity may be smaller but just as effective.

[7] For the small area that drains to the LA River/Compton Creek, the final compliance date is 2037.

subwatershed in the EWMP area (generally 1 to 2 square mile drainages). Shown in Figure 5-4 is a map of the "density" of control measure capacities to be implemented to address metals and other Water Quality Priorities (through controlling zinc). Details of the map are shown in Table 5-1 through Table 5-4 (by subwatershed in each assessment area) and Table 5-5 (by milestone for all assessment areas). The tables also present the volumes of stormwater to be managed in each subwatershed (Compliance Targets) and the control measures to achieve those volume reductions (EWMP Implementation Plan). Separate Compliance Targets and EWMP Implementation Plans are provided for Metals and Other Water Quality Priorities and *E. coli*.

In addition to the scheduled stormwater capture milestones detailed in Table 5-5, planning milestones are also incorporated into the EWMP Implementation Plan. More detail on the planning milestones in Table 5-5 can be found in Section 5 of the DC EWMP. In addition, the City will also advance the planning for identified potential regional projects, as follows:

- **Carriage Crest Park project:** by December 2017, the City will have completed the following:
    - Pursuit of funding to construct the facility to manage the wet weather capture area, either through grants, loans or stormwater fees;
    - Coordination with jurisdictions in the dry weather capture area to evaluate feasibility of cost-sharing for project construction and maintenance;
    - Determination of whether the parcel adjacent to Carriage Crest Park is available for leasing or acquisition in order to site expand the project design to capture wet weather flows from the dry weather capture area
- **Civic Center project:** by December 2017, the City will have completed the following:
    - Determination of whether the site will be subject to redevelopment and
        - If so, the City will determine whether it is feasible and desirable to incorporate capacity for regional stormwater capture into the site and associated costs
        - If not, the City will further evaluate whether a regional project can be located under the existing parking lots at Civic Center, including construction costs while taking into account the long-term site disturbance that would be necessary.
    - Pursuit of funding to construct the facility, if the facilitate is determined to be feasible and desirable.

If, over the course of further planning for the Carriage Crest and Civic Center projects, it is determined the projects are not feasible or desirable, then equivalent projects will be identified in terms of stormwater managed.

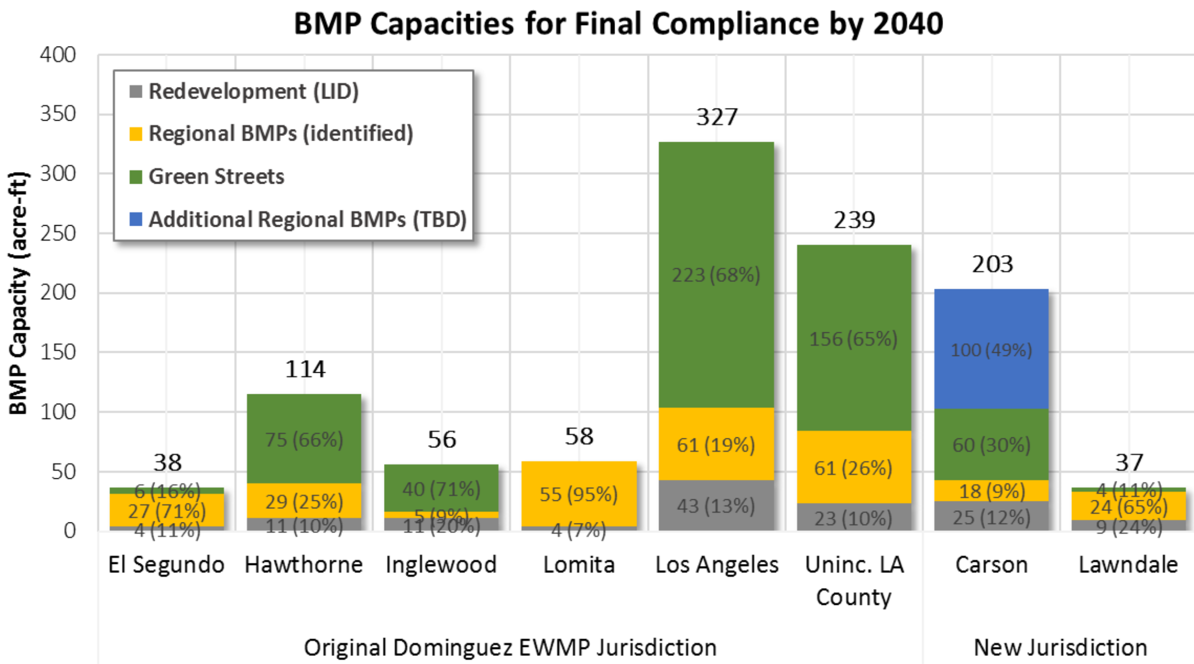

Figure 5-1. DC EWMP Implementation Plan for Final Compliance by 2040 including Carson.

This graph shows the total structural BMP capacity required for each DC EWMP jurisdiction including Carson to attain RWLs. It also shows BMP types (LID, green streets and regional BMPs). For Carson (among the new jurisdictions), additional Regional BMPs (to be determined) were shown to be needed when the screened opportunity for optimization modeling was found to be insufficient to achieve compliance targets. For the small area of Carson that drains to the LA River / Compton Creek, the final compliance date is set to 2037.

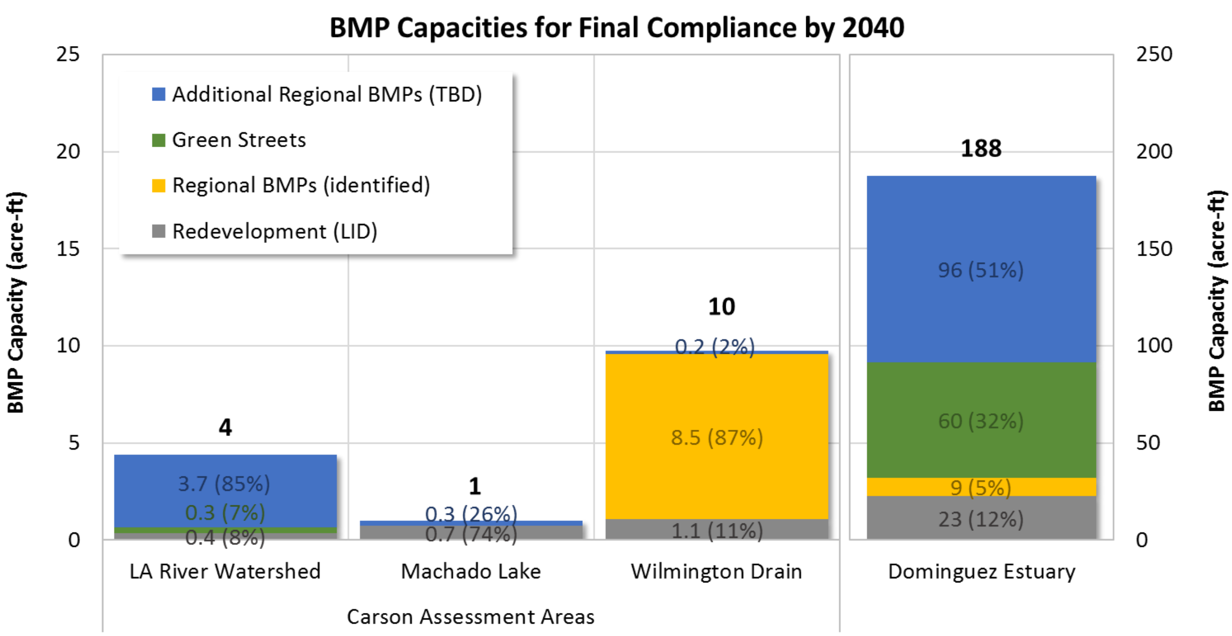

Figure 5-2. EWMP Implementation Plan for Carson for each Watershed / Assessment Area.

Note the different scale for Dominguez Estuary. For the small area of Carson that drains to the LA River / Compton Creek, the final compliance date is set to 2037.

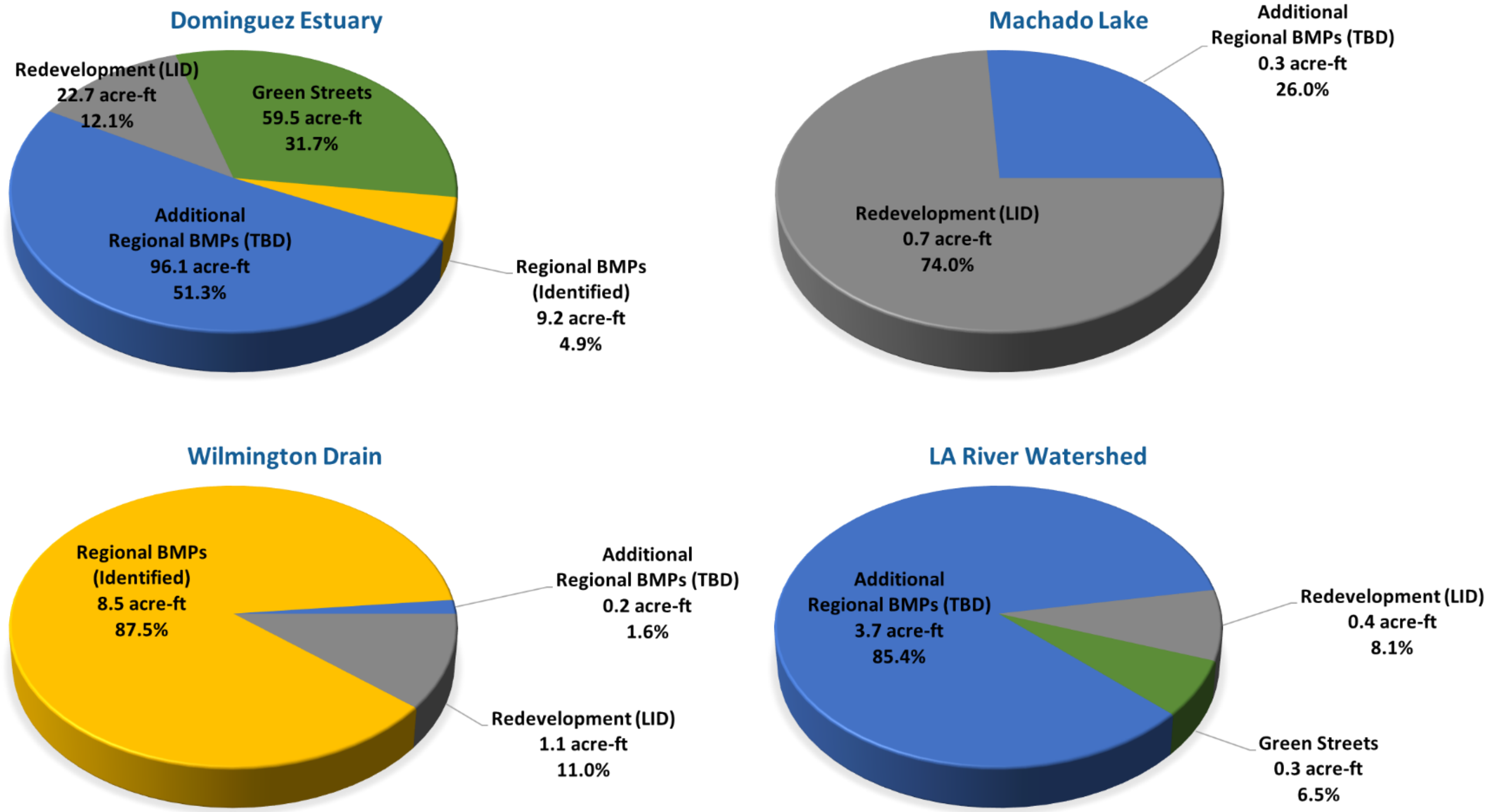

Figure 5-3. BMP distribution in Carson's EWMP Implementation Plan by watershed / assessment area.

This figure shows control measure capacity distribution for the final 2040 EWMP milestone, organized by watershed / assessment area. For the small area of Carson that drains to the LA River / Compton Creek, the final compliance date is set to 2037.

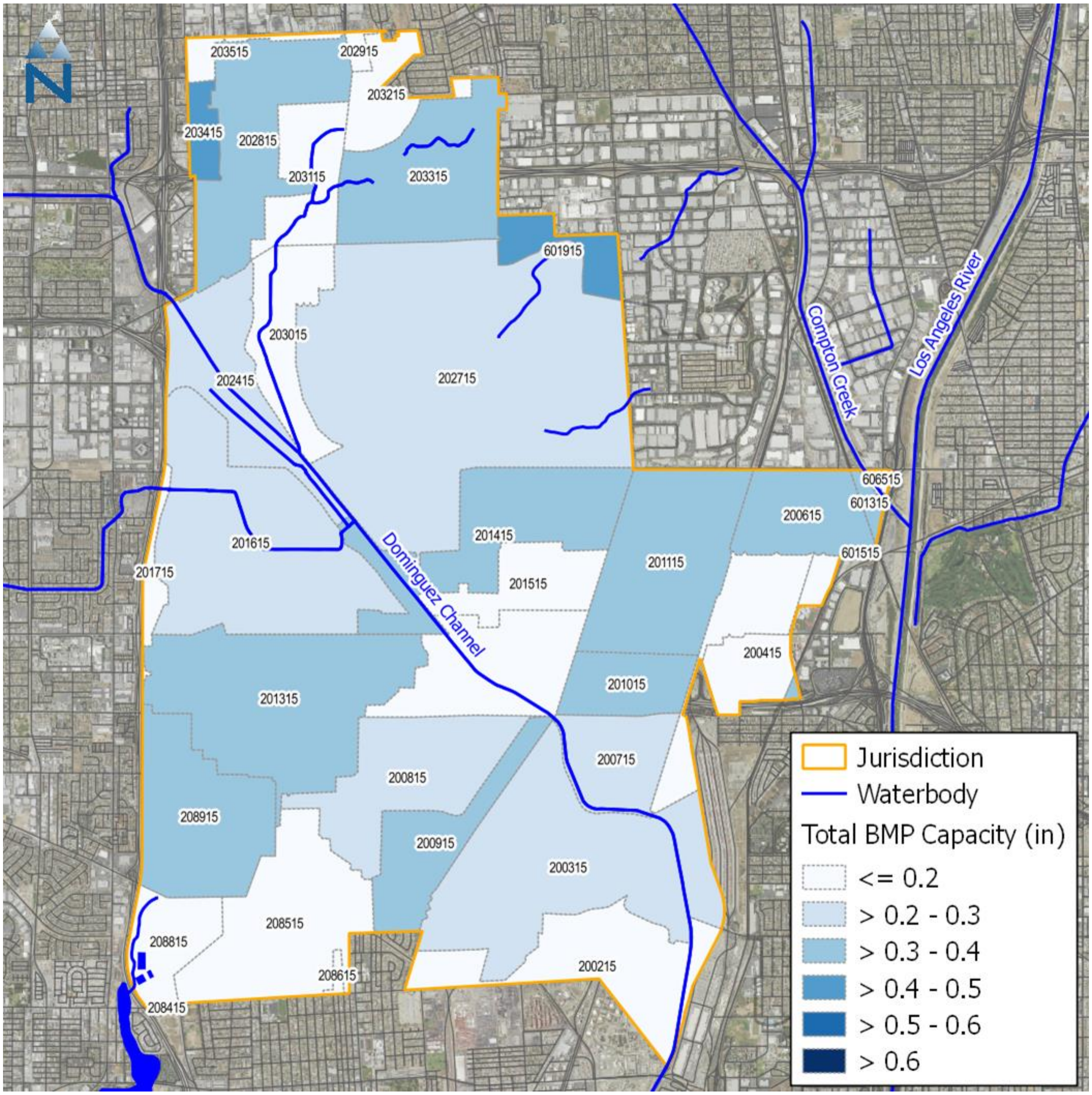

Figure 5-4. Carson EWMP Implementation Plan by subwatershed for metals and other water quality priorities (except *E. coli*).

