APPENDIX A

CITY OF LOS ANGELES LOW IMPACT DEVELOPMENT ORDINANCE

Intentionally Left Blank

ORDINANCE NO. 181899

An ordinance amending Sections 64.70.01 and 64.72 of Article 4.4 of Chapter VI of the Los Angeles Municipal Code to expand the applicability of the existing Standard Urban Stormwater Mitigation Plan (SUSMP) requirements by imposing rainwater Low Impact Development (LID) strategies on projects that require building permits; and amending Section 64.72.05 of Article 1 of Chapter IX of the Los Angeles Municipal Code to collect fees to recover Bureau of Sanitation costs of administering the provisions of this Ordinance.

WHEREAS, the City of Los Angeles is authorized by Article XI, §5 and §7 of the State Constitution to exercise the police power of the State by adopting regulations to promote public health, public safety and general prosperity;

WHEREAS, the City of Los Angeles has authority under the California Water Code to adopt and enforce ordinances imposing conditions, restrictions and limitations with respect to any activity that might degrade the quality of waters of the State;

WHEREAS, the City of Los Angeles has applied an integrated approach to incorporate wastewater, stormwater and runoff, and recycled water management into a single strategy through its Integrated Resources Plan;

WHEREAS, the City of Los Angeles is committed to a stormwater management program that protects water quality and water supply by employing watershed-based approaches that balance environmental and economic considerations;

WHEREAS, the purpose of this Ordinance includes, but is not limited to, rainwater harvesting and stormwater runoff management, water conservation, and recycled water reuse and gray water use, which are all key elements of the City of Los Angeles "Water Supply Action Plan" and are essential to ensuring responsible and sustainable development;

WHEREAS, urbanization has led to increased impervious surface areas resulting in increased water runoff and less percolation to groundwater aquifers causing the transport of pollutants to downstream receiving waters;

WHEREAS, the City of Los Angeles needs to take a new approach to managing rainwater and urban runoff while mitigating the negative impacts of development and urbanization;

WHEREAS, the City of Los Angeles' Los Angeles River Revitalization Plan has identified reduction in peak stormwater runoff in the Los Angeles River as necessary to implement many of the Los Angeles River revitalization projects;

WHEREAS, LID is widely recognized as a sensible approach to managing the quantity and quality of stormwater runoff by setting standards and practices to maintain or restore the natural hydrologic character of a development site, reduce off-site runoff, improve water quality, and provide groundwater recharge; and

WHEREAS, it is the intent of the City of Los Angeles to expand the applicability of the existing Standard Urban Stormwater Mitigation Plan requirements by providing stormwater and rainwater LID strategies for all projects that require building permits.

NOW THEREFORE,

THE PEOPLE OF THE CITY OF LOS ANGELES DO ORDAIN AS FOLLOWS:

Section 1. Section 64.70.01 of Article 4.4 of Chapter VI of the Los Angeles Municipal Code is amended in its entirety to read as follows:

SEC. 64.70.01. DEFINITIONS AND ABBREVIATIONS.

A. Definitions. For the purpose of this Article, the following words and phrases are defined and shall be construed as set out here, unless it is apparent from the context that they have a different meaning:

1. "**Basin Plan**" means a Water Quality Control Plan adopted by the California Regional Water Quality Control Board for a specific watershed or designated area.

2. "**Best Management Practice (BMP)**" means activities, practices, facilities, and/or procedures that when implemented will reduce or prevent pollutants in discharges.

3. "**Board**" means the Board of Public Works of the City of Los Angeles or its duly authorized representative.

4. "**Bureau**" means the Bureau of Sanitation of the City of Los Angeles or its duly authorized representative.

5. "**City**" means the City of Los Angeles or its duly authorized representatives.

6. "**Clean Water Act (CWA)**" means the Federal Water Pollution Control Act enacted in 1972, by Public Law 92-500, and amended by the Water Quality Act of 1987. The Clean Water Act prohibits the discharge of pollutants to Waters of the United States unless the discharge is in accordance with an NPDES permit.

7. "**Commercial Activity**" means any public or private activity involved in the storage, transportation, distribution, exchange or sale of goods and/or commodities or providing professional and/or non-professional services.

8. "**Construction Activity**" means clearing, grading, or excavating that results in soil disturbance. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or the original purpose of the facility, nor does it include emergency construction activities required to immediately protect public health and/or safety.

9. "**Control**" means to minimize, reduce or eliminate by technological, legal, contractual or other means, the discharge of pollutants from an activity or activities.

10. **"Development"** means the construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail and any other non-residential projects, including public agency projects; or mass grading for future construction.

11. **"Development Best Management Practices Handbook"** means such handbook, as may be amended from time to time, adopted by the Board of Public Works.

12. "**Director**" means the Director of the Bureau of Sanitation of the Department of Public Works of the City of Los Angeles or the duly authorized representatives designated to administer, implement and enforce the provisions of this Article.

13. "**Discharge**" means any release, spill, leak, pump, flow, escape, dumping, or disposal of any liquid, semi-solid or solid substance.

14. **"Environmentally Sensitive Areas (ESAs)"** means an area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments (See California Public Resources Code § 30107.5). ESAs include, but are not limited to, areas designated as Significant Ecological Areas by the County of Los Angeles (Los Angeles County Significant Areas Study, Los Angeles County Department of Regional Planning (1976) and amendments); areas designated as Significant Natural Areas by the California Department of Fish and Game's Significant Natural Areas Program and field verified by the Department of Fish and Game; and areas listed in the Basin Plan as supporting the "Rare, Threatened, or Endangered Species (RARE)" beneficial use.

15. “**Hazardous Material(s)**” means any material(s) defined as hazardous by Division 20, Chapter 6.95 of the California Health and Safety Code.

16. “**Illicit Connection**” means any man-made conveyance that is connected directly to the storm drain system, excluding roof-drains, and any other similar connection that serves as a pathway for any illicit discharge.

17. “**Illicit Discharge**” means any discharge to the storm drain system that is prohibited under local, state or federal statutes, ordinances, codes or regulations. Illicit discharges include all non-stormwater discharges except discharges pursuant to an NPDES permit or discharges that are exempted or conditionally exempted by the NPDES permit or granted as a special waiver or exemption by the Regional Board.

18. “**Impervious Surface**” means any man-made or modified surface that prevents or significantly reduces the entry of water into the underlying soil, resulting in runoff from the surface in greater quantities and/or at an increased rate, when compared to natural conditions prior to development. Examples of places that commonly exhibit impervious surfaces include parking lots, driveways, roadways, storage areas, and rooftops. The imperviousness of these areas commonly results from paving, compacted gravel, compacted earth, and oiled earth.

19. “**Industrial Activity**” means any public or private activity that is associated with any of the 11 categories of activities defined in 40 CFR 122.26(b)(14) and required to obtain a NPDES permit.

20. “**Industrial/Commercial Facility**” means any facility involved and/or used in either the production, manufacture, storage, transportation, distribution, exchange or sale of goods and/or commodities, and any facility involved and/or used in providing professional and non-professional services. This category of facility includes, but is not limited to, any facility defined by the Standard Industrial Classifications (SIC). Facility ownership (federal, state, municipal, private) and profit motive of the facility are not factors in this Definition.

21. **“LID”** means Low Impact Development.

22. “**Maximum Extent Practicable (MEP)**” means the standard for implementation of stormwater management programs to reduce pollutants in stormwater. MEP refers to stormwater management programs taken as a whole. It is the maximum extent possible taking into account equitable considerations and competing facts, including but not limited to, the gravity of the problem, public health risk, societal concern, environmental benefits, pollutant removal effectiveness, regulatory compliance, public acceptance, ability to implement, cost, and technical feasibility. Section 402(p) of the Clean Water Act requires that municipal permits shall require controls to reduce the discharge of

pollutants to the maximum extent practicable, including management practices, control techniques and systems, design and engineering methods, and other provisions as the Administrator or the State determines appropriate for the control of these pollutants.

23. "**National Pollutant Discharge Elimination System (NPDES)**" means a permit issued by the U.S. EPA, State Water Resources Control Board, or the California Regional Water Quality Control Board pursuant to the Clean Water Act that authorizes discharges to Waters of the United States and requires the reduction of pollutants in the discharge.

24. "**Non-Stormwater Discharge**" means any discharge to a municipal storm drain system that is not composed entirely of stormwater.

25. "**Person**" means any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity or any other legal entity, or their legal representatives, agents or assigns. The masculine gender shall include the feminine and the singular shall include the plural where indicated by the context.

26. "**Pollutant**" means any "pollutant" defined in Section 502(6) of the Federal Clean Water Act or incorporated into the California Water Code Sec. 13373. Pollutants may include, but are not limited to the following:

(a) Commercial and industrial waste (such as fuels, solvents, detergents, plastic pellets, hazardous substances, fertilizers, pesticides, slag, ash, and sludge);

(b) Metals (such as cadmium, lead, zinc, copper, silver, nickel, chromium, and non- metals such as phosphorus and arsenic);

(c) Petroleum hydrocarbons (such as fuels, lubricants, surfactants, waste oils, solvents, coolants, and grease);

(d) Excessive eroded soil, sediment, and particulate materials in amounts that may adversely affect the beneficial use of the receiving waters, flora or fauna of the State;

(e) Animal wastes (such as discharge from confinement facilities, kennels, pens, recreational facilities, stables, and show facilities); and

(f) Substances having characteristics such as pH less than 6 or greater than 9, or unusual coloration or turbidity, or excessive levels of fecal coliform, or fecal streptococcus, or enterococcus.

27. "**Receiving Waters**" means all surface water bodies within Los Angeles County that are identified by the Regional Board in a Basin Plan.

28. **"Redevelopment"** means land-disturbing activity that results in the creation, addition, or replacement of 500 square feet or more of impervious surface area on an already developed Site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of routine maintenance activity; and land disturbing activity related to structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety.

29. "**Regional Board**" means the California Regional Water Quality Control Board, Los Angeles Region.

30. "**Rules and Regulations**" shall mean Rules and Regulations adopted by the Board of Public Works Governing Pollution Control of Discharges into the Storm Drain System.

31. **"Site"** means land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

32. "**Storm Drain System**" means any facilities or any part of those facilities, including streets, gutters, conduits, natural or artificial drains, channels and watercourses that are used for the purpose of collecting, storing, transporting or disposing of stormwater and are located within the City of Los Angeles.

33. "**Storm Water or Stormwater**" means water that originates from atmospheric moisture (rainfall or snow melt) and that falls onto land, water, or other surfaces. Without any change in its meaning, this term may be spelled or written as one word or two separate words.

34. "**Stormwater Pollution Prevention Plan (SWPPP)**" means a plan required by and for which contents are specified in the State of California General Permit for Storm Water Discharges Associated with Industrial Activities or for Stormwater Discharges Associated with Construction Activities.

35. "**Stormwater Runoff**" means that part of precipitation (rainfall or snowmelt) which travels across a surface to the storm drain system or receiving waters.

36. "**Toxic Materials**" For purposes of compliance with the Los Angeles County Municipal Stormwater Permit, the term "toxic materials" means

any material(s) or combination of materials that directly or indirectly cause either acute or chronic toxicity in the water column.

37. "**Untreated**" means non stormwater runoff, wastewater or wash waters that have not been subjected to any applicable Treatment Control, Best Management Practices or are not in compliance with conditions of a separate or general NPDES permit.

38. "**Urban Runoff**" means surface water flow produced by storm and non-storm events. Non-storm events include flow from residential, commercial or industrial activities involving the use of potable and non-potable water.

Sec. 2. Section 64.72 of Article 4.4 of Chapter VI is amended to read as follows:

SEC. 64.72. STORMWATER POLLUTION CONTROL MEASURES FOR DEVELOPMENT PLANNING AND CONSTRUCTION ACTIVITIES

(A) Objective. The provisions of this Section contain requirements for construction activities and facility operations of Development and Redevelopment projects to comply with the requirements of the Standard Urban Stormwater Mitigation Plan, integrate LID practices and standards for stormwater pollution mitigation, and maximize open, green and pervious space on all Developments and Redevelopments consistent with the City's landscape ordinance and other related requirements in the Development Best Management Practices Handbook. LID shall be inclusive of SUSMP requirements.

(B) Scope. This Section contains requirements for stormwater pollution control measures in Development and Redevelopment projects and authorizes the Board to further define and adopt stormwater pollution control measures, develop LID principles and requirements, including but not limited to the objectives and specifications for integration of LID strategies, collect Best Management Practices compliance plan check fees, grant waivers from the requirements of the Standard Urban Stormwater Mitigation Plan, collect funds for projects that are granted waivers, conduct inspections, cite violators for infractions, and impose fines. Except as otherwise provided herein, the Board shall administer, implement and enforce the provisions of this Section.