This map presents Carson's EWMP Implementation Plan for Metals and Other Water Quality Priorities as control measure "density" by subwatershed. The BMP density is higher in some areas [dark blue] because either [1] relatively high load reductions are required or [2] BMPs in those areas were relatively cost-effective (e.g., due to high soil infiltration rates). The BMP capacities are normalized by area (i.e., the BMP capacity for each subwatershed [in units of acre-feet] was divided by the subwatershed area [in units of acres] to express the BMP capacity in units of depth [inches]). This map presents the total BMP capacity for metals attainment summarized in Table 5-1 through Table 5-4 (by subwatershed) and Table 5-5 (by milestone). Note that while each jurisdiction within an assessment area/watershed would be held to an equivalent % reduction (as the other jurisdictions), subwatersheds within an assessment area may have variable reductions based on optimization (another reason why some subwatersheds are dark blue while others are light blue).

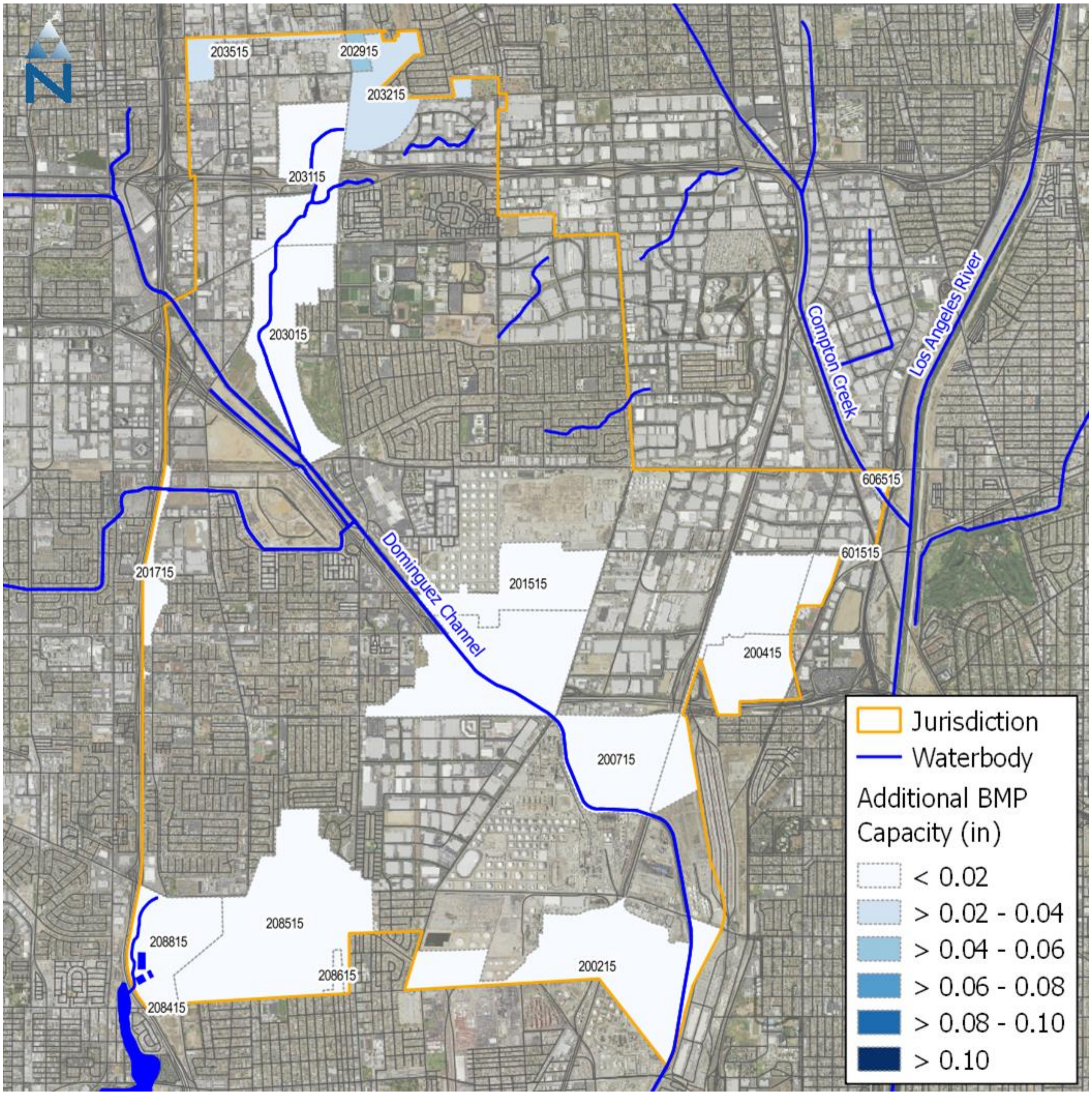

Figure 5-5. Map of additional control measures in EWMP Implementation Plan to address *E. coli.*

This map uses the same approach as Figure 5-4 to presents the additional capacity in the EWMP Implementation Plan to address E. coli (beyond the control measures to be implemented to address Metals and Other Water Quality Priorities). Note the BMP capacities are much less than in Figure 5-4 because the control measures for Metals and Other Water Quality Priorities retain much of the critical bacteria storm. Some subwatersheds are not shaded because zero additional capacity is required. These additional capacities are detailed in Table 5-1 through Table 5-4.

Table 5-1. Carson, LA River Watershed: RAA Output and EWMP Implementation Plan

Subwatershed ID	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)							
	For Toxics by 2032	For Bacteria by 2040	Metals TMDL and other WQPs by 2028						For Bacteria Attainment by 2037	
				LID	Streets	Regional BMPs				
	24-hour Volume Managed (acre-ft)	Additional 24-hour Volume Managed (acre-ft)	% Load Reduction Critical Condition	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)	Regional BMPs (additional)	Cumulative BMP Capacity for Final Compliance (acre-ft)
601315	0.87	---	73%	0.07	---	---	0.68	**0.76**	---	**0.76**
601515	0.00	0.00	45%	0.00	0.00	---	---	**0.00**	0.00	**0.00**
601715	0.02	0.01	15%	0.02	---	---	---	**0.02**	0.01	**0.03**
601915	3.96	---	85%	0.24	0.26	---	3.03	**3.53**	---	**3.53**
606515	0.05	0.01	20%	0.02	0.02	---	---	**0.05**	0.01	**0.06**
Total	**4.90**	**0.03**	**77%**	**0.36**	**0.29**	**0.00**	**3.71**	**4.35**	**0.03**	**4.38**

Table 5-2. Carson, Dominguez Estuary: RAA Output and EWMP Implementation Plan

Subwatershed ID	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)								
	For Toxics by 2032	For Bacteria by 2040	Harbor Toxics TMDL and other WQPs by 2032							For Bacteria Attainment by 2040	
				LID	Streets	Regional BMPs					
	24-hour Volume Managed (acre-ft)	Additional 24-hour Volume Managed (acre-ft)	% Load Reduction Critical Condition	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)		Regional BMPs (additional)	Cumulative BMP Capacity for Final Compliance (acre-ft)
200215	1.33	0.01	56%	0.84	0.31	---	---	**1.15**		0.01	**1.17**
200315	7.43	---	95%	1.98	0.15	---	3.77	**5.89**		---	**5.89**
200415	2.43	0.05	81%	0.21	2.01	---	---	**2.21**		0.05	**2.26**
200515	3.22	0.09	77%	0.35	2.55	---	---	**2.90**		0.09	**3.00**
200615	9.31	---	90%	0.87	1.09	---	5.89	**7.84**		---	**7.84**
200715	1.51	0.02	75%	0.83	0.47	---	---	**1.30**		0.02	**1.32**
200815	13.15	---	91%	0.88	3.18	---	5.65	**9.71**		---	**9.71**
200915	9.19	---	91%	0.58	2.02	---	4.22	**6.82**		---	**6.82**
201015	7.03	---	95%	0.93	0.28	---	4.17	**5.39**		---	**5.39**
201115	17.95	---	85%	1.81	0.64	---	12.56	**15.01**		---	**15.01**
201215	6.06	0.16	76%	1.07	3.93	---	---	**5.00**		0.16	**5.16**
201315	25.57	---	96%	0.59	1.93	9.21	9.60	**21.33**		---	**21.33**
201415	3.87	---	95%	0.91	0.56	---	1.80	**3.26**		---	**3.26**
201515	2.44	0.05	80%	0.22	2.03	---	---	**2.24**		0.05	**2.29**
201615	19.81	---	95%	1.20	8.13	---	6.53	**15.87**		---	**15.87**
201715	0.70	0.08	46%	0.39	0.25	---	---	**0.64**		0.08	**0.72**
202415	7.19	---	90%	2.39	0.53	---	3.30	**6.23**		---	**6.23**
202715	44.64	---	91%	2.11	15.89	---	19.76	**37.76**		---	**37.76**
202815	16.71	---	90%	1.63	2.73	---	9.62	**13.97**		---	**13.97**
202915	0.09	0.06	20%	0.05	0.03	---	---	**0.08**		0.06	**0.14**

Subwatershed ID	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)							
	For Toxics by 2032	For Bacteria by 2040	Harbor Toxics TMDL and other WQPs by 2032						For Bacteria Attainment by 2040	
				LID	Streets	Regional BMPs				
	24-hour Volume Managed (acre-ft)	Additional 24-hour Volume Managed (acre-ft)	% Load Reduction Critical Condition	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)	Regional BMPs (additional)	Cumulative BMP Capacity for Final Compliance (acre-ft)
203015	1.94	0.07	82%	0.09	1.74	---	---	**1.82**	0.07	**1.90**
203115	2.96	0.21	67%	0.40	2.23	---	---	**2.62**	0.21	**2.83**
203215	1.69	0.28	55%	0.25	1.29	---	---	**1.54**	0.28	**1.81**
203315	15.29	---	95%	1.76	5.19	---	6.38	**13.32**	---	**13.32**
203415	2.51	---	90%	0.26	0.14	---	1.69	**2.09**	---	**2.09**
203515	0.38	0.13	30%	0.10	0.24	---	---	**0.34**	0.13	**0.47**
Total	**224.41**	**1.21**	**88%**	**22.68**	**59.52**	**9.21**	**94.92**	**186.33**	**1.21**	**187.55**

Table 5-3. Carson, Machado Lake: RAA Output and EWMP Implementation Plan

Subwatershed ID	COMPLIANCE TARGET: BMP PERFORMANCE GOAL	EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	For Bacteria by 2040	For Bacteria Attainment by 2040				
		LID	Streets	Regional BMPs		Total BMP Capacity (acre-ft)
	24-hour Volume Managed (acre-ft)	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	
208415	0.00	0.00	---	---	0.00	**0.01**
208515	0.63	0.73	---	---	0.61	**1.34**
208615	0.01	0.01	---	---	0.00	**0.01**
Total	**0.64**	**0.74**	**0.00**	**0.00**	**0.61**	**1.00**

Table 5-4. Carson, Wilmington Drain: RAA Output and EWMP Implementation Plan

Subwatershed ID	COMPLIANCE TARGET: BMP PERFORMANCE GOAL	EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	For Bacteria by 2040	For Bacteria Attainment by 2040				
		LID	Streets	Regional BMPs		Total BMP Capacity (acre-ft)
	24-hour Volume Managed (acre-ft)	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	
208815	0.17	0.62	---	---	0.15	**0.77**
208915	0.40	0.45	---	8.5	---	**8.95**
Total	**0.57**	**1.07**	**0.00**	**8.5**	**0.15**	**9.72**

Table 5-5. Carson: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID: Redevelop-ment	Streets: Green Streets	Regional BMPs: Regional BMPs (identified)	Regional BMPs: Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)
LA River Watershed	31% Milestone (2017)	1.4	0.2	0.3	---	0.8	**1.3**
	50% Milestone (2024)	2.5	0.3	0.3	---	1.7	**2.2**
	Final Metals (2028)	4.9	0.4	0.3	---	3.7	**4.4**
	Final Bacteria (2037)	4.9	0.4	0.3	---	3.7	**4.4**
Dominguez Estuary	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1]. Also see regional BMP milestones in Section 5.2 of this addenda (p. 25)					
	50% Milestone (2026)	73.0	9.3	40.6	9.2	---	**59.2**
	75% Milestone (2029)	159.8	17.7	59.5	9.2	45.1	**131.5**
	Final Metals (2032)	224.4	22.7	59.5	9.2	94.9	**186.3**
	Final Bacteria (2040)	225.6	22.7	59.5	9.2	96.1	**187.5**
Machado Lake	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1]. Also see regional BMP milestones in Section 5.2 of this addenda (p. 25)					
	Final Bacteria (2040)	0.6	0.7	---	---	0.3	**1.0**
Wilmington Drain	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1]. Also see regional BMP milestones in Section 5.2 of this addenda (p. 25)					
	Final Bacteria (2040)	0.6	1.1	---	8.5	0.2	**9.7**
Total	---	**226.8**	**24.9**	**59.5**	**17.7**	**100.3**	**202.9**

1 – In response to comments from the Regional Board on the DC EWMP, the EWMP is incorporating planning milestones for structural control measures. Those milestones will be into the revised DC EWMP, to be submitted to the Regional Board in early 2016.

6 ADAPTIVE MANAGEMENT FRAMEWORK

Refer to Section 6 of the DC EWMP for details regarding adaptive management. In general, over time the monitoring data will be used to refine the estimated pollutant reductions and selected BMPs for implementation will evolve. As BMPs are "substituted", Carson will demonstrate equivalent performance for achieving the volume-based Compliance Targets.

7 IMPLEMENTATION COSTS & FINANCIAL STRATEGY

This section presents costs for constructing the control measures in the EWMP Implementation Plan, along with the financial strategy for addressing those costs. For the purposes of the EWMP, the financial strategy is defined as the strategic options available to the Group members for financing the program costs associated with the MS4 Permit. The section provides an overview of the following components of the EWMP financial strategy:

- Estimated EWMP Costs (Section 7.1)
- Financial Strategy (Section 7.2)

7.1 Estimated EWMP Costs

Order-of-magnitude cost estimates were generated for Carson's EWMP Implementation Plan. The general approach for developing cost estimates is based on "cost functions" shown in Table 7-1, which describe cost as a function of BMP size parameters (e.g. volume, depth, area). These cost functions were applied to the quantity of each category of control measure presented in Section 5 (Table 5-1 through Table 5-5) by milestone. Cost functions for the Regional BMPs were derived from other detailed regional BMP cost estimates generated for the DC EWMP, including the concept design for the Carriage Crest Park regional stormwater facility presented in Section 3.1.2. Cost functions for Green Streets are consistent on a volumetric basis with those used for the DC EWMP.

Both lower-bound and upper-bound estimated capital costs for all control measures in the EWMP Implementation Plan (LID, Green Streets, and Regional) are shown in Table 7-2 and Table 7-3. The cost per volume capacity for regional BMPs was assumed to be $950,000 per acre-foot, and $48 per cubic foot for green streets. The upper-bound cost estimate incorporates the optional term in the Additional Regional BMP cost function describing private land acquisition at approximately $5.6M per acre (see Table 7-1). While this upper-bound cost estimate acknowledges uncertainty surrounding potential BMP site that have yet to be determined, these facilities may or may not require land acquisition depending on the nature of future opportunities identified by Carson. The capital costs are reported for the same milestones detailed in Section 5 of the DC EWMP. The implementation cost schedule relies on initial capital costs to achieve the control measure capacities at the milestone year.

Figure 7-1 and Figure 7-2 presents summaries of annual and cumulative capital costs over the duration of the compliance timeframe between 2017 and 2040. Annual operation and maintenance costs (O&M) were estimated consistent with the methodologies presented in Section 7 of the DC EWMP, and are projected in Figure 7-1 and Figure 7-2. Annual O&M costs for Regional Projects was estimated at 1.5% of construction cost, and annual O&M costs for Green Streets was estimated at 1% of construction cost.