(C) LID Requirements. All Developments and Redevelopments shall comply with the following:

1. Development or Redevelopment Involving four or Fewer Units Intended for Residential Use.

a. Development or Redevelopment less than one acre shall implement LID BMP alternatives identified in the Development Best Management Practices Handbook; and

b. Development or Redevelopment one acre or greater shall comply with the standards and requirements of this Article and with the Development Best Management Practices Handbook.

2. Development or Redevelopment Involving Nonresidential Use or five or More Units Intended for Residential Use.

a. Development or Redevelopment resulting in an alteration of at least fifty percent (50%) or more of the impervious surfaces on an existing developed Site, the entire Site must comply with the standards and requirements of this Article and with the Development Best Management Practices Handbook; and

b. Development or Redevelopment resulting in an alteration of less than fifty percent (50%) of the impervious surfaces of an existing developed Site, only such incremental Development shall comply with the standards and requirements of this Article and with the Development Best Management Practices Handbook.

3. A Development or Redevelopment of any size that would create 2,500 square feet or more of impervious surface area and is located partly or wholly within an ESA shall comply with the standards and requirements of this Article and with the Development Best Management Practices Handbook.

4. The Site for every Development or Redevelopment shall be designed to manage and capture stormwater runoff, to the maximum extent feasible, in priority order: infiltration, evapotranspiration, capture and use, treated through high removal efficiency biofiltration/biotreatment system of all of the runoff on site. High removal efficiency biofiltration/biotreatment systems shall comply with the standards and requirements of the Development Best Management Practices Handbook. A LID Plan shall be prepared to comply with the following:

a. Stormwater runoff will be infiltrated, evapotranspired, captured and used, treated through high removal efficiency Best Management Practices, onsite, through stormwater management techniques that comply with the provisions of the Development Best Management Practices Handbook. To the maximum extent feasible, onsite stormwater management techniques must be properly sized, at a minimum, to infiltrate, evapotranspire, store for use, treat through high removal efficiency biofiltration/biotreatment system, without any storm water runoff leaving the Site for at least the volume of water produced by the quality design storm event that results from:

(i) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

(ii) The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in the California Stormwater Best Management Practices Handbook – Industrial/Commercial, (2003); or

(iii) The volume of runoff produced from a 0.75 inch storm event.

For purposes of compliance with the LID requirements, and without changing the priority order of design preferences identified in this Section, all runoff from the water quality design storm event, as identified in Paragraph (a) of this Subdivision, that has been treated through an onsite high removal efficiency biofiltration/biotreatment system shall be deemed to have achieved 100% infiltration regardless of the runoff leaving the Site from an onsite high removal efficiency biofiltration/biotreatment system, and thus any runoff volume shall not be subject to the offsite mitigation requirement of this Article.

b. Pollutants shall be prevented from leaving the Site for a water quality design storm event as defined in Paragraph (a) of this Subdivision unless it has been treated through an onsite high removal efficiency biofiltration/biotreatment system.

c. Hydromodification impacts shall be minimized to natural drainage systems as defined in the MS4 Permit.

5. When, as determined by the Director, the onsite LID requirements are technically infeasible, partially or fully, as defined in the Development Best Management Handbook, the infeasibility shall be demonstrated in the submitted LID Plan, shall be consistent with other City requirements, and shall be reviewed in consultation with the Department of Building and Safety. The technical infeasibility may result from conditions that may include, but are not limited to:

a. Locations where seasonal high groundwater is within ten feet of surface grade;

b. Locations within 100 feet of a groundwater well used for drinking water;

c. Brownfield Development sites or other locations where pollutant mobilization is a documented concern;

d. Locations with potential geotechnical hazards;

e. Locations with impermeable soil type as indicated in applicable soils and geotechnical reports; and

f. Other site or implementation constraints identified in the Development Best Management Practices Handbook.

6. If partial or complete onsite compliance of any type is technically infeasible, the project Site and LID Plan shall be required to comply with all applicable Standard Urban Stormwater Mitigation Plan (SUSMP) requirements in order to maximize onsite compliance. For the remaining runoff that cannot feasibly be managed onsite, the project shall implement offsite mitigation on public and/or private land within the same sub-watershed out of the following five sub-watersheds: Upper Los Angeles River, Lower Los Angeles River, Ballona Creek, Santa Monica Bay, and Dominguez Channel. This shall include construction and perpetual maintenance of projects that will achieve at least the same level of runoff retention, infiltration and/or use, and water quality. All City Departments will assist the developer, when and where feasible, in the design, permitting and implementation of LID BMP projects within the public right of way, with a preference for utilizing the public right of way immediately adjacent to the subject development.

7. A Multi-Phased Project may comply with the standards and requirements of this Section for all of its phases by: (a) designing a system acceptable to the Bureau of Sanitation to satisfy these standards and requirements for the entire Site during the first phase, and (b) implementing these standards and requirements for each phase of Development or Redevelopment of the Site during the first phase or prior to commencement of construction of a later phase, to the extent necessary to treat the stormwater from such later phase. For purposes of this Section, "Multi-Phased Project" shall mean any Development or Redevelopment implemented over more than one phase and the Site of a Multi-Phased Project shall include any land and water area designed and used to store, treat or manage stormwater runoff in connection with the Development or Redevelopment, including any tracts, lots, or parcels of real property, whether Developed or not, associated with, functionally connected to, or under common ownership or control with such Development or Redevelopment.

8. The Director shall prepare, maintain, and update, as deemed necessary and appropriate, the Development Best Management Practices Handbook to set LID standards and practices and standards for stormwater pollution mitigation, including urban and stormwater runoff quantity and quality control development principles and technologies for achieving the LID standards. The Development Best Management Practices Handbook shall also include technical feasibility and implementation parameters, alternative compliance for

technical infeasibility, as well as other rules, requirements and procedures as the Director deems necessary for implementing the provisions of this Section of the Los Angeles Municipal Code. The Board of Public Works shall adopt the Development Best Management Practices Handbook no later than 90 days after the adoption of this Ordinance by the City Council and the Mayor.

9. The Director of the Bureau of Sanitation shall develop as deemed necessary and appropriate, in cooperation with other City departments and stakeholders, informational bulletins, training manuals and educational materials to assist in the implementation of the LID requirements.

10. The applicant can appeal the Director's determination of compliance with the provisions of this Article to the Board of Public Works within 30 days of the date of the determination.

11. Any Development or Redevelopment that is exempted from LID requirements under section D has the option to voluntarily opt in and incorporate into the project the LID requirements set forth herein. In such case, the Best Management Practices plan check fee associated with the project shall be waived and all LID related plan check processes shall be expedited.

12. Any Development or Redevelopment exempted from this Ordinance under section D shall comply with all applicable SUSMP requirements.

(D) Exceptions to LID Requirements. The provisions of this Section do not apply to any of the following:

1. A Development or Redevelopment that only creates, adds or replaces less than 500 square feet of impervious area;

2. A Development or Redevelopment involving only emergency construction activity required to immediately protect public health and safety;

3. Infrastructure projects within the public right-of-way;

4. A Development or Redevelopment involving only activity related to gas, water, cable, or electricity services on private property;

5. A Development or Redevelopment involving only re-striping of permitted parking lots;

6. A project involving only exterior movie or television production sets, or facades on an existing developed site.

(E) Other Agencies of the City of Los Angeles. All City of Los Angeles departments, offices, entities and agencies, shall establish administrative procedures necessary to implement the provisions of this Article on their Development and Redevelopment projects and report their activities annually to the Board of Public Works.

Sec. 3. Section 64.72.05 of Article 4.4 of Chapter VI of the Los Angeles Municipal Code is amended to read:

SEC. 64.72.05. LID PLAN CHECK FEES.

(A) Before review and approval of a set of plans and specifications for checking, the applicant shall pay a Best Management Practices plan check fee.

(B) The fee schedule for providing Best Management Practices plan check services for LID Implementation Plan, Standard Urban Stormwater Mitigation Plan (SUSMP), or Site Specific Mitigation Plan (SSMP) is as follows:

DEVELOPMENT CATEGORY	FEES
Development or Redevelopment less than 500 square feet	Exempt
Residential, 4 Units or Less:	
For Development or Redevelopment greater than or equal to 500 square feet and less than 2,500 square feet	$20 / Project
For Development or Redevelopment greater than or equal to 2,500 square feet	$200 / Project
Development or Redevelopment of any size that would create 2,500 square feet or more of impervious surface area and is located partly or wholly within an ESA*	$700 / Project
Nonresidential Use or 5 or More Units Intended for Residential Use:	
For Redevelopment that results in an alteration of less than fifty (50) percent of the impervious surfaces of an existing developed Site	$800 / Project
For new Development or where Redevelopment that results in an alteration of at least fifty (50) percent or more of the impervious surfaces of an existing developed Site	$1,000 / Project

* Projects located in, adjacent to, or discharging directly to a designated Environmentally Sensitive Area (ESA)

(C) At the discretion of the Bureau of Sanitation, a large scale project may be categorized as a Special Project and billed on actual cost incurred by the City.

(D) Off-hour Plan Check Fee. An applicant may apply to have the Bureau of Sanitation provide plan check services at other than normal working hours. If the Bureau approves an expedited application, the applicant must pay to the Bureau, in addition to the fees identified in Subsection B of this Section, an additional fifty percent of the fees owed.

(E) All entities, including City Departments and other public agencies, are required to pay the fees identified in Subsection B of this Section.

(F) All monies collected pursuant to the provisions of this Section shall be placed and deposited into the Stormwater Pollution Abatement Fund, under a separate account for each sub-watershed, established by Section 64.51.11 of this Code.

Sec. 4. The provisions of this Ordinance shall be operative 180 days after the effective date of the Ordinance, except that the provisions shall not apply to any of the following:

1. Any Development or Redevelopment for which the Department of Building and Safety accepted a permit application before the effective date of this Ordinance, and for which the permit applicant paid, before the effective date of this Ordinance, to the Department of Building and Safety all fees required by the Department to process the permit application; or

2. Any Development or Redevelopment for which a required entitlement application was filed with the Department of City Planning, and for which Department review of the application, with the exception of CEQA review, was deemed complete by the Department before the operative date of this Ordinance.

Sec. 5. If any provision of this Ordinance is found to be unconstitutional or otherwise invalid by any court of competent jurisdiction, such invalidity shall not affect the validity or enforceability of the remaining provisions of this Ordinance, and the provisions of this Ordinance are declared to be severable.

Sec. 6. The City Clerk shall certify to the passage of this ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that this ordinance was passed by the Council of the City of Los Angeles, at its meeting of SEP 27 2011.

JUNE LAGMAY, City Clerk

By _______________
Deputy

Approved OCT 07 2011

____
Mayor

Approved as to Form and Legality:

CARMEN A. TRUTANICH, City Attorney

By John A. Carvalho (PBE)
JOHN A. CARVALHO
Deputy City Attorney

Date Aug 5, 2011

File No. 09-1554

M:\GENERAL COUNSEL DIVISION\JOHN CARVALHO\ORDINANCES\LID\LID Ordinance 7-21-11 (1).doc

ORDINANCE NO. 173494

An ordinance amending Chapter IX Article I Section 91.106.4.1 adding Exception 15, Chapter VI Article I Section 61.09, Chapter VI Article 4.2 Section 64.51.13, and Chapter VI Article 4.4 Section 64.72 of the Los Angeles Municipal Code to provide storm water pollution control for planning, and construction of development and redevelopment projects.

WHEREAS, the City of Los Angeles is authorized by Article XI, §5 and §7 of the State Constitution to exercise the police power of the State by adopting regulations to promoting the public health, public safety and general prosperity;

WHEREAS, the City of Los Angeles has authority under the California Water Code to adopt and enforce ordinances imposing conditions, restrictions and limitations with respect to any activity which might degrade the quality of waters of the state;

WHEREAS, under the Constitution of the State of California and the California Government Code, the City of Los Angeles has the authority to define public nuisances and to protect the public health and safety of the residents of and visitors to the City of Los Angeles, and the environment, by abating public nuisances;

WHEREAS, in conformance with the General Plan Framework, the City of Los Angeles is committed to a stormwater management program that protects water quality by employing watershed-based approaches that balance environmental and economic considerations;

WHEREAS, the City of Los Angeles, along with neighboring municipalities within Los Angeles County has elected to become a permittee to the National Pollutant Discharge Elimination System Municipal Storm Water and Urban Runoff Discharge (herein after "NPDES") permit with the Los Angeles County as the Principal Permittee;

WHEREAS, Section 402(p) of the federal Clean Water Act, as amended by the Water Quality Act of 1987, requires that permits for municipal separate storm sewer system shall require controls to reduce discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants;

WHEREAS, as part of the NPDES Permit, models for Standard Urban Stormwater Mitigation Plan have been approved by the Executive Officer of Los Angeles Regional Water Quality Control Board for implementation to control storm water pollution from new development and redevelopment;

WHEREAS, this ordinance provides the necessary legal authority to comply with the requirements of the NPDES Permit and compliance with said NPDES Permit is exempt from the

California Environmental Quality Act pursuant to Public Resources Code §21100, et seq.