It is imperative to note that the costs for structural BMPs provided here are considered to be planning-level only (order of magnitude), and can be refined as EWMP implementation progresses with the use of actual BMP implementation costs. Costs for enhanced MCMs, Re-Development LID and other institutional BMPs have not been included here and are in addition to the Capital and O&M costs.

Table 7-1. Summary of Annualized BMP Cost Estimation Formulas (ULAR Group, 2015)

BMP Type	Formula for Estimating Capital Cost ($)
Redevelopment (LID)	--
Green Streets	Cost = 47.77 (V_t)
Regional BMPs (identified)	Cost = 21.81 (V_t)
Additional Regional BMPs (TBD)	Cost = 21.81 (V_t) + [129.01 (A)][1]

Note: (V_t) is the total storage volume of the BMP in cubic feet
1: Optional Term represents $129.01/square foot to account for private land acquisition costs where needed.
Source: ULAR Group 2015.

Table 7-2. Summary of Carson cumulative Capital Cost by Milestone (lower-bound estimate, excluding land acquisition for additional regional BMPs)

Area / BMP Category		50% Milestone (2026)	75% Milestone (2029)	Final Metals (2032)	Final Bacteria (2040)
Compton Creek [1]	Redevelopment (LID)	--	--	--	--
	Green Streets	$595,084	$595,084	$595,084	$595,084
	Regional BMPs	--	--	--	--
	Additional Regional	$719,080	$1,600,433	$3,525,475	$3,551,462
Dominguez Estuary	Redevelopment (LID)	--	--	--	--
	Green Streets	$84,488,498	$123,855,219	$123,855,219	$123,855,219
	Regional BMPs	$8,749,500	$8,752,370	$8,752,370	$8,752,370
	Additional Regional	--	$42,807,230	$90,172,209	$91,324,643
Machado Lake	Redevelopment (LID)	--	--	--	--
	Green Streets	--	--	--	--
	Regional BMPs	--	--	--	--
	Additional Regional	--	--	--	$579,500
Wilmington Drain	Redevelopment (LID)	--	--	--	--
	Green Streets	--	--	--	--
	Regional BMPs	--	--	--	$8,822,385
	Additional Regional	--	--	--	$146,737
Total Cost		**$94,552,162**	**$177,610,336**	**$226,900,357**	**$237,627,400**

1: Milestones for the Compton Creek assessment area follow the schedule from the ULAR EWMP with 31%, 50% and Final milestones for metals in 2017, 2024 and 2028, respectively. The Final Bacteria milestone is in 2037. For presentation in the table, costs have been aligned with the DC EWMP milestones.

Table 7-3. Summary of Carson cumulative Capital Cost by Milestone (upper-bound estimate, including land acquisition for additional regional BMPs)

Area / BMP Category		50% Milestone (2026)	75% Milestone (2029)	Final Metals (2032)	Final Bacteria (2040)
Compton Creek [1]	Redevelopment (LID)	--	--	--	--
	Green Streets	$595,084	$595,084	$595,084	$595,084
	Regional BMPs	--	--	--	--
	Additional Regional	$2,136,974	$4,756,193	$10,477,064	$10,554,292
Dominguez Estuary	Redevelopment (LID)	--	--	--	--
	Green Streets	$84,488,498	$123,855,219	$123,855,219	$123,855,219
	Regional BMPs	$8,749,500	$8,752,370	$8,752,370	$8,752,370
	Additional Regional	--	$127,215,210	$267,975,214	$271,400,036
Machado Lake	Redevelopment (LID)	--	--	--	--
	Green Streets	--	--	--	--
	Regional BMPs	--	--	--	--
	Additional Regional	--	--	--	$1,722,167
Wilmington Drain	Redevelopment (LID)	--	--	--	--
	Green Streets	--	--	--	--
	Regional BMPs	--	--	--	$8,822,385
	Additional Regional	--	--	--	$436,075
Total Cost		**$95,970,056**	**$265,174,076**	**$411,654,951**	**$426,137,628**

1: Milestones for the Compton Creek assessment area follow the schedule from the ULAR EWMP with 31%, 50% and Final milestones for metals in 2017, 2024 and 2028, respectively. The Final Bacteria milestone is in 2037. For presentation in the table, costs have been aligned with the DC EWMP milestones.

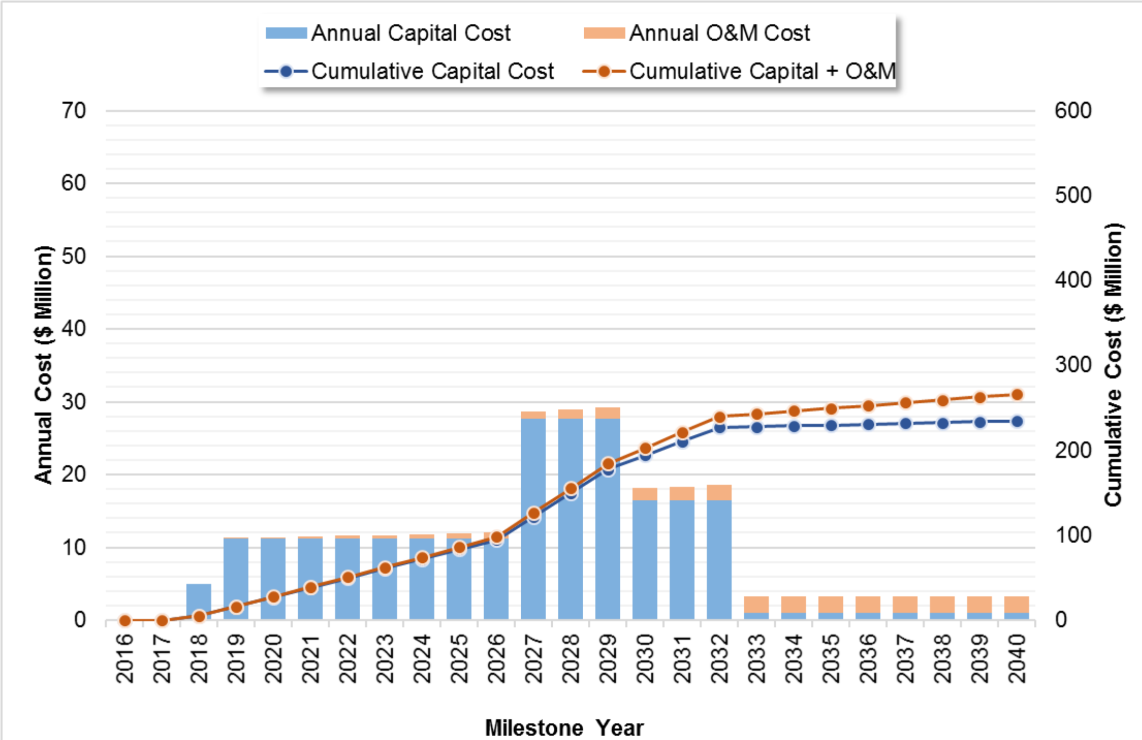

Figure 7-1. Summary of Carson implementation cost distribution (lower bound, excluding land acquisition for additional regional BMPs) over compliance timeframe.

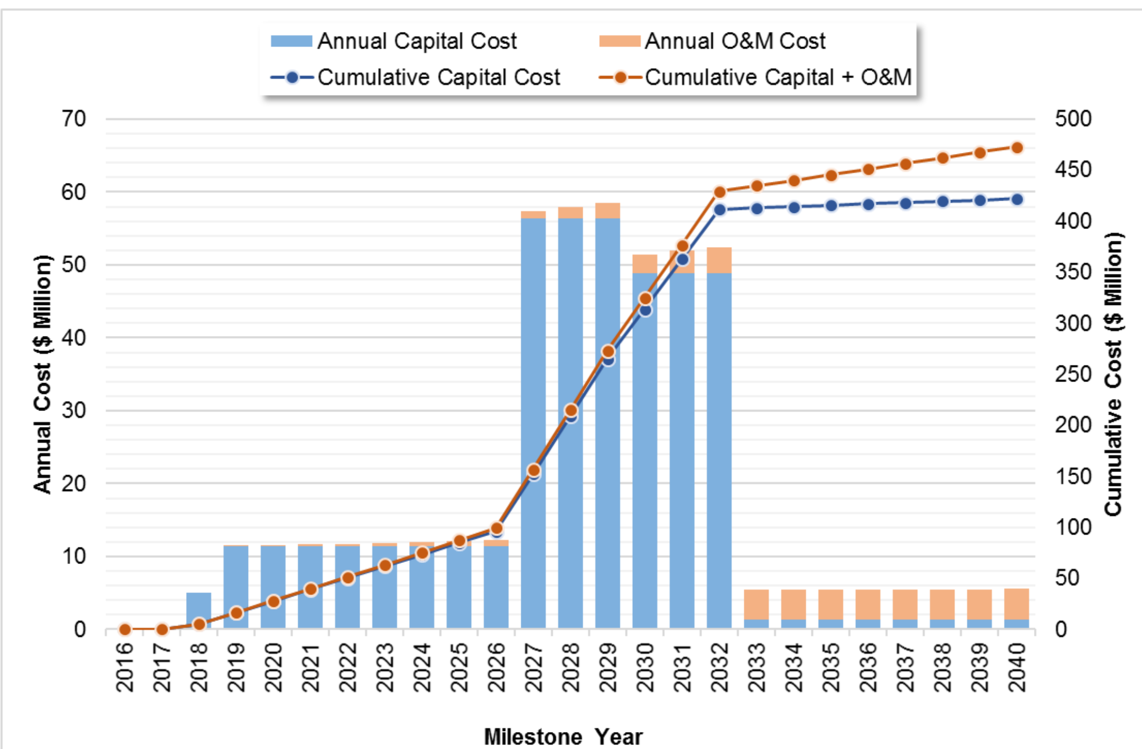

Figure 7-2. Summary of Carson implementation cost distribution (upper bound, including land acquisition for additional regional BMPs) over compliance timeframe.

7.2 Financial Strategies

Financial strategies and funding sources for the City of Carson are consistent with those identified in Section 7 of the DC EWMP.

8 REFERENCES

ULAR Group (Upper Los Angeles River EWMP Group). 2015. *DRAFT Enhanced Watershed Management Program.* Prepared by the Upper Los Angeles River EWMP Group. Submitted June 2015.

Addendum to Enhanced Watershed Management Program for the Dominguez Channel Watershed Management Area Group:

Incorporation of City of Lawndale

FEBRUARY 12, 2015

PREPARED FOR:

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1 INTRODUCTION

This appendix presents an addendum to incorporate the City of Lawndale (Lawndale) into the Enhanced Watershed Management Program for the Dominguez Channel Watershed Management Area Group (DC EWMP). The draft DC EWMP submitted in June 2015 by the Dominguez Channel Watershed Management Area Group (DC WMG) included the cities of Los Angeles, El Segundo, Hawthorne, Inglewood, and Lomita and the County of Los Angeles and the Los Angeles County Flood Control District (LACFCD). On August 12, 2015 Lawndale provided a Notice of Intent to join the DC EWMP to the Los Angeles Regional Water Quality Control Board (Regional Board).[1] This addendum provides the analysis needed to fully incorporate Lawndale into the DC EWMP and presents the EWMP Implementation Plan for Lawndale. Through submittal of this addendum, Lawndale will receive the compliance benefits provided by the MS4 Permit for jurisdictions that develop Enhanced Watershed Management Programs. The revised extent of the DC WMG is presented in Figure 1-1 after the incorporation of the cities of Lawndale and Carson. Shown in Table 1-1 is a summary of the relative jurisdictional areas after incorporation of Lawndale and Carson into the DC WMG, and Figure 1-1 shows the jurisdictional boundaries of the DC WMG and the major tributary/assessment areas for the DC EWMP.

This addendum is focused on the Lawndale-specific analyses to incorporate the City of Lawndale into the DC EWMP. When possible, the reader is referred to the DC EWMP for details on methodology and analyses that apply to the entire DC EWMP Group. To support review of this document, the format and organization of this addendum follows the DC EWMP. When a cross-reference within this addendum refers to a section of the main body of the DC EWMP, the reference includes "of the DC EWMP". Otherwise, the cross-reference is referring to a section within this addendum.

Table 1-1. Summary of DC WMG Member Jurisdictional Areas

DC WMG Member	Total Area (acres)	Percent of Group [2]
City of Carson	11,942.9	23.5%
City of El Segundo [1]	1,252.2	2.5%
City of Hawthorne [1]	3,891.9	7.7%
City of Inglewood [1]	3,884.3	7.6%
City of Lawndale	1,259.5	2.5%
City of Lomita [1]	1,227.7	2.4%
City of Los Angeles [1]	19,177.3	37.8%
Los Angeles County [1]	8,140.9	16.0%
LACFCD	n/a	n/a
Total	**50,776.7**	**100.0%**

1: Total area as presented in Section 1 of the DC EWMP
2: Percent of Group re-calculated based on total area after including the Cities of Carson and Lawndale

[1] The City of Carson submitted an NOI on August 26, 2015 and is incorporated through a separate addendum.

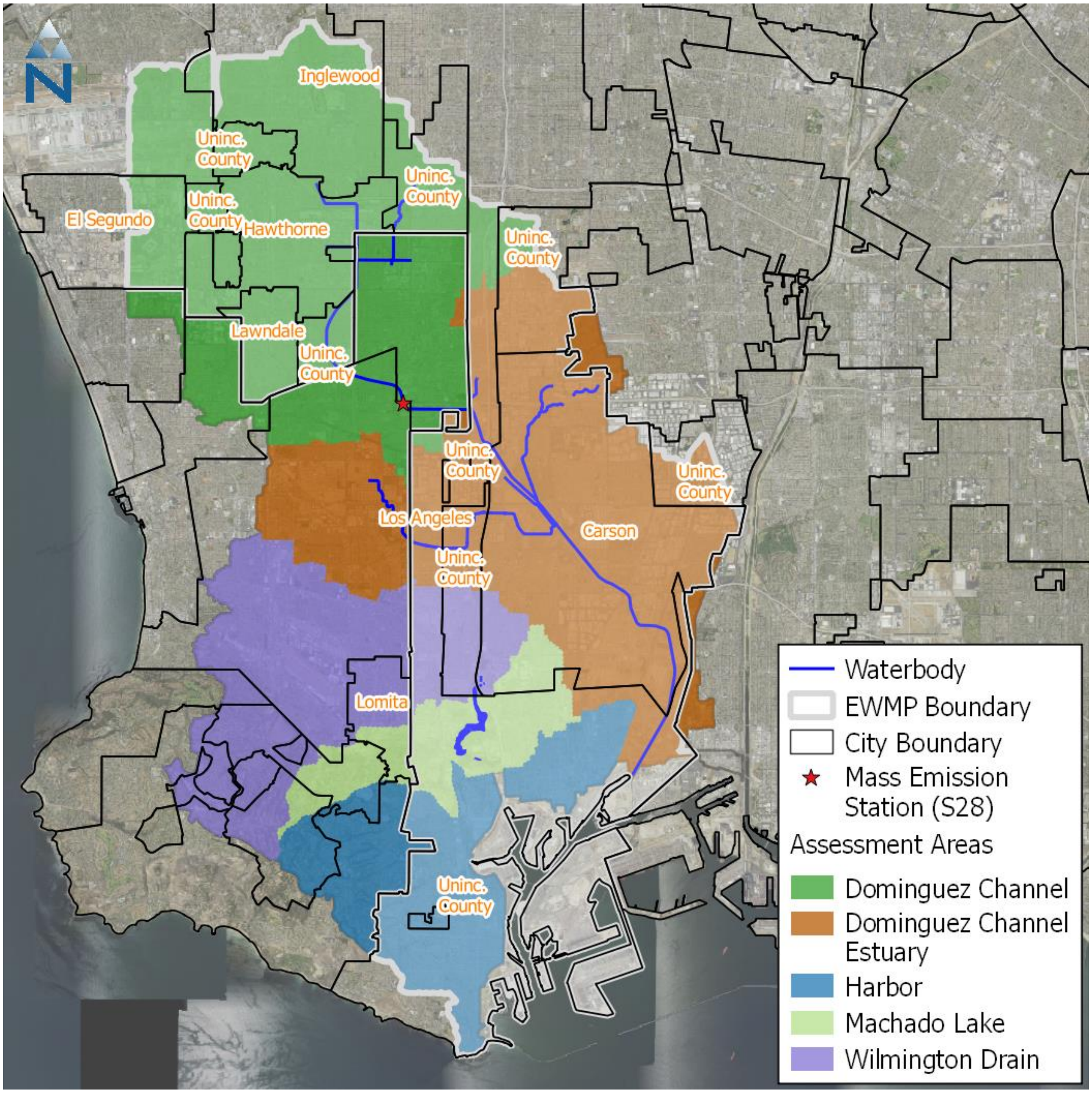


Figure 1-1. Jurisdictional boundaries and tributary areas of the DC WMG after incorporation of Lawndale and Carson.