NOW, THEREFORE,

THE PEOPLE OF THE CITY OF LOS ANGELES
DO ORDAIN AS FOLLOWS:

Section 1. Chapter IX, Article 1, Section 91.106.4.1 of the Los Angeles Municipal Code is hereby amended by adding Exception 15 thereto, to read:

> 15. The Department of Building and Safety shall have the authority to withhold grading and/or building permits for developments until:

A. The applicant incorporates into the development, best management practices necessary to control stormwater pollution in accordance with the "Development Best Management Practices Handbook, Part B Planning Activities" adopted by the Board of Public Works as authorized by Section 64.72 of the Los Anglees Municipal Code; and

B. The City receives a Covenant & Agreement, signed by the owner and recorded by the Los Angeles County Recorder, declaring that the best management practices necessary to control stormwater pollution shall be installed and/or constructed and maintained in proper working condition at all times.

Sec. 2. Chapter VI, Article 1, Section 61.09 of the Los Angeles Municipal Code is hereby deleted.

Sec. 3. Chapter VI, Article 4.2, Section 64.51.13 of the Los Angeles Municipal Code is hereby amended by adding a new paragraph thereto, to read:

> Monies collected from waivers pursuant to Chapter VI, Article 4.4, Section 64.72.02 of the Los Angeles Municipal Code shall be placed and deposited into the Stormwater Pollution Abatement Fund. Such monies shall only be expended to promote regional or alternative solutions for stormwater pollution prevention.

Sec. 4. Chapter VI, Article 4.4, Section 64.72 of the Los Angeles Municipal Code is hereby amended to read as follows:

SEC. 64.72 STORMWATER POLLUTION CONTROL MEASURES FOR DEVELOPMENT PLANNING AND CONSTRUCTION ACTIVITIES

A) Objective. The provisions of this section set forth requirements for construction activities and facility operations of development and redevelopment projects to comply with the requirements of the Standard Urban Stormwater Mitigation Plan as defined by the "Development Best Management Practices Handbook" adopted by the Board of Public Works.

B) Scope. This section provides for the requirements of stormwater pollution control measures in accordance with the "Development Best Management Practices Handbook" adopted by the Board of Public Works. This section applies to development and redevelopment projects and authorizes the Board of Public Works to define and adopt stormwater pollution control measures, grant waivers from the requirements of the Standard Urban Stormwater Mitigation Plan, collect funds from projects that are granted waivers, conduct inspections, cite violators for infractions, and impose fines. Except as otherwise provided herein, the Board of Public Works shall administer, implement and enforce the provisions of this section.

C) Other Agencies of the City of Los Angeles. All agencies of the City of Los Angeles, including Department of Water and Power, Los Angeles World Airports, Port of Los Angeles, Community Development Department, Community Redevelopment Agency and Los Angeles Housing Authority, shall establish administrative procedures necessary to implement the provisions of this section on their development and redevelopment projects and report their activities annually to the Board of Public Works.

Sec. 5. Chapter VI, Article 4.4, Section 64.72 of the Los Angeles Municipal Code is hereby amended by adding Subsections 64.72.01, 64.72.02, 64.72.03, and 64.72. 04 to read as follows:

SEC. 64.72.01 Authority of the Board of Public Works

A) Define & Adopt Best Management Practices (BMPs). The Board of Public Works shall have the authority to define and adopt best management practices necessary to control stormwater pollution from construction activities and facility operations to the maximum extent practicable and place said requirements in the Board of Public Works' "Development Best Management Practices Handbook". The Board of Public Works may from time to time, as it deems appropriate, change, modify, revise or alter stormwater pollution control best management practices.

B) Granting of Waiver. The Board of Public Works shall have the authority to grant a waiver to a development or redevelopment project from the requirements of the Standard Urban Stormwater Mitigation Plan as defined in the "Development Best Management Practices Handbook" adopted by the Board of Public Works as authorized by this section of the Los Angeles Municipal Code.

SEC. 64.72.02 Funds Collected from Waiver

The Board of Public Works may collect from the applicant of a project that has been granted a waiver the cost in savings from such waiver, as determined by the Board of Public Works in accordance with the "Development Best Management Practices Handbook" adopted by the Board of Public Works as authorized by this section of the Los Angeles Municipal Code. Such collected funds shall be deposited in the Stormwater Pollution Abatement Fund as established by Section 64.51.13 of this code.

SEC. 64.72.03 Supplemental Provisions

Provisions of this section shall be complimentary to, not replaced by, any requirements for stormwater mitigation existing under the California Environmental Quality Act.

SEC. 64.72.04 Authority To Inspect and Enforce Stormwater Pollution Control Measures.

A) Violations. Notwithstanding the provisions of the grading, or building permit, non-compliance with any provisions of this section and, or the required Covenant & Agreement pursuant to Chapter IX Article I Section 91.106.4.1 Exception 15, shall be considered an infraction and may be punishable in accordance with Section 64.70.07, Subsection A, Subdivision 2 of this Article. Each day of non-compliance may be considered a separate violation.

B) Inspection. Whenever it is necessary to make an inspection to enforce or verify compliance with any stormwater control provision, as imposed by this article, Chapter IX of the Los Angeles Municipal Code Article 1 Section 91.106.4.1 Exception 14, and Chapter IX Article 1 Section 91.106.4.1 Exception 15, the Board of Public Works or its representatives are hereby authorized to enter such property at any reasonable time to inspect for compliance with best management practices and perform any duty imposed by this article and the provisions of Section 91.106.4.1 Exception 14 and 15 of this code, or other applicable law, provided that:

1. If such property be occupied, he/she shall first present proper credentials to the occupant and request entry explaining his/her reasons therefor; and

2. If such property be unoccupied, he/she shall first make a reasonable effort to locate the owner or other persons having charge or control of the property and request entry, explaining his/her reasons therefor. If such entry is refused or cannot be obtained because the owner or other person having charge or control of the property cannot be found after due diligence, the Board of Public Works or its representatives shall have recourse to every remedy provided by law to secure lawful entry and inspect the property.

Sec. 6. The City Council finds and declares that this ordinance is required for the immediate protection of the public peace, health and safety in accordance with the mandates as set forth by the Los Angeles Regional Water Quality Control Board to implement the SUSMP requirements. Therefore, this Ordinance shall become effective upon publication pursuant to Section 281 of the Los Angeles Charter.

Sec. 7. If any provision of this Ordinance is found to be unconstitutional or otherwise invalid by any court of competent jurisdiction, such invalidity shall not affect remaining provisions of this Ordinance are declared to be severable.

Sec. 8. The City Clerk shall certify to the passage of this ordinance and cause the same to be published in some daily newspaper printed and published in the City of Los Angeles.

I hereby certify that the foregoing ordinance was passed by the Council of the City of Los Angeles, at its meeting of SEP 06 2000.

J. MICHAEL CAREY, City Clerk

By [signature]
Deputy

Approved SEP 12 2000

Mayor
CNW

Approved as to Form and Legality

8/17/00
JAMES K. HAHN, City Attorney

By [signature]
CHRISTOPHER WESTHOFF
Assistant City Attorney

File Nos 99-2420 + 99-0951

57345

Green Infrastructure for Los Angeles:

Addressing Urban Runoff and Water Supply Through **Low Impact Development**

RB-AR16402

In memory of Dorothy Green,

whose dedication to creating healthy, sustainable waters for

Los Angeles and the state of California was an inspiration to us all.

Table of Contents

[1] Executive Summary **7**

Part I:
Understanding Low Impact Development

[2] What is Low Impact Development? **21**

Introduction 21

Key Principles of Low Impact Development 22

Best Management Practices & Green Infrastructure 22

Low Impact Development for Los Angeles 24

[3] Common LID Best Management Practices **26**

Landscape BMPs 27

Building BMPs 29

Street & Alley BMPs 31

Site Planning BMPs 33

Prioritizing LID Best Management Practices 34

[4] Benefits of Low Impact Development **36**

[5] Examples of LID Programs and Projects **44**

Maryland 44

Seattle, WA 45

Portland, OR 46

Chicago, IL 47

City of Ventura 48

County of Los Angeles 48

City of Los Angeles 50

Santa Monica 53

City of San Diego 54

Northern California 54

Part II:
Making LID Work for Los Angeles

[6] Funding and Maintaining a LID Program 60

How Much Does LID Cost? 60

Funding Strategies: Municipal Bonds 61

Fees & Assessments 62

Grants 67

Public-Private Partnerships 68

Emerging Markets 69

[7] Existing Stormwater Regulations & Green Infrastructure Programs in Los Angeles 73

Federal and State Regulations & Programs 73

Los Angeles County Regulations & Programs 75

City of Los Angeles Regulations & Programs 77

[8] Strategies to Codify Low Impact Development & Green Infrastructure 86

The Benefits of an Ordinance 86

Alternatives to a Stand-Alone LID Ordinance 87

[9] Defining the Scope of A LID Strategy for Los Angeles 91

To Whom Would LID Apply? 91

Encompassing New and Existing Development 92

Reaching Beyond Current Performance Standards 93

Contents of a LID Ordinance 94

[10] Considerations for LID Implementation 97

Defining LID Goals & Standards 97

Balancing Smart Growth and Infiltration 98

Administrative Challenges 99

LID Readiness & Education 101

Implementing LID Effectively 101

LID Knowledge, Data and Evaluation 102

Equity Issues 103

[11] Recommended Next Steps 104

Internal Review 104

Stakeholder Review 104

Analysis and Foundation Steps 104

Testing & Evaluation 105

Policy Development & Implementation 105

[12] Conclusion 106

Appendices

Appendix I: Additional LID Resources & Information 109

General Information About LID 109

Manuals & Technical Guides 110

Implementing LID in Los Angeles 111

Evaluating the Effectiveness of LID 112

Costs of Implementing LID 113

LID-Related Performance & Ratings Systems 114

Examples of LID Programs & Projects 114

Appendix II: LID Ordinances & Programs from Other Municipalities **116**

Los Angeles County: Low Impact Development Ordinance 117

City of Ventura: Green Streets Matrix 124

Appendix III: Research on the Costs of LID **131**

EPA Fact Sheet: Reducing Costs Though LID 132

Acknowledgements **135**

[1] Executive Summary

The purpose of this report is to examine low impact development (LID) for the City of Los Angeles and potential steps for instituting city-wide low impact development programs or projects. It also gathers policy strategies and technical information that could be pertinent to the City's LID efforts.

Part I (Chapters 2–5) describes the importance of low impact development and green infrastructure and highlights existing LID programs throughout the nation and here in Southern California. Part II (Chapters 6–11) explores potential ways to implement LID in Los Angeles and some of the issues that should be considered. It also reviews current policies and regulations (such as stormwater management laws and the City's recent Green Building Ordinance) that intersect with local LID programs. Finally, the appendices contain additional information and resources that may be helpful for developing comprehensive green infrastructure programs and projects for the City of Los Angeles.

Rio Hondo Golf Course parking lot in Downey, CA

What is Low Impact Development?

Stormwater pollution, water shortages, flood control, climate change and the availability of natural green space have all become pressing environmental issues for cities around the nation, including the City of Los Angeles. Fortunately, new strategies for runoff management using low impact development and green infrastructure offer promising solutions to many of these concerns.

Low impact development (LID) is an approach to stormwater management that emphasizes the use of small-scale, natural drainage features integrated throughout the city to slow, clean, infiltrate and capture urban runoff and precipitation, thus reducing water pollution, replenishing local aquifers and increasing water reuse.[1]

Key Principles of Low Impact Development

- Decentralize & manage urban runoff to integrate water management throughout the watershed.
- Preserve or restore the ecosystem's natural hydrological functions and cycles.
- Account for a site's topographic features in its design.
- Reduce impervious ground cover and building footprint.
- Maximize infiltration on-site.
- If infiltration is not possible, then capture water for filtration and/or reuse.

While conventional stormwater controls aim to move water off-site and into the storm drains as quickly as possible, LID seeks to do just the opposite—to keep as much water on-site as possible for absorption and infiltration in order to clean it naturally. LID focuses on controlling urban runoff and pollution at the source of the problem, rather than at the end of the storm drain outlet. A comprehensive approach to LID should include city-wide land development strategies and planning along with the creation of infrastructure for stormwater management.

Green Infrastructure

Green infrastructure refers to an interconnected network of natural features (vegetation, parks, wetlands, etc.) that provide beneficial "ecosystem services" for human populations. The benefits can include functions such as pollution removal, carbon sequestration and groundwater recharge.[2] [3] Low impact development and green infrastructure are often used interchangeably because the terms overlap, but it should be noted that LID focuses specifically on water management issues, while green infrastructure's scope can be broader. Green infrastructure is often used to refer to networks of parks and open lands that preserve habitats and ecosystem functions (usually created or protected by managing land uses), but the term can also encompass small-scale natural features such as trees planted along a city sidewalk. While green infrastructure is often used for water management purposes, it can also be used to tackle other issues such as air pollution, urban heat island effects, wildlife conservation and recreational needs.

Common LID Best Management Practices

A **best management practice (BMP)**[4] is a device or technique used to remove or reduce pollutants found in stormwater runoff, preventing the contamination of receiving waters.[a] It is important to note that LID primarily employs *natural* structural best management practices (such as vegetated swales, retention ponds and green roofs), not mechanical best management practices (such as water treatment facilities and manufactured filtration units). Examples of some of the most common LID best management practices are depicted on the next page; a more extensive selection can be found in Chapter 3. The best management practices generally fall into four categories: landscape BMPs, building BMPs, street and alley BMPs, and site planning BMPs.

Seattle's SEA Street (Street Edge Alternatives) project includes bioswales and permeable pavement.

[a] Receiving waters are lakes, rivers, oceans, and other types of waterways into which stormwater can flow.

Some Common LID Best Management Practices [5]

			
Vegetated Swales / Bioswales	Rain Gardens	Rain Cisterns	Green Roofs

			
Permeable Pavers	Porous Pavement	Curb Bump-Outs	Curb Cuts

The Benefits of LID for Los Angeles

Low impact development offers a wide range of community benefits. It improves flood control, relieves pressure on the sewage treatment system, prevents river and ocean pollution, reduces the demand for water use, augments groundwater aquifers, mitigates climate change, provides natural green space, increases the availability of green jobs, and saves money on the capital costs for stormwater management infrastructure.

The potential benefits of low impact development to help water pollution, water supply and energy usage in Los Angeles County are compelling. A study done by Community Conservancy International in March 2008 found that **nearly 40% of L.A. County's needs for cleaning polluted runoff could be met by implementing low impact development projects on existing public lands.** A net average of 15,000 acres of existing public lands in the county are suitable for LID projects.[6]

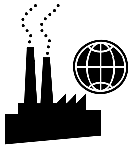
In addition, each ¼-acre of hardscape in Los Angeles has the potential to collect 100,000 gallons of rainwater per year.[7] A separate study by the Natural Resource Defense Council from January 2009[8] found that an increased use of LID practices throughout residential and commercial properties in L.A. County would promote groundwater recharge and water capture and reuse, reducing the county's dependence on distant sources of water. This increased use of LID would result in the **savings of 74,600–152,500 acre-feet of imported water** per year by 2030. Based on current per capita water usage in the City of Los Angeles, this is equivalent to the water consumption of 456,300–929,700 people.[9] Moreover, since L.A. County would be pumping less water from distant locations, **131,700–428,000 MWH of energy would be saved** per year by 2030, which is equivalent to the electricity used by 20,000–64,800 households.[10] Therefore, LID could also mitigate climate change by reducing greenhouse gases.

Bioswales at 1100 S. Hope Street in downtown L.A.

The following tables highlight some of the advantages that LID has to offer and provide interesting facts about the effectiveness of LID. Additional tables about flood control, wastewater management, water pollution, community improvements, and construction and building costs can be found in Chapter 4.

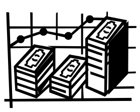
Water Supply & Demand

Issues	How LID Helps	Supporting Facts
• The L.A. area regularly faces water shortages and does not generate enough water to sustain itself. • Only 13% of L.A. City's water supply comes from local groundwater.[11] • 48% of L.A. City's water supply originates from the Mono Basin and Owens Valley aqueducts. • At least 30% of all the water used in the City of Los Angeles is used outdoors.[12]	• Decreases Los Angeles' dependence on outside sources of water. • Reduces the demand for irrigation water because rainwater is slowed and captured for infiltration into the ground. Some methods also capture water for reuse. • Increases the supply in the local water table. • Promotes or requires the use of drought-tolerant plants.	• Widespread use of water infiltration, capture and reuse in L.A. County would result in the savings of 74,600–152,500 acre-feet of imported water per year by 2030.[13] (Equivalent to the water consumption of 456,300–929,700 people.) • Each ¼-acre lot in L.A. has the potential to generate100,000 gallons of stormwater annually.[14] • By disconnecting 60,000 gutter downspouts, Portland diverted 1.5 billion gallons of stormwater per year. [15]



Climate Change

Issues	How LID Helps	Supporting Facts
• Fossil fuels are the #1 source of the greenhouse gases that cause climate change. • World temperatures could rise by between 2.0 and 11.5 °F during the 21st century.[16] • Blacktop surfaces can elevate surrounding city temperatures as much as 10°F. [17] • In the summer, central Los Angeles is typically 5°F warmer than surrounding suburban and rural areas due to the heat island effect.[18]	• Increasing the local water supply means that Los Angeles will use less energy pumping water from distant locations. • Trees and landscaping counteract climate change by absorbing excess carbon dioxide. • Shade from trees and evapotranspiration by plants reduce the heat island effect.	• Water systems account for 19% of the electricity used in the state of California.[19] • L.A. County could save 131,700–428,000 mWh of energy per year if less water was transported from Northern California.[20] (Equivalent to electricity use of 20,000–64,800 households.) • Each shade tree in L.A. prevents the combustion of 18kg of carbon annually and sequesters an additional 4.5–11kg of carbon per year. [21]



Green Jobs & Economy

Issues	How LID Helps	Supporting Facts
• The City of Los Angeles would like to encourage the development of "green-collar" jobs.[22] • The current economic recession has resulted in city budget cuts. More revenues are needed to fill the gaps.	• Encourages the growth of the green building industry. • Encourages the landscaping and gardening industry to shift to eco-friendly practices that emphasize native, drought-tolerant plants and rainwater harvesting. • Property drainage evaluations could increase the demand for "green industry" jobs in environmental assessment. • Trees and landscaping and reduced neighborhood flooding can enhance neighborhood property values, thus increasing tax revenues.	• L.A.'s Green Building Ordinance will create an anticipated 500 green-collar, union jobs.[23] • L.A.'s growing green building industry presents workforce development opportunities for auditors and landscapers and gardeners.[24] • Trees in Portland, OR generate approx. $13 million per year in property tax revenues by increasing real estate values.[25]

RB-AR16412

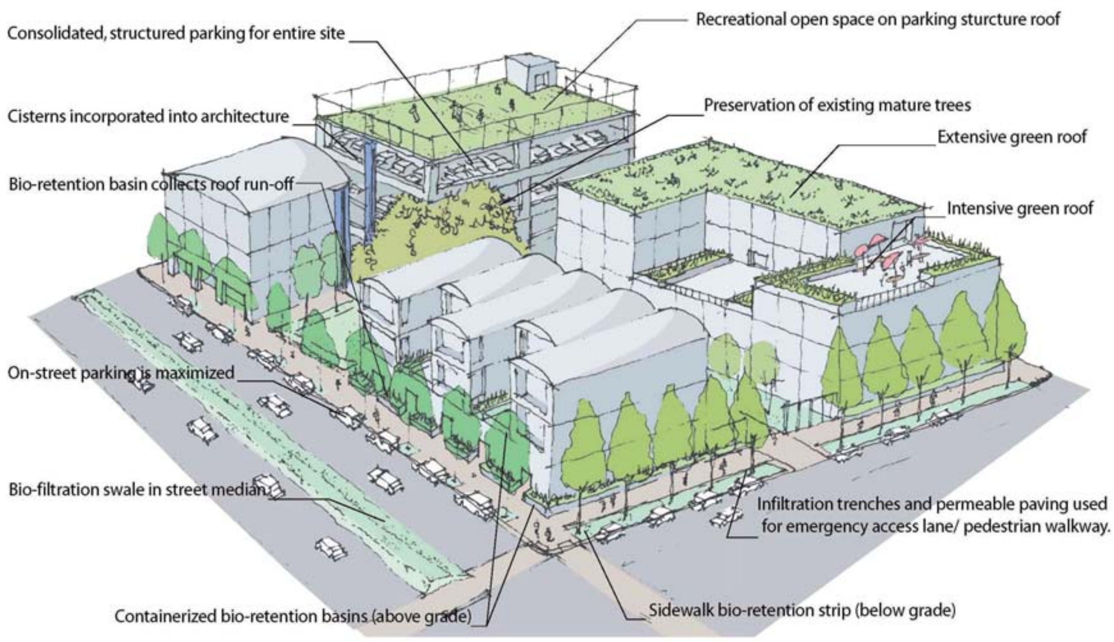


Illustration from the City of Emeryville's *"Stormwater Guidelines for Green, Dense Redevelopment"* manual depicting what LID might look like for a commercial development. *Credit: City of Emeryville / Community, Design + Architecture*

Examples of LID Programs, Projects and Regulations [26]

Many cities and counties across the country already have low impact development regulations, programs and projects underway, often pursued as an extension of a greater stormwater management, landscaping or sustainability program. Some particularly notable examples include the nation's first official LID program in Prince George's County (MD), Seattle's "Street Edge Alternatives" retrofit projects and their Green Factor building code (which requires properties to attain a certain level of permeability), numerous Green Streets projects in Portland (OR), Chicago's Green Alleys program, and Emeryville's program that promotes green, dense redevelopment.

The County of Los Angeles passed its Low Impact Development Ordinance in October 2008, which could offer a template for future LID efforts in the City of Los Angeles. The City of Los Angeles does not yet have a LID ordinance of its own, but it does have a number of pilot programs in place such as the Oros Street stormwater retrofit, Bimini Slough Ecology Park, the Green Streets LA program, and the Downspout Disconnect program. Other examples of LID in Southern California include the City of Ventura's Green Street policy, the City of San Diego's low impact development program, and Santa Monica's green building program.

Oros Street after its "green street" reconstruction (Los Angeles)

Existing Stormwater Regulations & Programs in Los Angeles

There are a number of stormwater regulations and green infrastructure programs originating from the federal, state, county and city levels of government that apply to the City of Los Angeles, providing a solid foundation for future LID efforts. Four key regulations and programs in the City of Los Angeles are the Standard Urban Stormwater Mitigation Plan, the Green Building Ordinance, the Landscape Ordinance and the Green Streets LA program.

The **Standard Urban Stormwater Mitigation Plan (SUSMP)** is part of L.A. County's Municipal Stormwater Permit, which applies to the City and addresses federal water pollution regulations by setting stormwater management requirements. In general, SUSMP applies to new developments and redevelopments of a certain minimum size.[27] It therefore does not apply to a large amount of existing development in Los Angeles. SUSMP best management practices must be able to infiltrate, capture and reuse, or treat all of the runoff from a site during an 85th percentile storm, which is equivalent to a ¾" storm. Although many of Los Angeles' existing low impact development BMPs were installed due to SUSMP requirements, SUSMP's primary goal is to reduce pollution levels; it only incidentally diverts stormwater to groundwater recharge areas. Additionally, the L.A. County Stormwater Permit must be reissued every five years, and its requirements can vary from permit to permit.

A vegetated swale with curb cuts in the parking lot of a shopping center at 8500 Firestone Blvd., Downey, CA.

The City of Los Angeles' **Green Building Ordinance** and **Landscape Ordinance** both have some LID features, but at this time neither addresses low impact development principles.[28] [29] Like SUSMP, they do not deal with existing development, and they do not specifically require significant use of green infrastructure BMPs.

The **Green Streets LA** program was initiated by the City Board of Public Works with the idea that Los Angeles' extensive street network offers an important opportunity to absorb, capture and filter urban runoff, which addresses pollution and groundwater recharge issues.[30] The Green Streets LA program has expanded the City's focus to include a broader array of LID practices. A preliminary set of Green Streets design guidelines were developed in 2008 and other measures are being planned to institutionalize low impact development.

How Much Does Low Impact Development Cost?

Pilot projects have shown that using low impact development techniques instead of conventional stormwater controls can result in considerable capital cost savings. **An analysis of LID projects from across the nation conducted by the U.S. Environmental Protection Agency (EPA) in 2007 found that with just a few exceptions, the capital costs of LID projects were less than conventional water management controls.** As shown in the table below, savings ranged from 15–80%.[31] (Please see Appendix III for a fact sheet about the report.) It is important to note that the EPA's analysis did not account for the value of the environmental, social and community benefits created by the projects.