2 WATER QUALITY PRIORITIES

Lawndale is located within the Dominguez Channel Watershed Management Area, which was analyzed in Water Quality Priorities section (Section 2) of the DC EWMP. The receiving waters for Lawndale is the freshwater portion of Dominguez Channel above Vermont Avenue. This receiving water body was fully evaluated in the DC EWMP. The Water Quality Priorities for Dominguez Channel (lined portion above Vermont Avenue) are presented in Section 2 of the DC EWMP. The inclusion of Lawndale does not necessitate any additional Water Quality Priorities (TMDLs, 303(d) listings, or otherwise). The primary Water Quality Priorities that drive the watershed control measures for Lawndale are zinc (Category 1 Water Quality Priority) and indicator bacteria (Category 2 Water Quality Priority). As demonstrated in subsequent sections, by addressing these two Water Quality Priorities, the other Water Quality Priorities will also be addressed.

3 WATERSHED CONTROL MEASURES

The Permit requires the identification of Watershed Control Measures, which are strategies, institutional measures, and BMPs[2] that will be implemented through the EWMP individually or collectively at a watershed-scale to address Water Quality Priorities. Section 3 of the DC EWMP describes the categories of BMPs used to develop the DC EWMP (and simulated by the RAA), summarizes existing and planned structural BMPs, and describes the institutional control measures that will be implemented including customization of MCMs.

Two overarching categories of BMPs are discussed throughout the EWMP:

- **Structural BMPs**: these BMPs retain, divert or treat stormwater and/or non-stormwater, and can either be distributed throughout the watershed or sited regionally.
- **Institutional BMPs:** these BMPs encompass the Minimum Control Measures (MCMs) outlined in the permit, other non-structural BMPs, and any other source control measures, such as community education programs.

Furthermore, the three main sub-categories of structural BMPs incorporated into the EWMP include low-impact development (LID), green streets, and regional projects, as defined below:

- **Low impact development (LID):** Distributed structural practices intended to treat runoff relatively close to the source and typically implemented at a single-parcel- or few-parcel level (normally less than 10 tributary acres).
- **Green streets:** Distributed structural practices intended to treat runoff within public transportation rights-of-way (normally less than 10 tributary acres).
- **Regional BMPs:** Constructed structural practices intended to treat runoff from a contributing area of multiple parcels (normally on the order of 10s or 100s of acres or larger).

Lawndale evaluated the menu of control measures used for development of the DC EWMP and determined which of the institutional and structural control measures are best suited for its stormwater program. The menu of institutional, LID, green street and regional project control measures selected by Lawndale is summarized in Table 3-1. Additional information regarding the selected control measures are provided in the following subsections, organized by control measure type.

[2] In this EWMP, the terms “control measures” and “best management practices (BMPs)” are used interchangeably.

Table 3-1. Summary of Control Measures Selected by City of Lawndale for EWMP Development

Control Measure Type	Control Measure Subcategory for EWMP / RAA	Incorporation Approach for EWMP for Lawndale
Institutional	Enhanced institutional	5% baseline for 2012 Permit MCMs, plus additional 5% reduction due to catch basin inserts and/or enhanced street sweeping
LID	Planned & Existing Projects	Yes, these projects were determined to already be incorporated into the baseline for the DC EWMP (constructed prior to 2011)
	New & Re-Development	Yes, incorporated based on projected growth rates
Green streets	Green streets with permeable pavement and/or alternative infiltration strategies	Yes, incorporated suitable streets as opportunities for green streets
Regional projects	Public Regional (identified)	Yes, three (3) major regional BMP opportunities are incorporated into EWMP
	Additional Regional (to be determined)	Yes, incorporated Additional Regional into RAA, as necessary, to provide assurance that load reductions can be achieved.

3.1 Lawndale Regional Projects

The screening process similar to the one described in the DC EWMP was used to identify potential suitable parcels for siting regional projects in Lawndale. This similar screening process followed Steps 1-6 presented in Section 4 of the DC EWMP where tax exempt parcels are identified based on the Assessor Identification Number (AIN). These parcels all end with a 3-digit number in the 900's. Tax exempt parcels were grouped into tiers representing how closely-held the property is by the City of Lawndale parcels. Parcels less than 0.25 acres or that are part of a waterway were excluded. Remaining parcels were evaluated by Lawndale to identify a list of potential regional projects, and each potential parcel was included or excluded based on their local knowledge of the sites, ownership, logistics, etc.

3.1.1 Regional Projects on Public Parcels

Regional project opportunities were identified using a detailed spatial analysis, beginning with an initial screening based on potential constraints, and culminating with an identification of publically-owned parcels potentially suitable for regional projects. Based on the screening analysis, multiple sites were identified as potentially suitable for potential regional projects on public parcels. However, a single regional project at Alondra Park was identified to potentially manage all runoff from within the

City (as well as DC WMG areas outside of Lawndale), preventing the need for other regional projects within the city. Table 3-2 summarized the Alondra Park regional BMP opportunity incorporated into the RAA model for Lawndale. Figure 3-1 shows Alondra Park site location and the drainage area within the City of Lawndale. This regional project was not subject to concept design; instead, preliminary coarse design parameters were assumed based on an initial evaluation of the site using readily available desktop GIS data sets. During EWMP implementation, the design details for this regional project would be further refined. During adaptive management, this project design could be modified, supplemented by additional projects, or replaced entirely by other projects, as long as the equivalent water quality benefit is achieved overall.

Table 3-2. Summary of Identified Regional BMP for Lawndale

Description	Address	Approximate Location (Lat/Long)	Approximate Available Footprint (acres)	Potential Upstream Area to be Intercepted (acres)	Design Storm Rainfall (inches)
Alondra Park	3850 Manhattan Beach Blvd, Lawndale, CA 90260	33 53’ 12.4” N 118 20’ 34.3” W	6.7	3,461	0.93

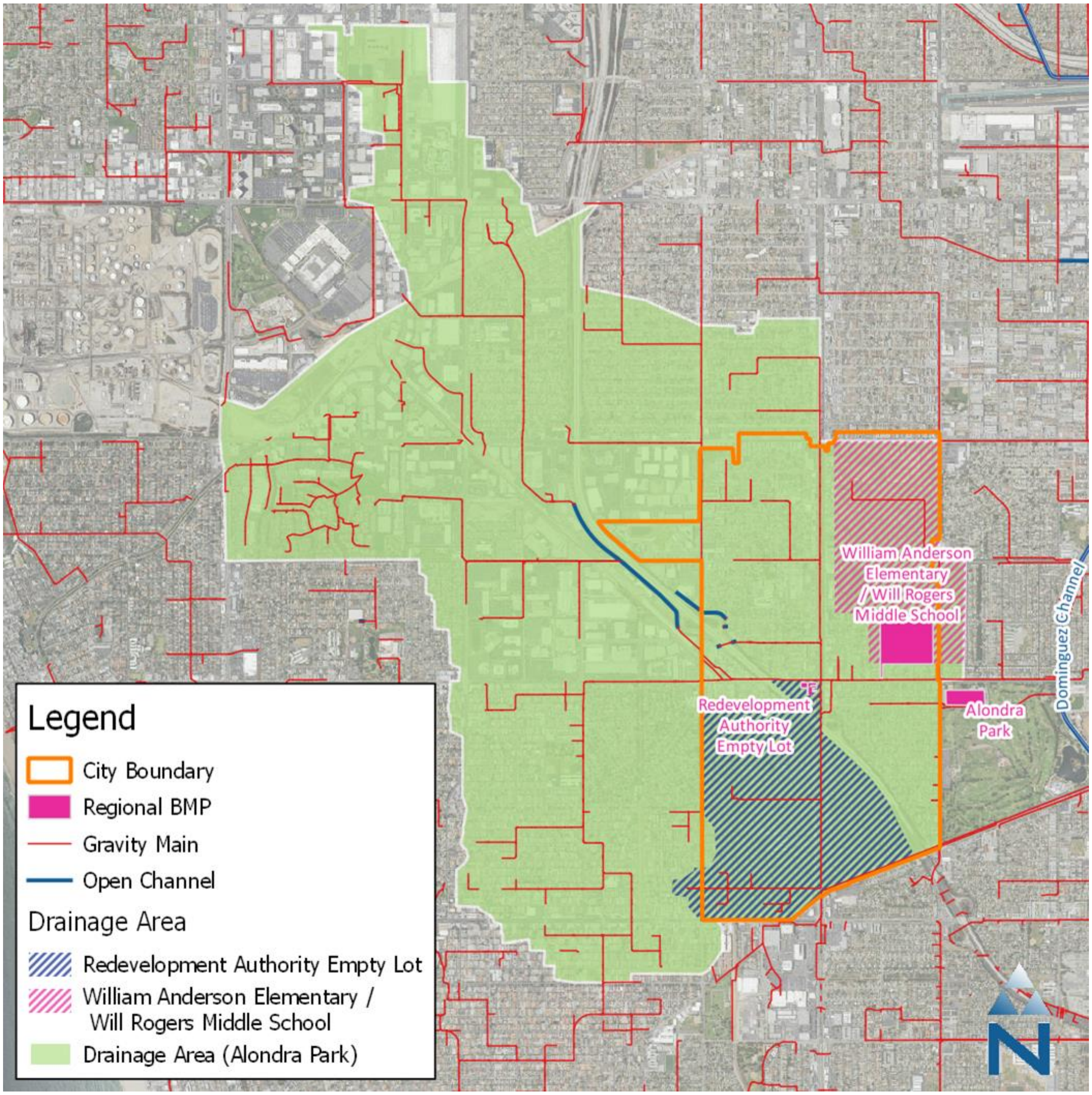


Figure 3-1. Regional BMP Opportunities Identified in Lawndale.

3.2 LID Programs

A key element of the structural BMP strategy for the DC EWMP is to assume that LID will be distributed throughout the watershed. For the purposes of this EWMP, it is assumed that LID is defined as a series of distributed structural practices that capture, infiltrate and/or treat runoff at the parcel scale. Common LID practices include bioretention, permeable pavement and other infiltration BMPs that manage runoff at the source. Rainfall harvest practices such as cisterns can also be used to capture rainwater that would otherwise run off a parcel and offset potable water demands. For the RAA, and in accordance with the City's LID ordinance, LID BMPs are designed to capture the 85th percentile storm from the parcels on which they are located.

Figure 3-2 shows the extent of LID opportunities throughout Lawndale while the following summarizes key details about each of the LID program components:

- LID due to Redevelopment – the most widespread LID for the EWMP Implementation Plan is LID due to redevelopment (funded by the developer). Average annual redevelopment rates released by the City of Los Angeles were used to project the area that is expected to be developed, as presented in Table 4-5 of the DC EWMP. The projected benefit of LID due to development in terms of water quality and stormwater capture was incorporated into the EWMP.
- Existing and Planned BMPs –Lawndale completed the Rogers Park Improvement Project in August 2014, installing below grade retention to capture three quarters of an inch of rain. This project is co-located at the William Anderson Elementary/Will Rogers Middle School identified for a potential regional project in Section 3.1. This LID project is incorporated into the EWMP. Other existing BMPs were determined to be a part of the baseline water quality and not explicitly included.

Note that Figure 3-2 shows the assumed LID BMP *opportunities*; the actual *capacity* of LID control measures projected to be implemented by developers is presented in Section 5.

3.3 Green Streets

The Permit specifies that EWMPs should "incorporate effective technologies, approaches and practices, including green infrastructure." Rights-of-way along streets may be the most extensive opportunity for the DC WMG to implement green infrastructure on public land. In developed areas, curb and gutter in the road provides the primary means of conveying stormwater (and associated pollutants) directly to storm drain inlets and receiving waters. Green streets provide an opportunity to intercept this runoff prior to entering the MS4 and treat it within the public right-of-way. Green streets are typically implemented as linear bioretention/biofiltration practices installed parallel to roadways. Systems receive runoff from the gutter via curb cuts or curb extensions (sometimes called bump outs) and infiltrate it through native or engineered soil media. Permeable pavement can also be implemented in tandem, or as a standalone practice, in parking lanes of roads.

Green streets have been demonstrated to provide "complete streets" benefits in addition to stormwater management, including pedestrian safety and traffic calming, street tree canopy and heat island effect mitigation, increased property values and even reduced crime rates. As with LID, green streets tend to be distributed practices that are deployed throughout a watershed to treat runoff near the source. Key advantages of green streets are that they are located on land directly controlled by public entities, and can intercept runoff from larger upstream drainage areas when compared to LID projects.

The methods for screening potential street opportunities is described in Attachment R of the DC EWMP. Screening for green street opportunity throughout Lawndale followed a similar procedure by filtering out suitable road functional classes based on the Census 2010 TIGER roads data set. When applied to Lawndale, this screening procedure identified over 35 lane miles of *potential* frontage length for green streets, as shown in Figure 3-2. Note that Figure 3-2 shows the green street BMP *opportunities* (suitable streets); the *capacity* of green streets to be implemented for Lawndale's EWMP Implementation Plan (per the RAA) is presented in Section 5.

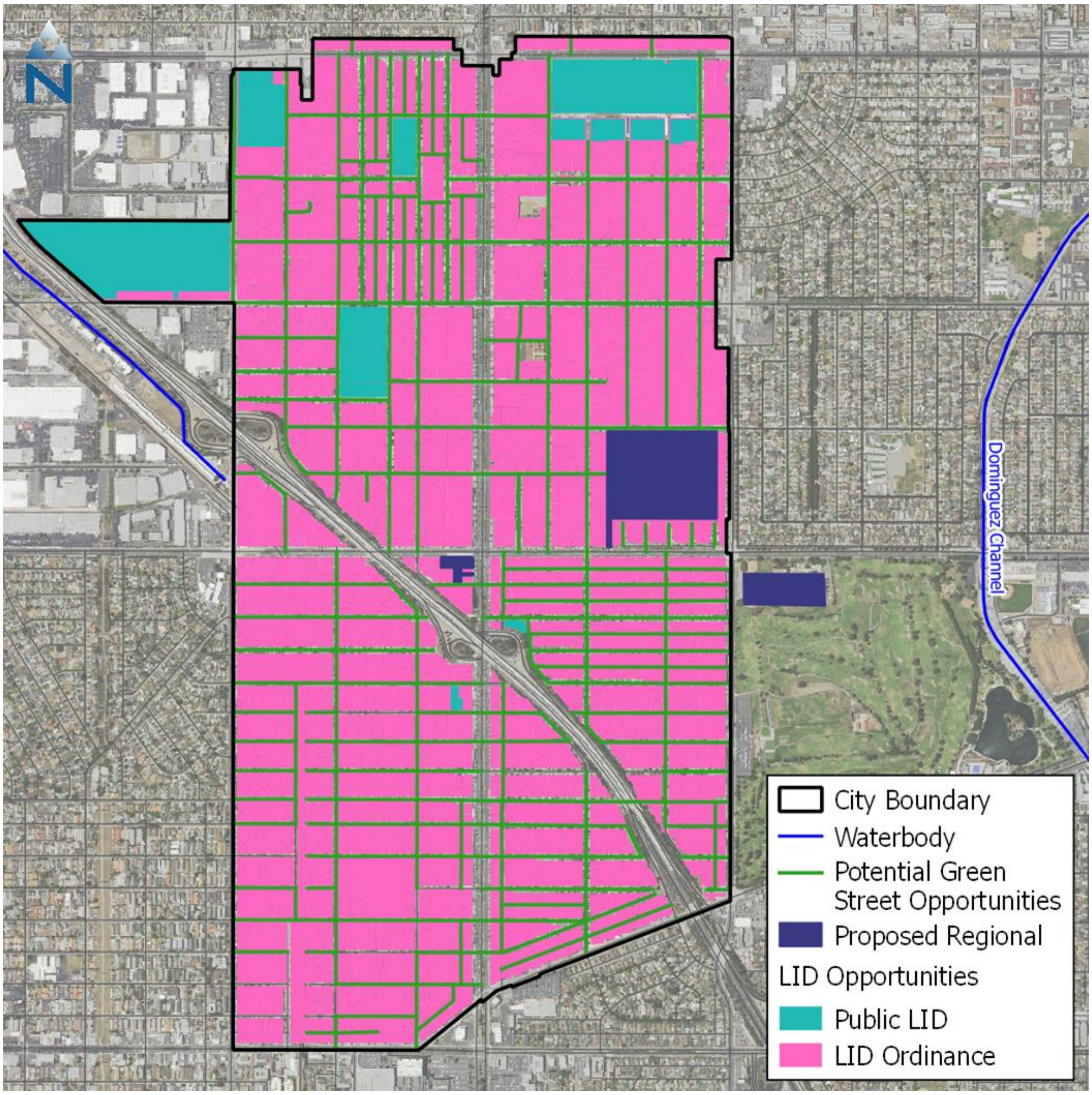


Figure 3-2. Opportunities for LID Identified in Lawndale.

3.4 Institutional BMPs

Institutional BMPs are a fundamental component of Lawndale's stormwater program, including the MCMs required by the Permit. For development of this initial EWMP, Lawndale has elected to not customize the baseline MCMs in the 2012 Permit. Consistent with the DC EWMP, the Lawndale RAA assumes that implementation of the MCMs in the 2012 Permit will represent a 5% increase in pollutant reduction when compared to the MCMs under the previous Permit (see Section 4.1 of the EWMP). In addition, Lawndale will be implementing additional institutional control measures to achieve at least an additional 5% reduction, for a total of 10% reduction due to institutional control measures, including the following:

- The City began having its streets swept using regenerative air street sweepers during the current permit term, which represents in increased pollutant reduction above and beyond the baseline.
- Installation of trash excluders on or in its Priority A catch basins in 2017. This will also increase the inspection and potential clean out of these catch basins.

- Implementation of a program to monitor the trash in the areas of the Priority A catch basins and increase the frequency of street sweeping in these areas if deemed necessary.

During adaptive management, Lawndale may identify additional institutional control measures to reduce pollutants and incorporate them into the EWMP (perhaps including higher % reductions than 10%).

4 REASONABLE ASSURANCE ANALYSIS

A key element of the EWMP is the RAA, which is prescribed by the Permit as a process to demonstrate "that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term" (Permit section C.5.b.iv.(5), page 63 – RWQCB, 2012). While the Permit prescribes the RAA as a quantitative demonstration that control measures will be effective, the RAA also promotes a modeling process to support the DC WMG with selection of control measures. In particular, the RAA was used to evaluate the many different scenarios/combinations of LID, green streets and regional BMPs (as described in Section 3) that could potentially be used by Lawndale to comply with the RWLs and WQBELs of the Permit. The RAA modeling system was then used to select the control measures that are most cost-effective for achieving the required pollutant reductions. The selected control measures are referred to as the "EWMP Implementation Plan" for Lawndale (described in Section 5).

The RAA for Lawndale follows the framework established in Section 3 of the DC EWMP. In 2014, the Regional Board issued RAA Guidelines (RWQCB, 2014), which outline expectations for developing RAAs, and those guidelines were followed closely during development of this RAA. This section presents some of the key metrics associated with the RAA, including required pollutant reductions for Lawndale receiving waters. As possible, details of the RAA are not repeated here. Instead, the reader should refer to Section 4 of the DC EWMP.

This section highlights key metrics associated with the RAA as follows:

- Overview of modeling approach and modeling domain (4.1)
- Baseline watershed model calibration (4.2)
- Baseline critical conditions and required pollutant reductions (4.3)
- Representation of control measures in RAA (4.4)
- Approach for selecting control measures for the EWMP Implementation Plan (4.5)

4.1 Overview of RAA Modeling Approach

The Watershed Management Modeling System (WMMS) is the modeling system used to conduct the RAA for the Lawndale EWMP. WMMS is specified in the Permit as an approved tool to conduct the RAA. WMMS includes a comprehensive watershed model of the entire Los Angeles County area that represents the unique hydrology and hydraulics features and characterizes pollutant loading and downstream transport for all of the key TMDL constituents.

There are 130 subwatersheds in the Dominguez Channel and Estuary Watershed portion of the WMMS model (Figure 4-1). Figure 4-2 zooms into the 9 subwatersheds and one receiving water/assessment area that intersect the Lawndale jurisdictional boundary.

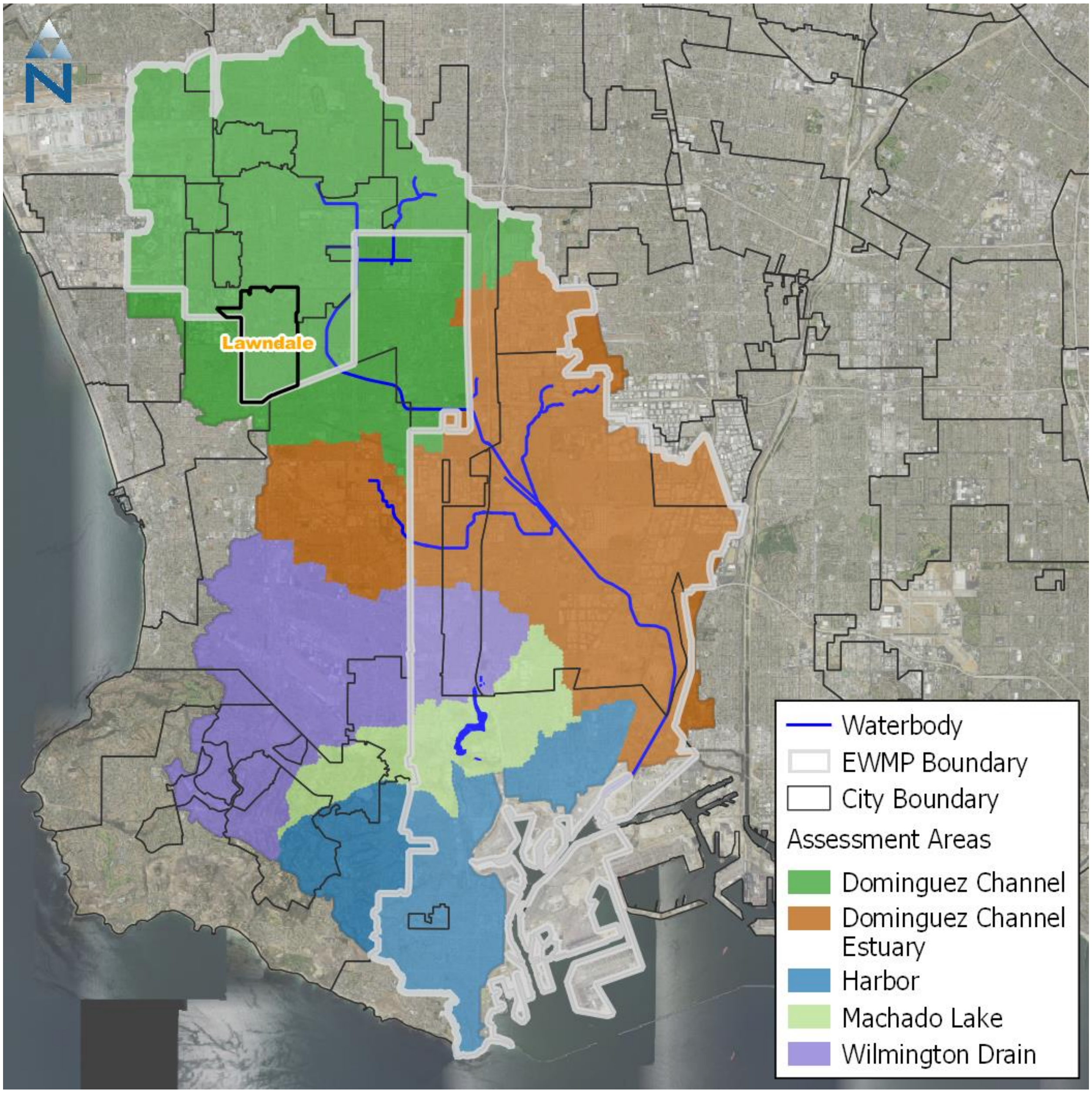


Figure 4-1. Location of Lawndale within the DC EWMP Area and nearby tributary / assessment areas.

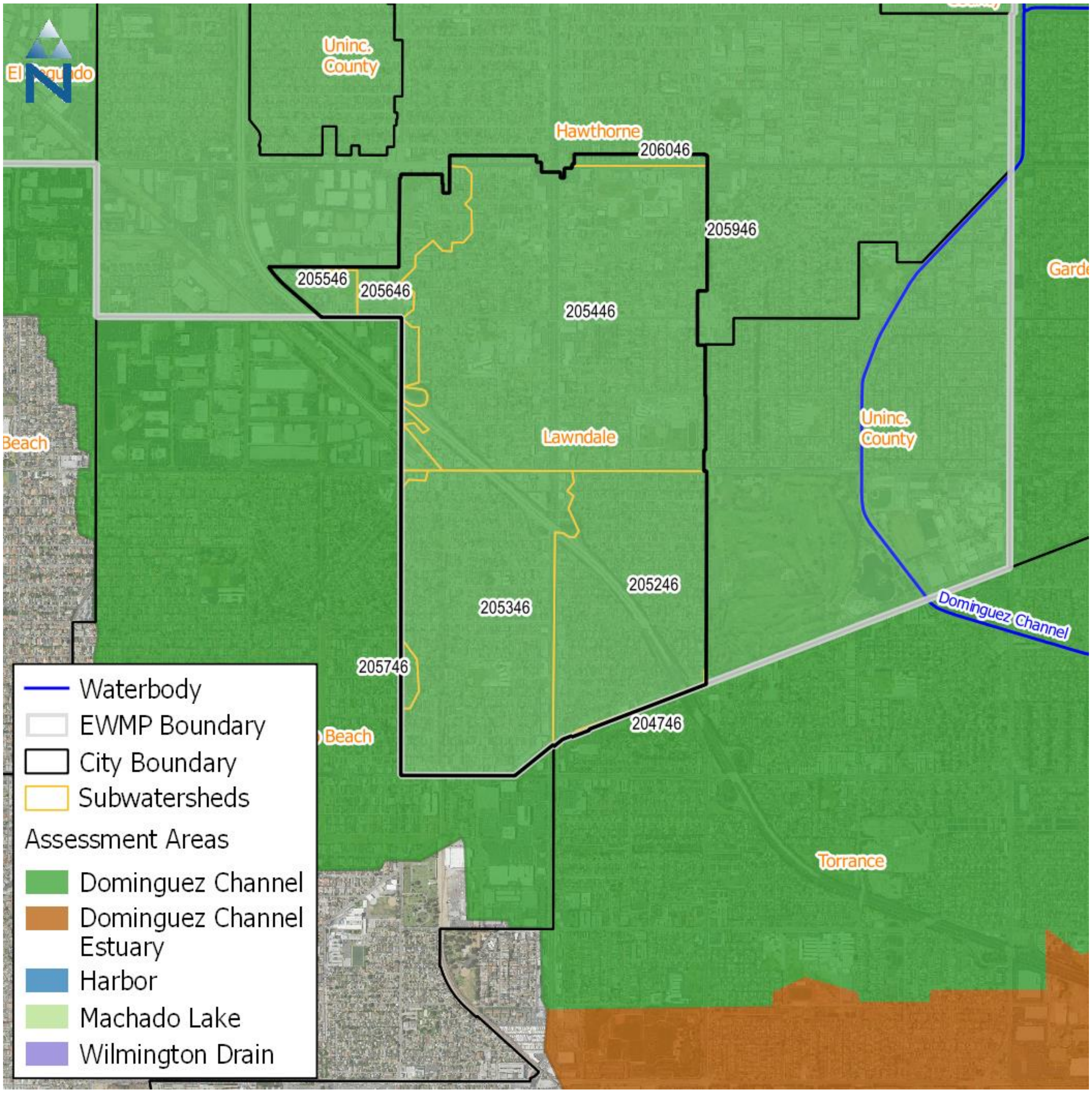


Figure 4-2. Zoomed in view of Lawndale subwatersheds and receiving waters.

4.2 Baseline Watershed Model Calibration

The objective of baseline watershed model calibration is to develop a watershed model that accurately predicts the receiving water hydrology and water quality in the Dominguez Channel watershed. Given that the instream flow gage is the point of reference for model calibration, establishing a baseline model focuses on identifying features and processes that occur between the point where runoff originates and the gage where flow and water quality are measured. The Dominguez Channel portion of the *original* WMMS model was uncalibrated because flow and water quality data were either not available or not accessible when WMMS was originally developed. As such, the WMMS model was updated, as described in Section 4 of the DC EWMP, in order to improve the calibration. The calibration primarily relied upon flow and water quality monitoring data provided by the LACFCD from the S28 mass emission station on Dominguez Channel at Artesia Blvd. S28 is in the freshwater portion of Dominguez Channel, upstream of the tidally-influenced reaches of channel. The area upstream of S28 represents approximately 30% of the total drainage area for Dominguez Channel and Dominguez Channel Estuary, as shown in Table 4-1. The drainage area upstream of S28 is also representative in terms of land use and rainfall distribution, as shown in Table 4-1.

The baseline model used for the DC EWMP was applied directly to the RAA for Lawndale. Calibration performance and comparison to the RAA Guidelines is provided in Section 4 of the DC EWMP.

Table 4-1. Comparison of land use distribution upstream of the S28 gage versus the entire Dominguez Channel and Estuary watershed

Land Use		Land Use Distribution[1] by Drainage Area			
		Dominguez Channel and Estuary Watershed		Dominguez Channel at Artesia Blvd (S28)	
		Acres	Percent	Acres	Percent
Impervious	Residential	10,889	16%	4,176	20%
	Commercial	5,854	8%	2,256	11%
	Institutional	2,670	4%	907	4%
	Industrial	10,412	15%	2,035	10%
	Roads	10,258	15%	3,958	19%
Urban Pervious		26,581	38%	7,493	35%
Non-Urban		3,455	5%	382	2%
Total		**70,119**	**100%**	**21,208**	**100%**

1: Color gradient shows relative land use distribution from least (white) to greatest (red).