Project [a]	Estimated Conventional Development Cost	Actual LID Cost	Cost Savings[b]	Percent Savings[b]
2nd Avenue SEA Street (Washington)	$868,803	$651,548	$217,255	25%
Auburn Hills (Wisconsin)	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall (Washington)	$27,600	$5,600	$22,000	80%
Bellingham Park (Washington)	$52,800	$12,800	$40,000	76%
Gap Creek (Arkansas)	$4,620,600	$3,942,100	$678,500	15%
Garden Valley (Washington)	$324,400	$260,700	$63,700	20%
Kensington Estates (Washington)	$765,700	$1,502,900	–$737,200	–96%
Laurel Springs (Wisconsin)	$1,654,021	$1,149,552	$504,469	30%
Mill Creek[c] (Illinois)	$12,510	$9,099	$3,411	27%
Prairie Glen (Wisconsin)	$1,004,848	$599,536	$405,312	40%
Somerset (Maryland)	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus (Illinois)	$3,162,160	$2,700,650	$461,510	15%

EPA Report:

Cost Comparisons Between Conventional and LID Approaches

Notes:

[a] Some of the case study results do not lend themselves to display in the format of this table (Central Park Commercial Redesigns, Crown St., Poplar Street Apartments, Prairie Crossing, Portland Downspout Disconnection, and Toronto Green Roofs).
[b] Negative values denote increased cost for the LID design over conventional development costs.
[c] Mill Creek costs are reported on a per-lot basis.

Source: "Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices." USEPA, 2007.

Research conducted by the City of Ventura may be helpful in determining the potential costs of implementing low impact development in Los Angeles, as Ventura is also located in Southern California and has a similar climate. A copy of Ventura's "Green Streets Matrix" is included in Appendix II. It contains an analysis of the costs, benefits, challenges and drawbacks for 17 different kinds of LID best management practices. The City of Los Angeles' Green Streets LA program is also in the process of developing its own cost estimates.

Low Impact Development for Los Angeles

Funding and Maintaining a LID Program

In a time of government budget cuts, searching for steady funding to support new public works projects and regular maintenance services has never been more important. Consistent maintenance of low impact development best management practices will ensure that they continuously perform at a high standard. Chapter 6 highlights more than a dozen strategies that could help secure a steady revenue stream for city projects and services. Ideas include municipal bonds, LID in-lieu fees, individualized parcel drainage fees with a rebate program, parking increment financing, using Quimby Fees for LID parks, public-private partnerships, and sales of L.A. City carbon offsets.

Strategies to Codify Low Impact Development

While a number of existing regulations and programs in Los Angeles touch on low impact development principles, the City could benefit from a comprehensive, enforceable ordinance that makes LID a common practice. **The two greatest advantages to enacting a LID ordinance—as opposed to relying exclusively on LID policies—are (1) enforcement, and (2) long-term reliability.** Nonetheless, a few alternative methods for implementing low impact development on a smaller scale include meeting SUSMP requirements using low impact development standards, revising the Landscape Ordinance to include LID standards, or enacting a LID ordinance after a voluntary pilot phase. These alternatives are further described in Chapter 8.

Defining the Scope of a LID Strategy for Los Angeles

Chapter 9 discusses issues that must be considered in order to define the appropriate scope and standards for a low impact development strategy in Los Angeles:

- Determining to whom LID should apply—government buildings, public infrastructure, private residences, commercial properties, industrial land, etc.
- Encompassing new and existing development to ensure that LID is implemented throughout the watershed for maximum results, possibly using a rebate program to encourage existing properties to install LID best management practices.
- Deciding how to safely include brownfields in a LID program.
- Setting new performance standards—should LID vary with soil type and the character of the local water table? Would it benefit L.A. to exceed current SUSMP standards?
- Suggestions for the potential contents of a comprehensive LID ordinance, program and standards manual.

A curb cut that directs water from the street into a bioswale. 1100 S. Hope Street in downtown Los Angeles.

Considerations for LID Implementation

Low impact development offers promising strategies for the City of Los Angeles to significantly improve stormwater management and increase water supply and green space while simultaneously reducing its impact on climate change and the environment in general. However, the city should consider a number of challenges before developing and implementing a comprehensive LID program. Chapter 10 explores the following issues:

- Defining LID goals and standards that are appropriate for Los Angeles.
- Balancing the City's smart growth and infiltration goals.
- Administrative challenges—which departments will administer LID? Are there any existing regulations that conflict with LID?
- LID readiness and education—do city employees, architects, landscape designers and professional gardeners have the knowledge to properly implement LID techniques?
- LID knowledge, data and evaluation—need to gather more information about the costs and effectiveness of using LID in dry climates.
- Equity issues—how can we ensure that implementing low impact development will not unfairly burden low income communities with a financial obligation that might be difficult to bear without a subsidy?

Recommended Next Steps

Chapter 11 recommends a number of steps that the City of Los Angeles can pursue to implement a more comprehensive low impact development (LID) and green infrastructure program. These recommendations can be summarized as:

1. Internal Review: review low impact development strategy with the City's Green Team, Green Streets Committee and City Council committees.
2. Survey and analyze current policies, ordinances and standards to identify potential conflicts with LID and green infrastructure. Make recommendations for necessary changes. (See Chapters 7 & 10.) Engineering and building & safety standard plans, practices, and ordinances should be a top priority. Also check fire and flood ordinances and insurance maps for conflicts with LID.
3. Integrate LID principles into the Conservation Element of the General Plan.
4. Integrate LID principles into a revised Landscape Ordinance, which the state requires every city to adopt by 2010. (See Chapter 7.)
5. Determine which groups need to be involved with LID brainstorming, review and feedback: environmental groups, developers, architects, landscape architects, planners, civil engineers, community organizations, gardening industry, etc.
6. Develop a working group to draft a LID ordinance.

Conclusion

Southern California was designed and built mostly in the 20th Century, and the prevailing idea at the time was to move water quickly and directly to the ocean. In the 21st Century, we have learned how to design our streets, sidewalks, and landscaping to soak up runoff through a more natural process, weaving the textures of nature into the fabric of the city. Low impact development is an emerging and important international stormwater management trend. We have begun to capitalize on the valuable services that nature can offer us: capturing, cleaning, and storing stormwater.

Nationwide research has proven that low impact development can be a cost effective solution to pressing problems pertaining to water quality and water supply, as well the other benefits noted in this paper, such as flood control, mitigation of climate change, and creation of more natural spaces. For instance, research conducted in Los Angeles has found that the City can significantly increase its water supply, ameliorate climate change issues, and address of much of the pollution found in urban runoff by converting its paved areas from gray to green. Moreover, implementing low impact development will create new, local "green-collar" jobs through the development of a workforce trained to install and maintain green infrastructure features.

The LID principles become particularly crucial as climate change impacts to our environment produce changing weather patterns that are currently predicted to result in longer term drought conditions throughout California. Harvesting all available rainwater by the various methods shown in this paper is an important means of addressing this looming problem.

The City of Los Angeles is well underway toward implementing the principles of low impact development into its designs for streets, sidewalks and alleys, through its Green Streets and Green Alleys program. With over 6,500 miles of streets and 900 miles of alleys, much could be accomplished by incorporating LID principles into new construction and by phasing in LID conversions for existing infrastructure. However, these paved areas only account for a portion of the hardscape found in Los Angeles, and thus only a portion of the stormwater burden. Implementation of low impact development on a wider and more intensive scale throughout the city is worth consideration, both on public and private property.

Endnotes

[1] Puget Sound Action Team, Washington State University Pierce County Extension. "Low Impact Development: Technical Guidance Manual for Puget Sound," p.1. January 2005. Accessed on 8/5/08, www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

[2] Benedict, Mark A. and Edward T. McMahon. The Conservation Fund. Sprawlwatch Clearinghouse Monograph Series, "Green Infrastructure: Smart Conservation for the 21st Century," p.5. Accessed on 8/10/08, http://www.sprawlwatch.org/greeninfrastructure.pdf

[3] U.S. Environmental Protection Agency. *Managing Wet Weather with Green Infrastructure.* Accessed on 8/10/08, http://cfpub.epa.gov/npdes/home.cfm?program_id=298

[4] U.S. Environmental Protection Agency. "Urban Stormwater BMP Performance Monitoring: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements," p.10. April 25, 2002. Accessed on 8/10/08, http://www.epa.gov/guide/stormwater/files/montch1and2.pdf

[5] *Photo credits for Common LID BMPs:* Vegetated swales = Capital Region District, British Columbia. Rain garden = Iowa Natural Resources Conservation Service. Rain cistern = EPA / Abby Hall. Green roof = City of Los Angeles Bureau of Sanitation. Permeable pavers = EPA / Abby Hall. Porous pavement = City of Los Angeles Watershed Protection Division, Planning and Engineering Section. Curb bump-out = EPA / Abby Hall. Curb cuts = Haan-Fawn Chau.

[6] Community Conservancy International. "The Green Solutions Project" report, March 2008. Executive Summary, p.ES-3. The report can be viewed at http://www.ccint.org/greensolution.html

[7] Estimates of potential stormwater runoff assuming an average yearly rainfall in Los Angeles of 15-inches on impervious surfaces. {Potential stormwater from a ¼-acre lot} = (0.25 x 43,560 sq.ft. per acre) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 101,835 gallons. An ordinary, 2-lane street is 30 feet wide. {Potential stormwater from a city street, not including sidewalks} = (500 ft. long) x (30 ft. wide) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 140,269 gallons. Calculation by the City of Los Angeles Bureau of Sanitation, November 2008.

[8] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices—Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[9] This calculation is based on the average daily per capita water use of Los Angeles residents from 2006-2007, which was 146 gallons per person per day. (According to the City of Los Angeles Department of Environmental Affairs website, http://www.lacity.org/EAD/2007environmental%20facts.htm, accessed on 2/22/09.) 146 gallons per day x 365 days per year = 53,290 gallons per person per year = .1635 AF/person/year. Conversion factor: 1 acre foot = 325,851 gallons. 74,600 AF per year saved / .1635 AF per person per year = the water used by 456,269 people. 152,000 AF per year saved / .1635 AF per person per year = the water used by 929,664 people.

[10] This calculation is based on the average monthly electricity use per household in the City of Los Angeles, which is 550 kWh. (According to the C40 Cities website, http://www.c40cities.org/bestpractices/renewables/la_renewable.jsp, accessed on 2/22/09.) 550 kWh per household per month x 12 months = 6,600 kWh = 6.6 mWh per household per year. 131,700 mWh saved per year / 6.6 mWh per household per year = 19,955 households per year. 428,000 mWh saved per year / 6.6 mWh per household per year = 64,848 households per year.

[11] *See Endnote #8.*

[12] Los Angeles Department of Water & Power. "City of Los Angeles Water Supply Action Plan," p.4. May 2008.

[13] *See Endnote #8.*

[14] Estimates of potential stormwater runoff assuming an average yearly rainfall in Los Angeles of 15-inches on impervious surfaces. {Potential stormwater from a ¼-acre lot} = (0.25 x 43,560 sq.ft. per acre) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 101,835 gallons. An ordinary, 2-lane street is 30 feet wide. {Potential stormwater from a city street, not including sidewalks} = (500 ft. long) x (30 ft. wide) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 140,269 gallons. Calculation by the City of Los Angeles Bureau of Sanitation, November 2008.

[15] Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning*, the magazine of the American Planning Association. August/September 2008. Pages 14-19.