4.3 Baseline Critical Conditions and Required Pollutant Reductions

The critical condition for the DC EWMP is the storm that produces the 90th percentile pollutant load. The RAA and EWMP Implementation Strategy are based around achieving required pollutant load reduction to attain the water quality targets during that critical condition. The primary water quality targets in Dominguez Channel (Lawndale's single receiving water) are shown in Table 3-7 of the DC EMWP. The baseline 90th percentile loading for the limiting pollutants for Dominguez Channel – zinc and bacteria – was determined along with the required reductions to achieve the corresponding water quality targets. Shown in Table 4-2 are the calculated required pollutant reductions for interim and final compliance for Dominguez Channel. The simulated required zinc reduction, 86%, is quite high compared to other waterbodies in the region, which ultimately drives the overall capacity of BMPs in Lawndale's EWMP Implementation Strategy.

In accordance with the RAA Guidelines, the interim required reductions are based on the average storm while the final required reductions are based on the 90th percentile storm event. The ratio of average to 90th percentile loading (shown in Table 4-2) is used to phase from interim to final compliance over the course of the EWMP implementation schedule.

It is noted that for bacteria (E. coli), a slightly different approach was used. Rather than rely on load reduction, the RAA is based on retention of the runoff from the 90th percentile "critical bacteria storm". The 90th percentile critical bacteria storm accounts for allowable exceedance days and the High Flow Suspension, using the LA River Bacteria TMDL as a template. The LA River Bacteria TMDL includes 10 allowable exceedance days in addition to High Flow Suspension days. See the draft Upper LA River EWMP (ULAR Group, 2015) for additional details on the RAA methodology used to address bacteria.

Table 4-2. Required Pollutant Reductions for Interim and Final Compliance for Lawndale Assessment Areas

Condition and Pollutant Addressed	Reduction Metric	Dominguez Channel RAA Assessment Area
Final Compliance with Metals and Other Water Quality Priorities (except *E. coli*)	Required Load Reduction [1]	86%
	Allowable load during 90th percentile/final condition (pounds)	87.6
	Loading during 90th percentile/final condition (pounds) [2]	625.7
Interim Compliance with Metals and Other Water Quality Priorities (except *E. coli*)	Loading during average/interim condition (pounds) [3]	182.3
	Ratio used to gradually phase from interim to final reduction (Average:90th Percentile)	0.29
Final Compliance with *E. coli*	Runoff volume to be retained [4]	Runoff from critical bacteria storm is retained prior to discharge to receiving water (excluding open space subwatersheds)

1 – Based on control of zinc during storm that generates the 90th percentile zinc load
2 – Loading of zinc at mouth of watershed from storm that generates the 90th percentile zinc load
3 – Loading of zinc at mouth of watershed from storm that generates the average zinc load
4 – Critical bacteria storm methodology is consistent with the Upper Los Angeles River EWMP (ULAR Group 2015)

4.4 Representation of EWMP Control Measures

The representation of control measures in the model is an important element of the RAA, as it provides the link between future watershed activities, model-predicted water quality improvement and ultimately, compliance. An overview of menu of control measures selected by Lawndale for inclusion in the EWMP and the analysis/screening of potential BMP opportunities in the city limits was presented in Section 3. Additional details on the assumptions used to represent the control measures in the RAA (including assumed design details) are provided in Table 4-3.

The RAA for Lawndale introduces a key analytical element – application of the BMP model SUSTAIN – which was not previously applied in the original DC EWMP. By applying SUSTAIN, the EWMP Implementation Strategy for Lawndale is able to benefit from optimization, which helps to increase the cost efficiency of the BMP network. The design assumptions in Table 4-3 were used within the SUSTAIN model to represent BMPs and their performance.

Table 4-3. Summary of EWMP control measure opportunities included in RAA

BMP Category	Sub-Type	Description of BMP Program	RAA Assumptions regarding BMP Design Parameters
Institutional	MCMs and/or Enhanced MCMs	For 5% reduction: implement new MCMs in 2012 Permit. For additional 5% reduction Lawndale identified additional control measures and schedule for implementation. Examples include enhanced street sweeping and implementation of catch basin inserts.	None, not modeled explicitly.
LID	LID Ordinance (New/ Redevelopment)	BMP implementation assumed to equal redevelopment growth rates reported by Los Angeles Bureau of Sanitation (see Table 4.5 of the DC EWMP). Lawndale will track redevelopment and verify that that LID is implemented at projected rate, based on capacities and schedules in Section 5.	Bioretention/Biofiltration sized to capture 85th percentile runoff from parcel. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.
	Existing and Planned BMPs	Planned LID BMPs will be implemented as planned, according to projects constructed after 2011 that were listed in Section 3.2	Bioretention/Biofiltration sized to capture 85th percentile runoff from parcel. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.
Green Streets	Green Streets	Lawndale will implement green street projects according to the specified capacities and schedule in Section 5.	Bioretention/biofiltration is 4-ft wide. Permeable pavement/subsurface storage is 5-ft wide and used in tandem with bioretention/biofiltration. 50% of street length retrofittable. Underdrains modeled if subsoil infiltration rate less than 0.3 in/hr.

BMP Category	Sub-Type	Description of BMP Program	RAA Assumptions regarding BMP Design Parameters
Regional BMPs	Alondra Park	Lawndale will implement regional projects (other regional projects on public land) according to the specified capacities in Section 5. Pending more detailed site evaluation in the future, these regional BMPs were assumed to be a 3-ft-deep infiltration basin.	BMP footprint delineated and depth specified based on site configuration, topography, depth to groundwater, and other infrastructure. Pump specified if greater than 100 ft from major storm drain. See Section 3.1 for drainage area details.

4.5 Selection of Control Measures for Pollutant Reduction Plan

The RAA process is an important tool for assisting EWMP agencies with selection of control measures for the EWMP Implementation Plan. A major challenge associated with stormwater planning is the multitude of potential types and locations of control measures and the varying performance and cost of each scenario. The SUSTAIN model within WMMS provides a powerful tool for considering millions of scenarios of control measures and recommending a solution based on cost-effectiveness.

4.5.1 Selection of Control Measures for Final Wet Weather Compliance

The RAA process for Lawndale first determined the control measures to achieve zinc RWLs under critical conditions and then determined the additional capacity (if any) to retain the critical bacteria storm. The optimization modeling is conducted stepwise to determine the control measures for final compliance that are selected for the EWMP Implementation Plan, as follows:

1. Determine the cost-effective BMP solutions for each subwatershed in the EWMP area: an example set of "BMP solutions" is shown in Figure 4-3, which shows thousands of scenarios considered for an individual subwatershed in the EWMP area. The scenarios are based on the available opportunity (e.g., the available footprints for regional BMPs and length of right-of-way for green streets) and predicted performance for controlling zinc if BMPs were implemented at those opportunities with varying sizes. The most cost-effective BMP solutions for each of the 9 subwatersheds in Lawndale provide the basis for cost optimization.

2. By rolling up the most cost-effective BMP solutions at the subwatershed level, the most cost-effective EWMP Implementation Plan can be estimated. The cumulative "cost- optimization curves" for the subwatersheds becomes the overall cost optimization curves for Lawndale, as presented in Figure 4-4. Note that the three regional BMPs dominate the cost-optimization curve for Lawndale, as they are relatively large and are able to retain much of the runoff from Lawndale.

3. Extract the cost-effective scenarios for the required zinc reduction: the required zinc reduction specified in Table 4-2 (86%) determines the specific combination of LID, green streets and regional BMPs that is selected from the cost optimization curves. The Lawndale assessment area was held to the same percent reduction as other jurisdictions contributing to the same waterbodies. The selected scenarios become the EWMP Implementation Plan, and comprise a detailed "recipe for compliance" for Lawndale.

4. After the control measures for zinc are determined, the critical bacteria storm is routed through them: the effectiveness of the selected control measures for retaining the critical bacteria storm is evaluated. The additional capacity (if any) to retain the critical bacteria storm is determined for each subwatershed.

Figure 4-5 illustrates the process described above for using optimization to determine the combination of LID, green streets and regional BMPs that make up the EWMP Implementation Plan.

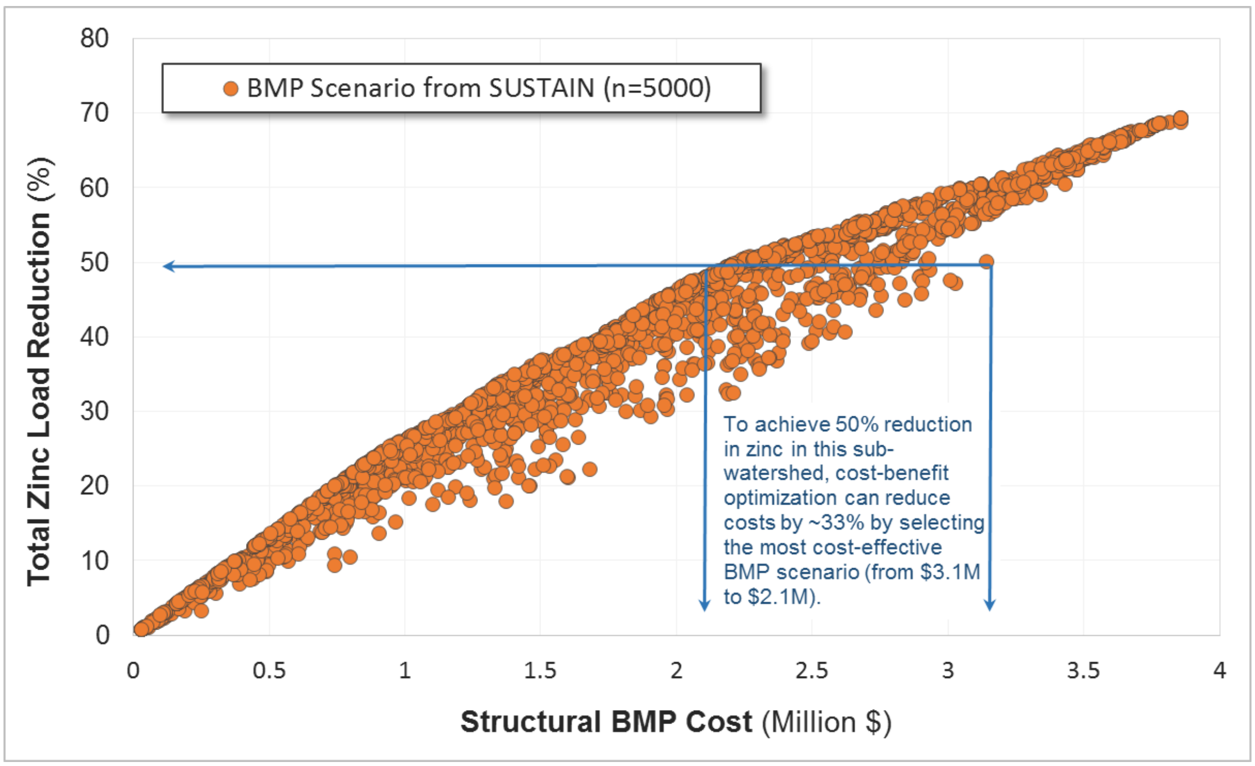


Figure 4-3. Example BMP solutions for a selected subwatershed and advantage of cost-benefit optimization.

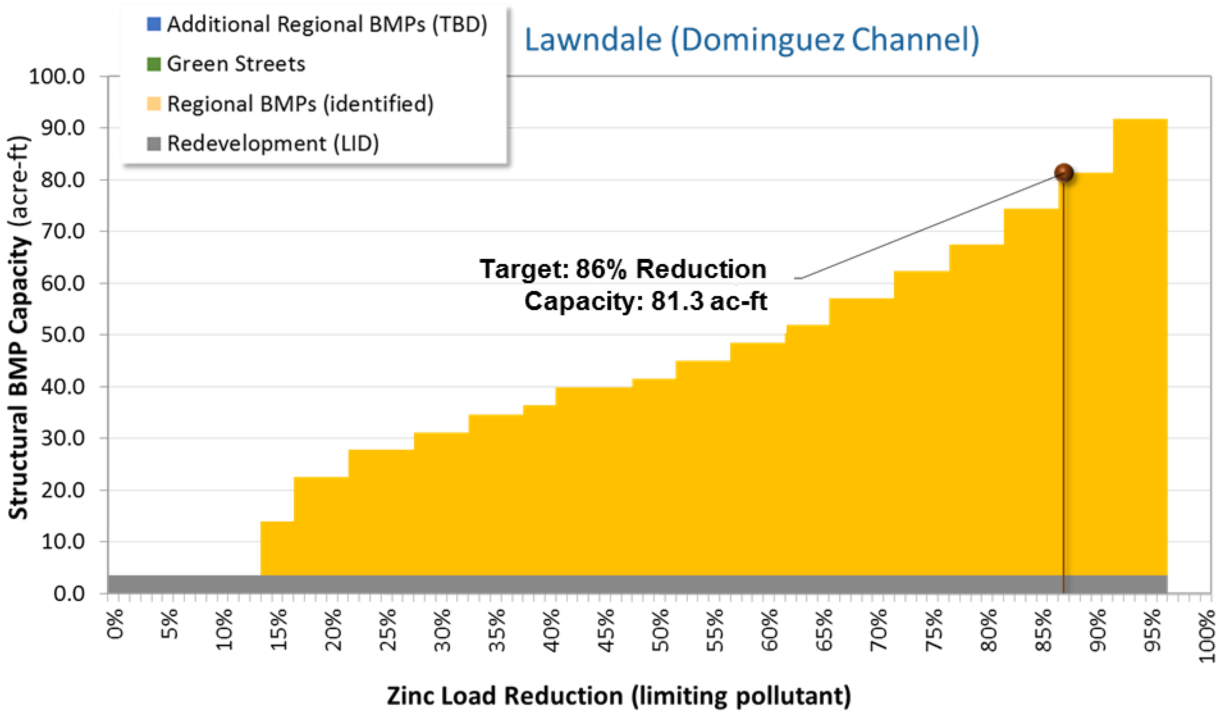
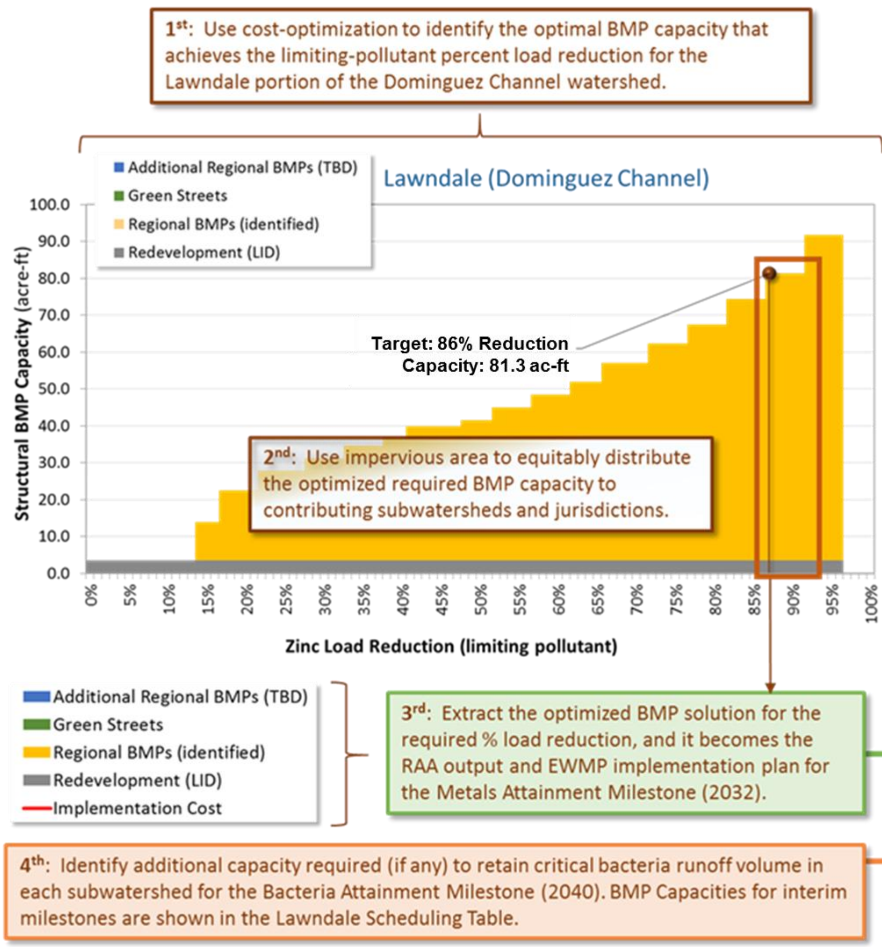


Figure 4-4. Cost Optimization curves for Lawndale in Dominguez Channel watershed.

This graph shows the optimized BMP solutions for the City of Lawndale. The optimization curve represents thousands of BMP scenarios that were evaluated for cost-effectiveness.



Lawndale Scheduling Table

	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
			LID	Streets	Regional BMPs		
Assessment Area	EWMP Milestone	24-hour Volume Managed (acre-ft)	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	22.5	0.3	—	16.9	—	**17.2**
	75% Milestone (2029)	33.6	0.3	—	27.6	—	**28.0**
	Final Metals (2032)	42.2	3.5	—	34.8	—	**38.3**
	Final Bacteria (2040)	42.2	3.5	—	34.8	—	**38.3**
Total	—	**42.2**	**3.5**	—	**34.8**	—	**38.3**

Detailed Recipe (by 2040)

	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)								
	For Toxics by 2032	For Bacteria by 2040	Harbor Toxics TMDL and other WQPs by 2032							For Bacteria Attainment by 2040	
				LID	Streets	Regional BMPs					
Subwatershed ID	24-hour Volume Managed (acre-ft)	Additional 24-hour Volume Managed (acre-ft)	% Load Reduction Critical Condition	Redevelopment	Green Streets	Regional BMPs (identified)	Additional Regional BMPs (TBD)	Total BMP Capacity (acre-ft)	Regional BMPs (additional)	Cumulative BMP Capacity for Final Compliance (acre-ft)
204746	0.12	--	90%	--	--	0.10	--	**0.01**	--	**0.01**
205246	7.15	--	90%	3.49	--	5.89	--	**3.99**	--	**3.99**
205346	10.09	--	90%	--	--	8.31	--	**6.57**	--	**6.57**
205446	20.51	--	90%	--	--	16.90	--	**24.93**	--	**24.93**
205546	1.37	--	90%	--	--	1.13	--	**0.07**	--	**0.07**
205646	2.71	--	90%	--	--	2.23	--	**0.98**	--	**0.98**
205746	0.26	--	90%	--	--	0.22	--	**0.07**	--	**0.07**
205946	0.00	--	90%	--	--	--	--	**0.00**	--	**0.00**
206046	0.00	--	90%	--	--	--	--	**0.05**	--	**0.05**
Total	**42.21**	--	**90.1%**	**3.49**	--	**34.76**	--	**36.68**	--	**36.68**

RED = Subwatersheds with highest required % load reductions
BLUE = Subwatersheds with highest BMP capacities within a BMP category

Figure 4-5. Illustration of how the EWMP Implementation Plan is extracted from a cost optimization curve.

This illustration is of Lawndale's area in the Dominguez Channel watershed. Four steps are shown for RAA development: developing cost-optimized BMP solutions for a wide range of % load reductions (1st, uppermost text box), determining the equitable % load reduction needed to attain RWLs for the corresponding receiving water (2nd, middle text box), extracting the BMP solution for metals attainment (3rd, bottom text box), and identifying additional capacity for bacteria attainment (4th, bottom text box). Other details of the EWMP Implementation Plan are presented in Section 5. Note that while each assessment area/watershed achieves the required 86% reduction in aggregate, subwatersheds *within* the jurisdiction have variable reductions based on optimization (which is why some subwatersheds have high % reductions [red shaded rows in table] and others have low % reductions).

4.5.2 Scheduling of Control Measures for Interim Wet Weather Compliance

With the EWMP Implementation Plan for final compliance determined, the remaining step for the wet weather RAA is scheduling of control measures *over time* to achieve interim milestones. Following an identical approach as the DC EWMP, the following wet weather milestones were utilized for development of the Lawndale EWMP Implementation Plan, primarily based on achieving the final limits of the DC Toxics TMDL by 2032 and addressing bacteria by 2040:

- Achieve 50% of the reduction for zinc[3] (2026)
- Achieve 75% of the reduction for zinc (2029)
- Final compliance with zinc RWLs (2032)
- Final compliance with bacteria WQBELs (2040)

5 EWMP IMPLEMENTATION PLAN

The EWMP Implementation Plan is the "recipe for compliance" for Lawndale to address Water Quality Priorities and comply with the provisions of the MS4 Permit. Through the RAA, a series of quantitative analyses were used to identify the capacities of LID, green streets and regional BMPs that comprise the EWMP Implementation Plan. The RAA also assures those control measures will address the Water Quality Priorities within the specified compliance schedules. The EWMP Implementation Plan includes a recipe for the Dominguez Channel, Lawndale's single receiving water (see Figure 4-2 for a map of these assessment areas). Implementation of the EWMP Implementation Plan will provide a BMP-based compliance pathway for Lawndale to achieve the MS4 Permit. This section describes the EWMP Implementation Plan for Lawndale and the pace of its implementation to achieve applicable milestones, through the following subsections:

- Elements of the EWMP Implementation Plan (5.1)
- Stormwater control measures to be implemented by 2040 for final compliance (5.2)
- Scheduling of stormwater control measures to achieve TMDL and EWMP milestones (5.3)

5.1 Elements of the EWMP Implementation Plan

The EWMP Implementation Plan for Lawndale is expressed in terms of [1] the volumes[4] of stormwater and non-stormwater to be managed by Lawndale to address Water Quality Priorities and [2] the control measures that will be implemented to achieve those volume reductions. The two primary elements of the EWMP Implementation Plan are as follows

- **Compliance Targets:** for MS4 compliance determination purposes, the ultimate metric for EWMP implementation is the volume of stormwater managed by implemented control measures. The stormwater volume to be managed[5] by Lawndale is considered a measurable

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[3] While these milestones are expressed as reduction in zinc, because zinc is a limiting pollutant, achievement of zinc RWLs assures even greater reduction in other Water Quality Priority pollutants.

[4] Volume is used rather than pollutant loading because volume reduction is more readily tracked and reported by MS4 agencies. The volume reductions are actually a *water quality* improvement metric based on required pollutant reductions.

[5] The volume is determined by reporting the amount of water that would be retained (infiltrated) by BMPs

goal that will be used to assess BMP-based compliance. To support future compliance determination and adaptive management, the volume of stormwater is reported along with the capacities of control measures to be implemented by Lawndale in the EWMP Implementation Plan.

- **EWMP Implementation Plan:** the network of control measures that has reasonable assurance of achieving the Compliance Targets is referred to as the EWMP Implementation Plan. The identified BMPs (and BMP preferences) will likely evolve over the course of adaptive management in response to "lessons learned". As such, it is anticipated the BMP capacities within the various subcategories will be reported to the Regional Board but not tracked explicitly by the Regional Board for compliance determination. As BMPs are substituted over the course of EWMP implementation (e.g., replace green street capacity in a subwatershed with additional regional BMP capacity), the Group will show equivalency for achieving the corresponding Compliance Target.

5.2 Stormwater Control Measures to be Implemented by 2040 for Final Compliance

The EWMP will guide stormwater management in Lawndale for the coming decades, and the control measures to be implemented have the potential to transform communities including widespread green infrastructure. The EWMP Implementation Plan identifies the location and type of control measures to be implemented by Lawndale for final compliance by 2040, which includes addressing all Water Quality Priorities including the limiting pollutants total zinc and *E. coli*. The EWMP Implementation Plan for final compliance is presented as the following components:

- **Summary of total capacity of control measures to be implemented by Lawndale across the entire EWMP area:** bar graphs are used to summarize the control measure capacities that comprise the EWMP Implementation Plan. Shown in Figure 5-1 are the bar graphs that detail the various sub-categories of control measures to be implemented by Lawndale across its jurisdiction, along with a comparison to other jurisdictions in the DC WMG. Figure 5-2 shows the relative capacity by different BMP types.
- **Detailed recipe for compliance including volumes of stormwater to be managed by Lawndale and control measure capacities:** the EWMP Implementation Plan is detailed for each subwatershed in the EWMP area (generally 1 to 2 square mile drainages). Shown in Figure 5-3 is a map of the "density" of control measure capacities to be implemented to address zinc and other Water Quality Priorities (through controlling zinc). Because the required reductions for zinc are so high, no additional control measures beyond those presented in Figure 5-3 are required to address *E. coli*. This map is shown in a tabular form in Table 5-1 (by subwatershed), and the scheduling of control measures (by milestone) is shown in Table 5-2. These tables show both the volumes of stormwater to be managed in each subwatershed

over the course of a 24-hour period under the critical 90th percentile storm condition. Additional volume would be *treated* by these BMPs, but that additional treatment is *implicit* to the reported Compliance Targets.

While the EWMP Implementation Plan reports the *total* BMP capacity to be implemented, that capacity is not a compliance target because some BMP capacities are sized to reflect a BMP program rather than sized to achieve the required reduction. For example, the BMPs implemented by the LID ordinance and the residential LID program were sized to retain the 85th percentile, 24-hour storm but that volume may be larger than is needed to achieve zinc RWLs. If those BMPs were replaced by a different type of BMP (e.g., regional BMP), the total BMP capacity may be smaller but just as effective.

(Compliance Targets) and the control measures to achieve those volume reductions (EWMP Implementation Plan). Separate Compliance Targets and EWMP Implementation Plans are provided for Metals and Other Water Quality Priorities and *E. coli*.

In addition to the scheduled stormwater capture milesones detailed in Table 5-2, by December 2017, the City will also advance the planning for the Alondra Park regional project, as follows:

- Coordination with other jurisdictions in the wet weather capture area to evaluate feasibility of cost-sharing for project construction and maintenance;
- Pursuit of funding to construct the facility to manage the wet weather capture area, either through grants, loans, or stormwater fees;
- Determination through partnering with other jurisdictions if an alternate design is feasible to manage additional stormwater volume to offset costs of the other regional projects below. As the project will capture stormwater from the majority of the City drainage area, an alternative design that provides more capture could lessen the need for other BMPs. This evaluation will consider site constraints of the parking lot at Alondra Park, construction costs, and long-term site disturbance that would be necessary.

If, over the course of further planning the regional project, it is determined the project is not feasible or desirable, then equivalent projects will be identified in terms of stormwater managed.

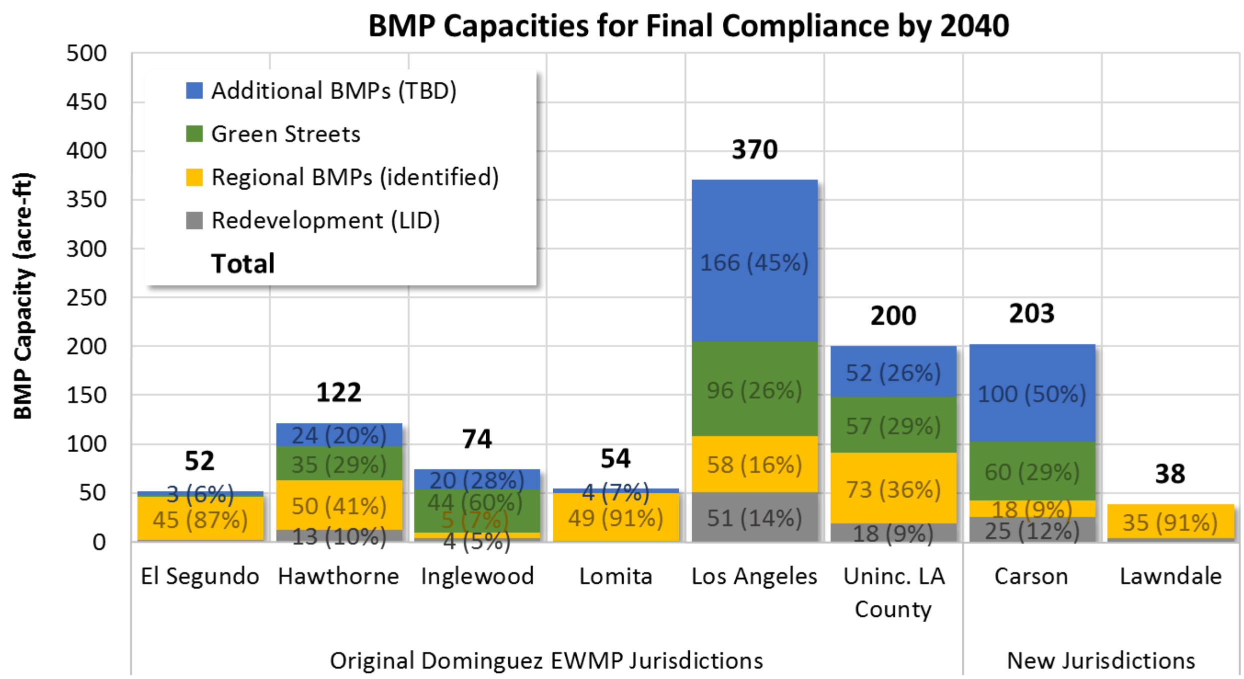

Figure 5-1. DC EWMP Implementation Plan for Final Compliance by 2040 including Lawndale.

This graph shows the total structural BMP capacity required for each DC EWMP jurisdiction including Lawndale to attain RWLs. It also shows BMP types (LID, green streets and regional BMPs). For Carson (among the new jurisdictions), additional Regional BMPs (to be determined) were shown to be needed when the screened opportunity for optimization modeling was found to be insufficient to achieve compliance targets. In contrast, Lawndale BMP opportunity was found to be sufficient to avoid the need for Additional Regional BMPs.

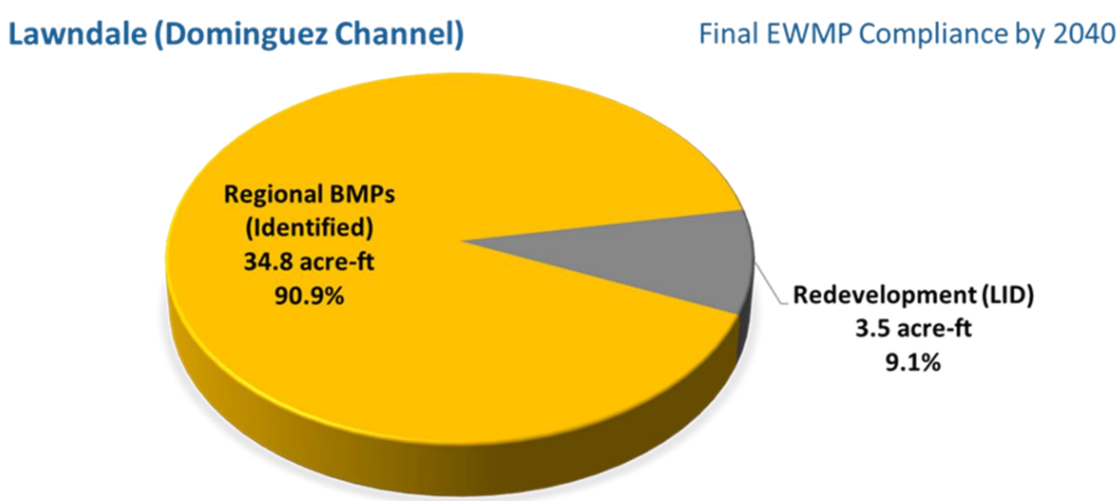

Figure 5-2. BMP distribution in Lawndale's EWMP Implementation Plan.

This figure shows relative capacity distribution for different types of control measures for the final 2040 EWMP milestone.