[16] Intergovernmental Panel on Climate Change. "Climate Change 2007: Synthesis Report. Summary for Policy Makers." IPCC Fourth Assesment Report (AR4); Summary for Policy Makers. Accessed on 1/2/09, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

[17] Brasuell, James. *TreePeople Advocates for Practical and Holistic Solutions to Los Angeles' Environmental Crisis*, interview with Andy Lipkis. VerdeXchange News, Vol. 01: No. 03: June 2007. Accessed on 1/10/09, http://www.verdexchange.org/node/87

[18] Rosenfeld, Arthur H, Joseph J. Romm, Hashem Akbari, and Alan C. Lloyd. *"Painting the Town White—and Green."* Originally published in the February/March 1997 issue of MIT's Technology Review. Accessed on 1/5/09 from the Heat Island Group website: http://heatisland.lbl.gov/PUBS/PAINTING/

[19] *See Endnote #8*

[20] *See Endnote #8*

[21] Akbari, H. "Shade Trees Reduce Building Energy Use and CO_2 Emissions From Power Plants." *Environmental Pollution* 116 (2002) S119–S126. Accessed on 1/4/09, http://www.fs.fed.us/psw/programs/cufr/products/12/psw_cufr703_Akbari_Reduce_Energy_Use.pdf

[22] City of Los Angeles, Office of Mayor Antonio Villaraigosa. *Energy & Environment: Green LA.* Accessed on 2/3/09, http://mayor.lacity.org/villaraigosaplan/EnergyandEnvironment/LACITY_004467.htm

[23] Schmitz, Rob. *L.A. considers green building codes.* November 28, 2008. Accessed on 1/7/09 from the American Public Media: Marketplace website: http://marketplace.publicradio.org/display/web/2008/11/28/green_jobs/

[24] Rosner, Signalle. "Job Implications in Los Angeles' Green Building Sector," May 2006. Accessed on 1/7/09 from the Green for All website: http://www.greenforall.org/resources/job-implications-in-los-angeles-green-building

[25] USDA Forest Service, Pacific Northwest Research Station. *Study shows that street trees increase the value of Portland homes by more than $1 billion*, March 10, 2008. Accessed on 1/3/09, http://www.fs.fed.us/pnw/news/2008/03/trees.shtml

[26] Please see the source citations in Chapter 5 for more information about this section.

[27] State of California, California Regional Water Quality Control Board, Los Angeles Region. "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach." Order No. 01-182, NPDES Permit No. CAS004001. December 13, 2001.

[28] City of Los Angeles, Department of City Planning. "Building a Green Los Angeles: Framework for the City's Green Building Program," May 2008. Accessed on 8/13/08, http://cityplanning.lacity.org/code_studies/GreenLa/Brochure.pdf

[29] City of Los Angeles, Department of City Planning. "Los Angeles City Planning Department Recommendation Report." Report to the City Planning Commission, February 10, 2005. Case No: CPC-1992-0043-CA, CEQA: ENV-2003-7106-CE. Accessed on 8/6/08, http://cityplanning.lacity.org/Code_Studies/Other/landscape.pdf

[30] Daniels, Paula. (City of Los Angeles, Board of Public Works). "Green Streets LA" presentation. Accessed July 2008 from the Local Government Commission website, http://water.lgc.org/water-workshops/la-workshop/Green_Streets_Daniels.pdf/view

[31] U.S. Environmental Protection Agency. *Fact Sheet: Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007. From the Polluted Runoff (Nonpoint Source Pollution) web page. Accessed on 1/3/09, http://www.epa.gov/owow/nps/lid/costs07/factsheet.html

Part I:

Understanding Low Impact Development

A multi-family home in Santa Monica that utilizes drought-tolerant landscaping and a rain barrel to capture water for reuse.

[2] What is Low Impact Development?

Introduction

Stormwater pollution, water shortages, flood control, climate change and the availability of natural green space have all become pressing environmental issues for cities around the nation, including the City of Los Angeles. These concerns affect not only the city's environmental quality, but also our long-term quality of life. **This report takes a look at how a low impact development program in the City of Los Angeles could offer promising solutions to many of the city's environmental concerns, especially those related to water management.**

Rio Hondo Golf Course parking lot in Downey, CA

Low impact development (LID), as defined by Washington State University's Puget Sound Action Team, "is a stormwater management strategy that emphasizes conservation and the use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial and industrial settings."[1]

Low impact development takes a very different approach to water management as compared to conventional stormwater strategies. Conventional methods aim to move water off-site and into the storm drains as quickly as possible, while LID seeks to do just the opposite—keep as much water on-site as possible for absorption and infiltration. Instead of large, centralized treatment plants and water storage facilities, LID emphasizes local, decentralized solutions that capitalize on the beneficial services that natural ecosystem functions can provide. LID also focuses on controlling urban runoff and pollution right at the source, rather than at the end of the storm drain outlet. For example, a landscaped area may rely on natural soils to simultaneously absorb stormwater, filter out contaminants, and recharge the groundwater supply.

A comprehensive approach to LID should include city-wide land development strategies and planning along with the creation of infrastructure for stormwater management. As discussed in greater detail in Chapter 4, low impact development is most effective when it is applied on a wide scale. Additionally, it is important to note that LID encompasses much more than just water infiltration—it slows down water velocities (preventing floods downstream), filters out pollutants, and captures and stores water for later reuse.

Key Principles of Low Impact Development

A number of key principles characterize the goals of low impact development: [2 3]

- Decentralize and micromanage urban runoff to integrate water management throughout the watershed.
- Preserve or restore the ecosystem's natural hydrological functions and cycles.
- Emphasize a distributed (not concentrated) control of stormwater.
- Account for a site's topographic features in its design.
- Reduce impervious ground cover and building footprint.
- Maximize infiltration on-site.
- If infiltration is not possible, then capture water for filtration and/or reuse.

At its most basic level, low impact development strives to slow, clean, infiltrate and capture urban runoff and precipitation through natural processes in order to increase groundwater recharge and water reuse.

Best Management Practices & Green Infrastructure

Best Management Practices (BMPs)

A wide array of techniques and features can be used to design a low impact development project. LID sites rely heavily on natural, small-scale structural best management practices to achieve their water management goals. According to the U.S. Environmental Protection Agency, a **best management practice (BMP)** is a device or technique used to remove or reduce pollutants found in stormwater runoff, preventing the contamination of receiving waters.[4] It is important to note that LID primarily employs *natural* structural BMPs (such as vegetated swales, retention ponds, green roofs), not mechanical BMPs (such as water treatment facilities and manufactured filtration units).

Key Terms

Low Impact Development (LID)

"A stormwater management strategy that emphasizes conservation and the use of existing natural site features integrated with small-scale stormwater controls to mimic natural hydrologic patterns." *(Puget Sound Action Team 2005)*

Best Management Practice (BMP)

A device or technique used to remove or reduce pollutants found in stormwater runoff, preventing the contamination of receiving waters. *(EPA 2002)*

Green Infrastructure

[1] "An interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations." *(The Conservation Fund)*

[2] Large scale and small-scale stormwater "management approaches and technologies that infiltrate, evapotranspire, capture and reuse stormwater to maintain or restore natural hydrologies." *(EPA)*

LID is Not LEED

Low impact development (LID) should not be confused with LEED, which stands for "Leadership in Energy and Environmental Design." LEED is a program run by the U.S. Green Building Council and is used to certify eco-friendly buildings and construction practices. While some features of LEED green buildings (green roofs, pervious pavement, etc.) fulfill the goals of low impact development, the two terms are not synonymous.

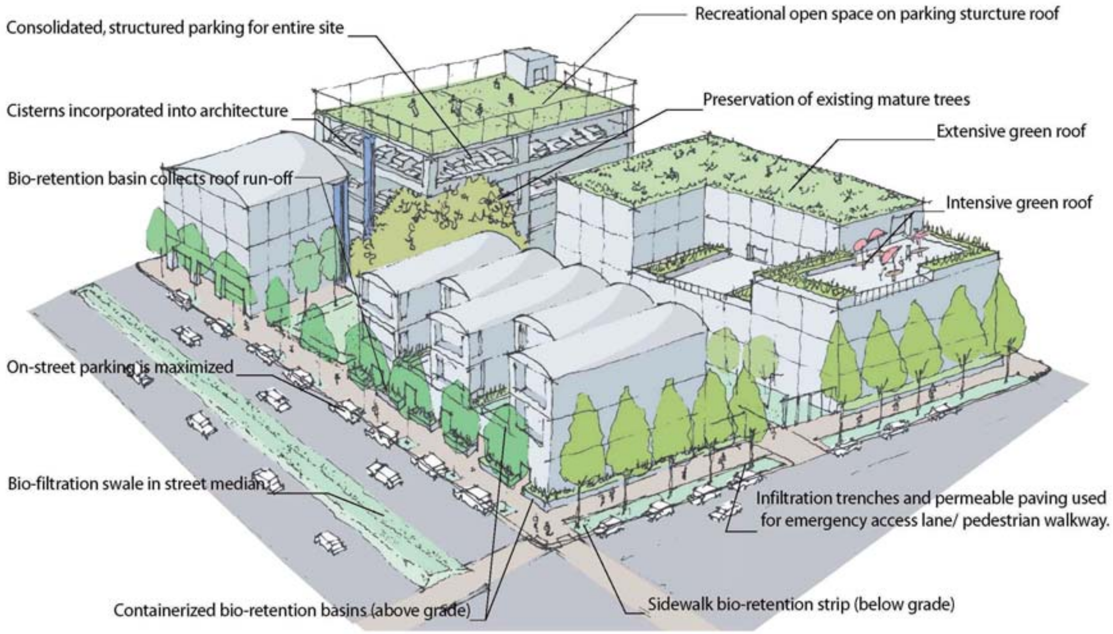


Illustration from the City of Emeryville's *"Stormwater Guidelines for Green, Dense Redevelopment"* manual depicting what LID might look like for a commercial development. *Credit: City of Emeryville / Community, Design + Architecture*

Green Infrastructure

In recent years, "green infrastructure" has become an important concept in the field of urban sustainability. Like many new terms, there is not yet one standard definition, but there is agreement on the principles. The Conservation Fund in Washington, DC states that "green infrastructure is defined as an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations."[5]

The EPA defines green infrastructure as a stormwater management strategy that is closely intertwined with natural BMPs. The EPA website says that green infrastructure uses stormwater "management approaches and technologies to infiltrate, evapotranspire,[a] capture and reuse stormwater to maintain or restore natural hydrologies. At the largest scale, the preservation and restoration of natural landscape features (such as forests, floodplains and wetlands) are critical components of green stormwater infrastructure. On a smaller scale, green infrastructure practices include rain gardens, porous pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting for non-potable uses such as toilet flushing and landscape irrigation."[6]

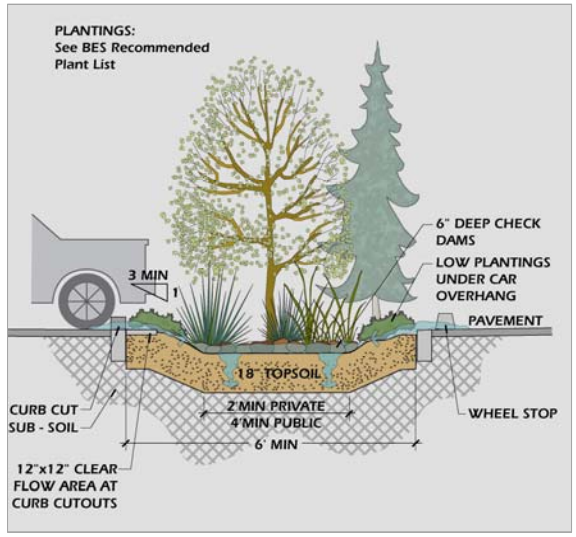
In either case, a city with a robust green infrastructure system can reap multiple benefits from the increased services that nature provides, especially with regards to stormwater management, increased

[a] Evapotranspire refers to the processes of evaporation and transpiration carried out by plants and trees.

local water supply, and pollution control. It should be noted that "low impact development" and "green infrastructure" are often used interchangeably because the terms overlap, but LID focuses specifically on water management issues, while green infrastructure's scope is broader. Green infrastructure can be used to tackle other issues besides stormwater management, such as air pollution, urban heat island effects, wildlife conservation and recreational needs.

Low Impact Development for Los Angeles

Many other municipalities have already embarked on the road to implementing low impact development and have found that stormwater improvements can even be made to large, built-out cities like Los Angeles. A number of cities, counties, federal agencies, and national and local nonprofit organizations have conducted research and published documents on LID and green infrastructure. Additionally, there are existing local LID pilot projects such as Oros Street and Elmer Avenue along the Los Angeles River. **Together, these regulations, programs, technical manuals, pilot projects and research reports offer a wealth of existing information and resources from which the City of Los Angeles could model its own low impact development ordinance and programs.**



Cross section design for a vegetated swale in a parking lot.
Bureau of Environmental Services, Portland, OR / Tom Liptan

Because Los Angeles has significant amounts of water runoff even during dry weather, low impact development can benefit the city year-round, not just during the rainy season. However, not all sites will be able to achieve every goal that LID sets forth for water management (slowing, cleaning, infiltration, capture, groundwater recharge, and reuse). Some sites may only achieve one outcome, while others may fulfill all six. For instance, near the Los Angeles River, infiltration and groundwater recharge can be difficult because the ground is composed of impenetrable clay. There, it would be best to place emphasis on slowing and cleaning water flows before they reach the river.

A curb cut and bioswale at 1100 S. Hope Street
in downtown Los Angeles.