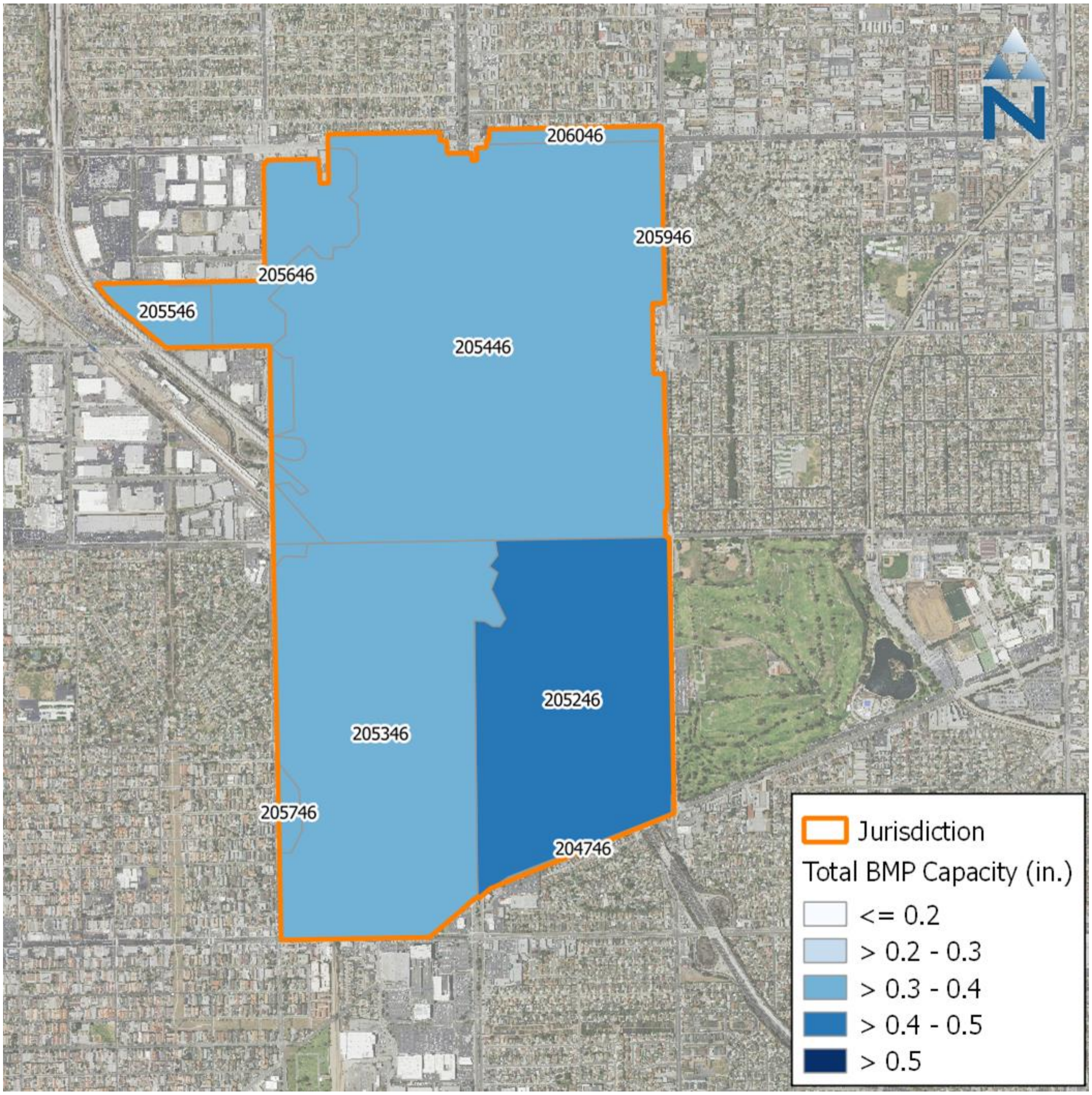

Figure 5-3. Lawndale EWMP Implementation Plan by subwatershed for metals and other water quality priorities (except *E. coli*).

This map presents Lawndale's EWMP Implementation Plan for Metals and Other Water Quality Priorities as control measure "density" by subwatershed. The BMP density is higher in some areas [dark blue] because those are the subwatersheds where most of the BMP capacity will be implemented. The BMP capacities are normalized by area (i.e., the BMP capacity for each subwatershed [in units of acre-feet] was divided by the subwatershed area [in units of acres] to express the BMP capacity in units of depth [inches]). This map presents the total BMP capacity for metals attainment summarized in Table 5-1 (by subwatershed) and Table 5-2 (by milestone). Note that while each jurisdiction that drains to Dominguez Channel is held to an equivalent % reduction (86%), subwatersheds within an assessment area may have variable reductions based on optimization or due to increase BMP opportunity in those areas (in this case, potential sites for regional BMPs).

Table 5-1. Lawndale, Dominguez Channel: RAA Output and EWMP Implementation Plan for Final Compliance by 2040

Subwatershed ID	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)							
	For Toxics by 2032	For Bacteria by 2040	Harbor Toxics TMDL and other WQPs by 2032						For Bacteria Attainment by 2040	
				LID	Streets	Regional BMPs				
	24-hour Volume Managed (acre-ft)	Additional 24-hour Volume Managed (acre-ft)	% Load Reduction Critical Condition	Redevelopment	Green Streets	Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)	Regional BMPs (additional)	Cumulative BMP Capacity for Final Compliance (acre-ft)
204746	0.12	---	90%	---	---	0.10	---	**0.01**	---	**0.01**
205246	7.15	---	90%	3.49	---	5.89	---	**3.99**	---	**3.99**
205346	10.09	---	90%	---	---	8.31	---	**6.57**	---	**6.57**
205446	20.51	---	90%	---	---	16.90	---	**24.93**	---	**24.93**
205546	1.37	---	90%	---	---	1.13	---	**0.07**	---	**0.07**
205646	2.71	---	90%	---	---	2.23	---	**0.98**	---	**0.98**
205746	0.26	---	90%	---	---	0.22	---	**0.07**	---	**0.07**
205946	0.00	---	90%	---	---	---	---	**0.00**	---	**0.00**
206046	0.00	---	90%	---	---	---	---	**0.05**	---	**0.05**
Total	**42.21**	**---**	**90%**	**3.49**	**---**	**34.76**	**---**	**36.68**	**---**	**36.68**

Table 5-2. Lawndale: RAA Output and EWMP for Interim Milestones and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID	Streets	Regional	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
			Redevelopment	Green Streets	Regional BMPs (identified)		
Dominguez Channel	50% Milestone (2026)	22.5	0.3	---	16.9	---	**17.2**
	75% Milestone (2029)	33.6	0.3	---	27.6	---	**28.0**
	Final Metals (2032)	42.2	3.5	---	34.8	---	**38.3**
	Final Bacteria (2040)	42.2	3.5	---	34.8	---	**38.3**
Total	**---**	**42.2**	**3.5**	**0.0**	**34.8**	**0.0**	**38.3**

6 ADAPTIVE MANAGEMENT FRAMEWORK

Refer to Section 6 of the DC EWMP for details regarding adaptive management. In general, over time the monitoring data will be used to refine the estimated pollutant reductions and selected BMPs for implementation will evolve. As BMPs are "substituted", Lawndale will demonstrate equivalent performance for achieving the volume-based Compliance Targets.

7 IMPLEMENTATION COSTS & FINANCIAL STRATEGY

The estimated EWMP costs and financial strategy for the City of Lawndale are fully integrated within Section 7 of the DC EWMP as part of the WMG.

8 REFERENCES

ULAR Group (Upper Los Angeles River EWMP Group). 2015. *DRAFT Enhanced Watershed Management Program.* Prepared by the Upper Los Angeles River EWMP Group. Submitted June 2015.

Appendix AB:

BMP Capacities by Milestone

Tables

Table 1. Carson: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID Redevelop-ment	Streets Green Streets	Regional Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
LA River Watershed	31% Milestone (2017)	1.4	0.2	0.3	---	0.8	**1.3**
	50% Milestone (2024)	2.5	0.3	0.3	---	1.7	**2.2**
	Final Metals (2028)	4.9	0.4	0.3	---	3.7	**4.4**
	Final Bacteria (2037)	4.9	0.4	0.3	---	3.7	**4.4**
Dominguez Estuary	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1]. Also see regional BMP milestones in Section 5.2 of this addenda (p. 25)					
	50% Milestone (2026)	73.0	9.3	40.6	9.2	---	**59.2**
	75% Milestone (2029)	159.8	17.7	59.5	9.2	45.1	**131.5**
	Final Metals (2032)	224.4	22.7	59.5	9.2	94.9	**186.3**
	Final Bacteria (2040)	225.6	22.7	59.5	9.2	96.1	**187.5**
Machado Lake	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1]. Also see regional BMP milestones in Section 5.2 of this addenda (p. 25)					
	Final Bacteria (2040)	0.6	0.7	---	---	0.3	**1.0**
Wilmington Drain	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1]. Also see regional BMP milestones in Section 5.2 of this addenda (p. 25)					
	Final Bacteria (2040)	0.6	1.1	---	8.5	0.2	**9.7**
Total	**---**	**231.7**	**24.9**	**59.5**	**17.7**	**100.3**	**202.6**

1 – In response to comments from the Regional Board on the DC EWMP, the EWMP is incorporating planning milestones for structural control measures. Those milestones will be into the revised DC EWMP, to be submitted to the Regional Board in early 2016.

Table 2. El Segundo: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
			LID	Streets	Regional		
	EWMP Milestone	24-hour Volume Managed (acre-ft)	Redevelopment	Green Streets	Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	55.6	0.3	---	44.9	---	**45.1**
	75% Milestone (2029)	55.8	0.4	---	44.9	---	**45.2**
	Final Metals (2032)	63.6	1.4	2.0	44.9	3.3	**51.5**
	Final Bacteria (2040)	63.6	1.4	2.0	44.9	3.3	**51.5**
Total	**---**	**63.6**	**1.4**	**2.0**	**44.9**	**3.3**	**51.5**

Table 3. Hawthorne: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
			LID	Streets	Regional		
	EWMP Milestone	24-hour Volume Managed (acre-ft)	Redevelopment	Green Streets	Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	66.3	2.2	---	41.9	---	**44.0**
	75% Milestone (2029)	94.5	4.7	14.4	50.1	---	**69.2**
	Final Metals (2032)	151.6	12.5	35.3	50.1	23.7	**121.5**
	Final Bacteria (2040)	151.6	12.5	35.3	50.1	23.7	**121.6**
Total	**---**	**151.6**	**12.5**	**35.3**	**50.1**	**23.7**	**121.6**

Table 4. Inglewood: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID: Redevelopment	Streets: Green Streets	Regional: Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	33.9	1.2	11.3	5.2	---	**17.7**
	75% Milestone (2029)	54.5	1.9	29.1	5.2	---	**36.3**
	Final Metals (2032)	96.5	4.1	44.1	5.2	20.3	**73.7**
	Final Bacteria (2040)	96.5	4.1	44.1	5.2	20.4	**73.8**
Total	**---**	**96.5**	**4.1**	**44.1**	**5.2**	**20.4**	**73.8**

Table 5. Lawndale: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID: Redevelopment	Streets: Green Streets	Regional: Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	22.5	0.3	---	16.9	---	**17.2**
	75% Milestone (2029)	33.6	0.3	---	27.6	---	**28.0**
	Final Metals (2032)	42.2	3.5	---	34.8	---	**38.3**
	Final Bacteria (2040)	42.2	3.5	---	34.8	---	**38.3**
Total	**---**	**42.2**	**3.5**	**0.0**	**34.8**	**0.0**	**38.3**

Table 6. Lomita: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID	Streets	Regional	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
			Redevelopment	Green Streets	Regional BMPs (identified)		
Machado Lake	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	Final Bacteria (2040)	3.3	0.6	---	1.5	2.8	**4.8**
Wilmington Drain	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	Final Bacteria (2040)	34.9	0.7	---	47.5	1.0	**49.2**
Total	**---**	**38.2**	**1.3**	**0.0**	**49.0**	**3.8**	**54.1**

1 – In response to comments from the Regional Board on the DC EWMP, the EWMP is incorporating planning milestones for structural control measures. Those milestones will be into the revised DC EWMP, to be submitted to the Regional Board in early 2016.

Table 7. Los Angeles: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
	EWMP Milestone	24-hour Volume Managed (acre-ft)	LID Redevelopment	Streets Green Streets	Regional Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	24.8	9.2	7.3	1.3	---	**17.7**
	75% Milestone (2029)	38.0	12.1	16.8	1.3	---	**30.1**
	Final Metals (2032)	82.9	23.5	19.2	1.3	26.8	**70.7**
	Final Bacteria (2040)	82.9	23.5	19.2	1.3	26.9	**70.8**
Dominguez Estuary	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	50% Milestone (2026)	25.5	6.2	10.5	---	---	**16.7**
	75% Milestone (2029)	42.2	8.7	23.7	---	---	**32.4**
	Final Metals (2032)	93.6	16.1	26.7	---	35.0	**77.7**
	Final Bacteria (2040)	93.6	16.1	26.7	---	35.4	**78.1**
Harbor	50% Milestone (2026)	68.4	2.4	14.0	34.3	---	**50.7**
	75% Milestone (2029)	107.0	4.3	44.7	34.3	---	**83.3**
	Final Metals (2032)	233.8	7.7	50.2	34.3	94.3	**186.5**
	Final Bacteria (2040)	233.8	7.7	50.2	34.3	98.0	**190.2**
Machado Lake	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	Final Bacteria (2040)	6.4	2.8	---	---	4.5	**7.3**
Wilmington Drain	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	Final Bacteria (2040)	16.3	0.6	---	22.3	0.8	**23.7**
Total	**---**	**433.1**	**50.7**	**96.0**	**57.8**	**165.6**	**370.2**

1 – In response to comments from the Regional Board on the DC EWMP, the EWMP is incorporating planning milestones for structural control measures. Those milestones will be into the revised DC EWMP, to be submitted to the Regional Board in early 2016.

Table 8. Uninc. LA County: RAA Output and EWMP for Interim and Final Compliance

Assessment Area	COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)				
			LID	Streets	Regional		
	EWMP Milestone	24-hour Volume Managed (acre-ft)	Redevelopment	Green Streets	Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)
Dominguez Channel	50% Milestone (2026)	51.6	1.3	---	63.4	---	**64.7**
	75% Milestone (2029)	68.3	2.6	13.8	63.4	---	**79.8**
	Final Metals (2032)	103.0	6.6	30.4	63.4	11.8	**112.2**
	Final Bacteria (2040)	103.0	6.6	30.4	63.4	11.9	**112.3**
Dominguez Estuary	50% Milestone (2026)	27.8	3.7	10.1	---	---	**13.7**
	75% Milestone (2029)	44.0	5.7	23.1	---	---	**28.8**
	Final Metals (2032)	94.7	9.8	25.2	---	37.4	**72.4**
	Final Bacteria (2040)	94.7	9.8	25.2	---	37.8	**72.8**
Harbor	50% Milestone (2026)	1.6	0.0	0.8	---	---	**0.9**
	75% Milestone (2029)	2.0	0.0	1.3	---	---	**1.3**
	Final Metals (2032)	3.7	0.1	1.7	---	1.0	**2.8**
	Final Bacteria (2040)	3.7	0.1	1.7	---	1.0	**2.8**
Machado Lake	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	Final Bacteria (2040)	0.0	0.0	---	---	0.0	**0.0**
Wilmington Drain	Planning Milestones	See Section 5.2 of the DC EWMP for details of planning milestones[1].					
	Final Bacteria (2040)	10.9	1.9	---	9.5	0.9	**12.3**
Total	**---**	**212.4**	**18.4**	**57.2**	**72.9**	**51.6**	**200.1**

1 – In response to comments from the Regional Board on the DC EWMP, the EWMP is incorporating planning milestones for structural control measures. Those milestones will be into the revised DC EWMP, to be submitted to the Regional Board in early 2016.