The Purpose of This Report

The purpose of this report is to examine low impact development (LID) for the City of Los Angeles and potential steps for instituting city-wide low impact development programs or projects. It also gathers policy strategies and technical information that could be pertinent to the City's LID efforts. Part I (Chapters 2–5) describes the importance of low impact development and green infrastructure and highlights existing LID programs throughout the nation and here in Southern California. Part II (Chapters 6–11) explores potential ways to implement LID in Los Angeles and some of the issues that should be considered. It also reviews current policies and regulations (such as stormwater management laws and the City's recent Green Building Ordinance) that intersect with local LID programs. Finally, the appendices contain additional information and resources that may be helpful for developing comprehensive green infrastructure programs and projects for the City of Los Angeles.

Green roof on top of Chicago City Hall.
Dept. of Energy, NREL / Katrin Scholz-Barth

Endnotes

[1] Puget Sound Action Team, Washington State University Pierce County Extension. "Low Impact Development: Technical Guidance Manual for Puget Sound," p.1. January 2005. Accessed on 8/5/08, www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

[2] Prince George's County (Maryland), Department of Environmental Resource, Programs and Planning Division. "Low Impact Development Design Strategies: An Integrated Approach," p. 1.2--1.6. June 1999. Accessed on 8/6/08, www.lowimpactdevelopment.org/pubs/LID_National_Manual.pdf

[3] Puget Sound Action Team, Washington State University Pierce County Extension. "Low Impact Development: Technical Guidance Manual for Puget Sound," chapter 1. January 2005. Accessed on 8/5/08, www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

[4] U.S. Environmental Protection Agency. "Urban Stormwater BMP Performance Monitoring: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements," p.10. April 25, 2002. Accessed on 8/10/08, http://www.epa.gov/guide/stormwater/files/montch1and2.pdf

[5] Benedict, Mark A. and Edward T. McMahon. The Conservation Fund. Sprawlwatch Clearinghouse Monograph Series, "Green Infrastructure: Smart Conservation for the 21st Century," p.5. Accessed on 8/10/08, http://www.sprawlwatch.org/greeninfrastructure.pdf

[6] U.S. Environmental Protection Agency. *Managing Wet Weather with Green Infrastructure.* Accessed on 8/10/08, http://cfpub.epa.gov/npdes/home.cfm?program_id=298

[3] Common LID Best Management Practices

Despite its semi-arid climate, the City of Los Angeles has the potential to generate a remarkable amount of stormwater over the course of a year. **Each ¼-acre of hardscape has the potential to generate 100,000 gallons of stormwater runoff annually, and a 500-foot long residential street in Los Angeles could generate 140,000 gallons of stormwater.**[a] This chapter highlights a wide array of low impact development (LID) best management practices (BMPs) that are available to capture, treat, infiltrate and reuse potential water resources. Many BMPs, such as bioswales, can be applied to streets, houses, commercial development, and even industrial sites, while other BMPs (such as rain barrels for single-family homes) tend to have a narrower range of use. Projects may combine several BMPs that work together to slow down stormwater flow and infiltrate it into the ground. For instance, a single "green street" can utilize porous pavement, bioswales, bump-outs, and curb cuts all together.

Property owners can select the most appropriate BMPs to accomplish infiltration, water reuse or runoff control at their particular location. In keeping with LID principles, it is important to evaluate what existing resources on-site can be retained and reused to promote groundwater infiltration, such as top soil, established trees or natural topographic features. The suitability of soil conditions to support vegetation or infiltration can help narrow the number of BMPs to be considered. The long-term maintainability of any BMP must be factored into all decisions as an underlying driver for sustainability. Consideration of all these factors can reduce monetary costs for the owner as well as reduce "external" costs for the city overall (conserving water, reducing amount of soil sent to landfills, etc.).

Fundamental LID Objectives

Low impact development strives to **slow, clean, infiltrate and capture** urban runoff and precipitation in order to increase groundwater recharge and water reuse.

Types of LID Best Management Practices

1. Landscape BMPs
2. Building BMPs
3. Street and Alley BMPs
4. Site Planning BMPs


Capital Region District, BC

[a] Estimates of potential stormwater runoff assuming an average yearly rainfall in Los Angeles of 15-inches on impervious surfaces. {Potential stormwater from a ¼-acre lot} = (0.25 x 43,560 sq.ft. per acre) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 101,835 gallons. An ordinary, 2-lane street is 30 feet wide. {Potential stormwater from a city street, not including sidewalks} = (500 ft. long) x (30 ft. wide) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 140,269 gallons. Calculation by the City of Los Angeles Bureau of Sanitation, November 2008.

Landscape BMPs

Landscape-based BMPs that use runoff to support vegetation are particularly effective in satisfying the City's LID goals. For instance, the City's million trees initiative (Million Trees LA) directly recognizes the important role of trees in the capture and reuse of water, plus the additional benefits they provide by absorbing CO_2 (a greenhouse gas) and shading city streets to reduce the urban "heat island effect." Native trees are well-suited as landscape BMPs because of their ability to use large amounts of water when available, but can still withstand long periods of reduced soil moisture. Overall, integrating trees throughout the city could result in cooler temperatures, improved aesthetics, improved water quality, and enhanced property values.

Past development practices often employed engineered solutions to stormwater management instead of preserving a site's original soil conditions and natural drainage patterns. Unfortunately, the impact of these many small decisions has resulted in the loss of the Los Angeles region's ability to infiltrate groundwater, an increase in local temperatures and a negative impact to water quality. Over time, landscape practices based on low impact development can mitigate many of the unfavorable impacts of prior development and change Los Angeles into a city that
has more sustainable water management practices.

	**Vegetated Swales** A vegetated swale is a broad, shallow channel with a dense stand of vegetation covering the side slopes and the bottom. Swales can be natural or manmade, and are designed to trap particulate pollutants (suspended solids, trace metals), promote infiltration, and reduce flow velocity from stormwater runoff.[1] *Photo credit: Capital Region District, British Columbia*
	**Bioswales** Bioswales are landscape elements, very similar to vegetated swales, designed to remove silt and pollution from surface runoff water. They direct drainage with gently sloped sides (less than 6%) and are filled with vegetation, compost and/or rip rap. The water's flow path is designed to maximize the time water spends in the swale.[2] *Photo: Westchester/Imperial Highway Infiltration Swale Project* *Credit: LA BOS*

RB-AR16428

	**Rain Gardens** A rain garden, created in a low spot on a property, captures rain and excess irrigation water from roofs, driveways and yards. Runoff is directed into the rain garden to support landscapes and for infiltration to ground water. In a sense, a rain garden is a “mini-bioretention” swale that can be particularly well-suited for residential properties. Supplemental irrigation may be required during the dry season in Los Angeles. *Photo credit: Iowa Natural Resources Conservation Service, http://www.ia.nrcs.usda.gov/features/raingardens.html*
	**Infiltration Swales / Basins / Trenches** Infiltration swales are designed for conveyance and infiltration, with less emphasis on growing vegetation.[3] They are depressions created by excavation, berms, or small dams placed in a channel intended to infiltrate the storm runoff from impervious surfaces. Infiltration basins and trenches serve similar purposes as swales, but the tops may be hidden with covers that could range from landscaping to a porous material, such as decomposed granite. *Photo: Pavers and infiltration swale at Taylor Yard near Elysian Valley* *Credit: LA BOS*
	**Riparian Buffers** Riparian buffers are strips of vegetated land adjacent to a river or stream. In addition to providing wildlife habitat, the grasses, shrubs and trees along stream banks capture sediments and pollutants and prevent erosion. They also slow down flow velocities, allowing more water to percolate into the ground.[4] *Photo: Los Angeles River near Atwater Village* *Credit: LA BOS*
	**Open Space & Parks** Open space and parks provide large, vegetated areas especially well suited for infiltrating runoff on a regional scale. Additional benefits include increased wildlife habitat and recreation opportunities. *Photo: Sepulveda Basin Wildlife Refuge in the Encino area of L.A* *Credit: LA BOS*

Building BMPs

Building-based low impact development BMPs often focus on directly capturing and storing stormwater, but they can also be designed to slow and filter runoff, and reduce the sediments flowing into various water bodies. Building BMPs also improve water quality, reduce the heating and cooling requirements of buildings, and improve aesthetics. Capturing runoff from buildings or other impermeable surfaces for reuse can be done on different scales, ranging from small rain barrels to the construction of large underground cisterns. Even though Los Angeles is considered a dry climate because rainfall occurs during a relatively short season, there is still considerable potential to capture significant amounts of water.

Green roofs are especially innovative building BMPs. Both locally and around the country, green roofs (sometimes called "living roofs") have been installed to reduce runoff and provide attractive open spaces in unexpected locations. Green roof BMPs have most often been used in areas where rainfall is distributed more evenly throughout the year when compared to Los Angeles. However, in combination with other collection-oriented BMPs, green roofs cannot be ruled out for Los Angeles, especially when value is placed on potential energy savings and microclimate improvements. Green roof concepts will need to be adapted to the unique microclimates found in Los Angeles.

	**Green Roofs** Placement of rooftop planting system that allows for sustained presence of live plants covering a significant portion of a building's roof. Green roofs can provide a range of environmental (stormwater runoff reduction, energy savings), economic, and social benefits.[5] *Photo: Vista Hermosa Park, Santa Monica Mountains Conservatory, Los Angeles* *Credit: LABOS*
	**Cisterns** Reservoirs, tanks, or containers can be used to store stormwater for non-potable reuse (such as landscape irrigation). Cisterns are usually placed underground, but can also sit above ground. The cistern system on the left directs rainfall from the roof through a sand pit to filter out impurities; it then collects the water in an underground cistern. Cisterns can vary in size from smaller household units to large underground storage areas beneath outdoor playing fields. These features can also be made into attractive architectural elements. A pump may be required to harvest the water for reuse. *Photo: Cistern in Chicago. Credit: EPA / Abby Hall*

	**Rain Barrels** Rain barrels are used to store rainwater for later reuse. Gutters and downspouts direct rainfall from rooftops into the barrels. Rain barrels are smaller and less expensive than cisterns, making them more appropriate for residential buildings. Most barrels have spigots so that the water can be easily accessed for irrigation. Rain barrels are made from a variety of materials and can be an attractive landscape feature. They commonly have provisions to prevent mosquitoes from breeding. *Photo Credit: http://www.greenerbuilding.org/*
	**Rain Chains** A rain chain is a creative and attractive form of water diversion from rain gutters to the collection system; it is an alternative to the more utilitarian downspout. Rain chains consist of metal cups or chains linked to direct and slow rooftop runoff to a desired catchment area. Architect Frank Lloyd Wright often used these as an architectural element; the concept originated in Japan centuries ago where they are known as “kusari doi.”[6] *Photo: A home in West Los Angeles* *Credit: Haan-Fawn Chau*

Street and Alley BMPs

The 6,500 miles of streets[7] and 914 miles[8] of alleys in the City of Los Angeles have tremendous potential for reducing the velocity of water flows, decreasing polluted runoff and augmenting water infiltration. In general, Los Angeles is highly urbanized, and the ability to apply relevant street and alley BMPs is mostly a function of redevelopment opportunities. For instance, city roadwork projects can be used to "green" city streets and sidewalks with porous pavement, curb cuts and bioswales. The successful application of these BMPs will also depend upon the development of standards acceptable to the City (to reduce liability) and the development of financial and aesthetic incentives. Additional benefits common to most of these BMPs are aestethic improvements to the local neighborhood.

Porous Pavement & Sidewalks
Porous/permeable/pervious pavement and sidewalks absorb water, allowing infiltration into the soil layer below. They are especially appropriate for highly urbanized areas where open space is scarce. Porous pavement usually needs to be vacuum swept periodically to keep pores unclogged. Side benefits: (1) reduces danger of hydroplaning for cars, (2) some porous pavements absorb and store less heat, so they can help reduce temperatures in an urban environment.[9]

Photo credit: City of Los Angeles Watershed Protection Division, Planning and Engineering Section

Permeable Pavers
Permeable pavers allow water to percolate through crevices between paving blocks. They come in a variety of styles, shapes and sizes. Cobblestones are a popular example.

Photo Credit: Permeable Pavers, EPA / Abby Hall

Vegetated Pavers / "Grasscrete"
This well-established BMP can be met with numerous commercial products. Vegetated pavers help natural infiltration by reducing the overall imperviousness of otherwise paved areas. They can be used for sidewalks, driveways, and parking lots. They address stormwater through small, cost-effective, attractive landscape features located at the lot level. They may be suitable for emergency access where other BMPs may not.

Photo credit: Haan-Fawn Chau

<table>
<tr><td></td><td>Bump-Outs
“Bump-Outs” are small vegetated swales that can be used in well-established neighborhoods where other options for infiltration may be limited. Not only can they be functional for reducing runoff, but they can also provide an attractive focal point for a street and can be used to slow traffic to improve pedestrian safety.

Photo: Portland, OR. Credit: EPA / Abby Hall</td></tr>
<tr><td></td><td>Curb Cuts
Curb cuts can be used to direct runoff from paved areas into infiltration zones such as bioswales. They allow stormwater runoff to enter a vegetated area and infiltrate the underlying root system or soil medium.

Photo: Hope Street, downtown Los Angeles. Credit: Haan-Fawn Chau</td></tr>
<tr><td></td><td>Tree Wells
Tree wells can be installed upstream of a catch basin to intercept urban runoff from a gutter (up to a certain volume). The runoff is used to irrigate the tree and local landscaping, and provides infiltration. During heavy rains, the excess water beyond the capacity of the tree well flows into the catch basin. Tree wells are placed below grade so trash is also intercepted, which is then manually removed on a periodic basis.

Photo: Hope Street, downtown Los Angeles. Credit: Haan-Fawn Chau</td></tr>
</table>

RB-AR16433

Site Planning BMPs

The most important low impact development BMPs often occur during a project's planning phase, well before any "green infrastructure" features are installed. Properly planning the layout of a site to enhance natural drainage patterns and developing a strategy to preserve the infiltration capacity of the existing soil during construction can make an significant difference in the success of a LID project.

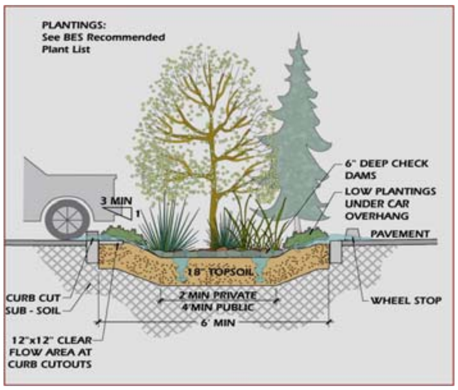
<table>
<tr>
<td>
</td>
<td>Site Evaluation and Planning
During the design phase, property owners and designers should evaluate the topographic and hydrologic features of their site and minimize the amount of impervious surfaces. Soil characteristics determine whether the site is best suited for water capture or infiltration. Low impact development BMPs should be placed in locations that will maximize infiltration and minimize runoff.

Photo credit: Tom Liptan, Bureau of Engineering / Portland, OR</td>
</tr>
<tr>
<td></td>
<td>Retaining Existing Trees and Large Vegetation
Retaining existing trees and large vegetation that has well-developed root systems can help improve the infiltration capacity of a low impact development site.

Photo credit: Haan-Fawn Chau</td>
</tr>
<tr>
<td></td>
<td>Proper Site Grading
LID sites can be graded to enhance natural drainage patterns by directing water towards rain gardens and infiltration zones. Flat or shallow slopes reduce the velocity of stormwater runoff, allowing for greater infiltration. Moreover, carefully planned grading practices can help preserve valuable topsoil.

Photo credit: Haan-Fawn Chau</td>
</tr>
</table>

Preserving Top Soil and Preventing Soil Compaction
Healthy top soil can be a major asset to a LID site because it absorbs water quickly and the vegetation and microbes help filter out pollutants from urban runoff. Compaction can greatly reduce the infiltration capacity of soil. Therefore, strategies should be developed to preserve topsoil and to prevent soil compaction, especially during the construction phase of any LID project.

Photo: Compacted soil vs. healthy soil. Credit: Haan-Fawn Chau

Prioritizing LID Best Management Practices

Not all low impact development BMPs are equally effective, so municipalities could establish guidelines that place a greater priority on the installation of BMPs that fulfill goals for water infiltration, cleaning, velocity control, capture and reuse. On July 9, 2008 the City of Los Angeles adopted simple guidelines[10] to prioritize the installation of stormwater BMPs to fulfill the County's Standard Urban Stormwater Mitigation Plan (SUSMP). (Read more about SUSMP in Chapter 7.) The order of preference for the selection of appropriate BMPs is as follows: (1) infiltration systems, (2) biofiltration/retention systems, (3) stormwater capture and reuse, (4) mechanical/hydrodynamic units, and (5) a combination of any of the above.

In 2006, the County released a guidance manual called *Los Angeles County-Wide Structural BMP Prioritization Methodology*.[11] [12] The guidelines also apply to the City of Los Angeles because the City falls under the County's Standard Urban Stormwater Mitigation Plan. The County developed its Prioritization Methodology as a "systematic way of prioritizing structural BMP projects within Los Angeles County watersheds to optimize pollutant reductions in a cost-effective manner."[13] The County also notes that "the strength of the Methodology is its ability to systematically process multiple factors that affect BMP placement and effectiveness."[14]

Endnotes

[1] U.S. Environmental Protection Agency. "Storm Water Technology Fact Sheet-Vegetated Swales," September 1999. Accessed on 8/20/08, http://www.epa.gov/npdes/pubs/vegswale.pdf

[2] Fairfax County, VA. "Fairfax County – LID BMP Fact Sheet – February 28, 2005." Accessed November 2008, http://www.lowimpactdevelopment.org/ffxcty/1-4_bioswale_draft.pdf

[3] Idaho Department of Environmental Quality. "Stormwater: Catalog of Stormwater BMPs for Idaho Cities and Counties," Volume 3. Low Impact Development Techniques. September 2005. Accessed on 9/25/08, at http://www.deq.state.id.us/water/data_reports/storm_water/catalog/vol_3.pdf and http://www.deq.state.id.us/water/data_reports/storm_water/catalog/sec_3/text.pdf

[4] Connecticut River Joint Commission. "Introduction to Riparian Buffers for the Connecticut River Watershed," September 2000. Accessed on 8/25/08, www.crjc.org/buffers/Introduction.pdf

[5] "Greenroofs.com" internet-based news portal that promotes greenroofs. Accessed November 2008, www.greenroofs.com

[6] Pushard, Doug. *Rain Chains: The Art of Collecting Rainwater.* Accessed November 2008, http://www.harvesth2o.com/rainchain.shtml

[7] City of Los Angeles Bureau of Street Services, Street Maintenance Division. *Welcome to Street Maintenance Division.* Accessed November 2008, http://www.lacity.org/BOSS/StreetMaintenance/index.htm

[8] Cassidy, Arly, Josh Newell and Jennifer Wolch. "Transforming Alleys into Green Infrastructure for Los Angeles," June 2008. USC Center for Sustainable Cities. Accessed July 2008, http://college.usc.edu/geography/ESPE/documents/alleyreport_final_reduced.pdf

[9] CoolCommunities.org website. *Pervious Pavements for a More Livable Environment.* Accessed November 2008, http://www.coolcommunities.org/cool_pavements.htm

[10] City of Los Angeles Department of Public Works, Bureau of Sanitation. "City of Los Angeles – Standard Urban Stormwater Mitigation Plan (SUSMP) and Site Specific Mitigation Plan - Infiltration Requirement and Guidelines – Recommendation Report." Bureau of Sanitation Board Report No. 1. July 9, 2008. Accessed November 2008, http://eng.lacity.org/docs/dpw/agendas/2008%2F200807%2F20080709/san/20080709_ag_br_san_1.pdf

[11] Susilo, Ken J., Brandon Streets, Marc Leisenring, and Eric Strecker. County of Los Angeles Department of Public Works, Watershed Management Division. "Los Angeles County-Wide Structural BMP Prioritization Methodology: A Guidance Manual for Strategic Storm Water Quality Project Planning," 2006. Accessed on 1/15/09, http://ladpw.org/WMD/bmpmethod/assets/pdfdocs/guideancemanual.pdf

[12] County of Los Angeles Department of Public Works, Watershed Management Division. "Los Angeles County-Wide Methodology For Prioritizing Structural BMP Implementation: Guidance for Strategic Storm Water Quality Project Planning—Overview." Accessed on 1/15/09, http://ladpw.org/WMD/bmpmethod/overview.shtm

[13] Susilo, Ken J., Brandon Streets, Marc Leisenring, and Eric Strecker. County of Los Angeles Department of Public Works, Watershed Management Division. "Los Angeles County-Wide Structural BMP Prioritization Methodology: A Guidance Manual for Strategic Storm Water Quality Project Planning," 2006. Pg.7. Accessed on 1/15/09, http://ladpw.org/WMD/bmpmethod/assets/pdfdocs/guideancemanual.pdf

[14] County of Los Angeles Department of Public Works, Watershed Management Division. "Los Angeles County-Wide Methodology For Prioritizing Structural BMP Implementation: Guidance for Strategic Storm Water Quality Project Planning—Overview." Accessed on 1/15/09, http://ladpw.org/WMD/bmpmethod/overview.shtm

[4] Benefits of Low Impact Development

The potential benefits of low impact development for water pollution, water supply and energy usage in Los Angeles County are compelling. A study conducted by Community Conservancy International (CCI) in March 2008 found that **nearly 40% of L.A. County's needs for cleaning polluted runoff could be met by implementing low impact development (LID) projects on existing public lands.** CCI calculated that there is a net average of 15,000 acres of existing public lands in the county suitable for LID projects.[1]

Additionally, a study completed by the Natural Resources Defense Council (NRDC) in January 2009[2] found that an increased use of LID practices throughout residential and commercial properties in L.A. County would promote groundwater recharge and water capture and reuse, reducing the county's dependence on distant sources of water. This increased use of LID would result in the **savings of 74,600–152,500 acre-feet of imported water** per year by 2030. Based on current per capita water usage in the City of Los Angeles, this is equivalent to the water consumption of 456,300–929,700 people.[3] Moreover, since L.A. County would be pumping less water from distant locations, **131,700–428,000 MWH of energy would be saved** per year by 2030, which is equivalent to the electricity used by 20,000–64,800 households.[4] Therefore, LID could also mitigate climate change by reducing greenhouse gases.

Both the CCI and NRDC studies illustrate the significant benefits that broad implementation of low impact development strategies can have for the Los Angeles region. However, in order for Los Angeles to fully realize these benefits, LID would need to become a common, widespread practice for both new and existing land uses, not just an occasional innovation.

Quantifying LID Benefits

Quantifying the benefits of low impact development in monetary terms is dependent on the still-emerging field of placing economic

Major Benefits of LID for L.A. County

Polluted Urban Runoff

Nearly 40% of the county's needs for cleaning polluted runoff could be met by LID projects on existing public lands.[a]

Water Supply

By 2030, LID projects could save L.A. County 74,600–152,500 AF/yr of imported water through groundwater recharge and water capture & reuse.[b]

Energy Use & Climate Change

Greater reliance on local water supply instead of pumping from distant locations would save 131,700–428,000 MWH of energy per year by 2030.[c]

Additional LID Benefits

- Better flood control
- Reduced need for wastewater treatment
- Money saved on water management infrastructure
- Increased green space and wildlife habitat
- Reduced urban heat island effect
- Community beautification
- Emphasis on green jobs and economy

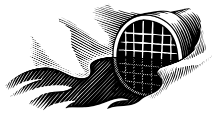
Sources: a) Community Conservancy International 2008, b) NRDC 2009, c) NRDC 2009 values on nature's services. While the initial efforts to determine environmental benefits may be challenging to undertake, recent studies specific to the Los Angeles area have made significant headway in providing data that can be used to calculate the benefits of LID projects. For instance, the Center for Urban Forest Research found that in Los Angeles, one million trees can remove 2.24 million pounds of air pollutants and capture 1.9 billion gallons of stormwater per year.[5] Also, the Los Angeles & San Gabriel Rivers Watershed Council has developed a Groundwater Augmentation Model that can estimate a low impact development BMP's potential for infiltration, water capture, and groundwater recharge.[6]

Low impact development is best known for helping to resolve stormwater issues, but will also have value in terms of reduction of the urban heat island effect, carbon sequestration, and groundwater recharge, as mentioned above. Further, unlike the typical mechanical methods of stormwater management (such as treatment plants) LID techniques often have significant and multiple community benefits that can simultaneously address a wide range of City concerns with one project. The following tables highlight some of the advantages that LID has to offer.

Flood Control & Wastewater Management

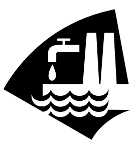
Issues	How LID Helps	Supporting Facts
• Heavy rains can cause flooding. "On a typical dry summer day, an average of about 24 million gallons per day (mgd) flows through the storm drain system into the Santa Monica Bay. In a heavy rain storm, this flow can increase to over one billion gallons per day."[7] • Stormwater often leaks into aging sewage pipes, straining the capacity of our treatment facilities. During a storm, the flow into the Hyperion Sewage Treatment Plant can double.[8] • The entire City of Los Angeles is approximately 47% impervious surfaces.[9]	• Reduces the quantity of urban runoff and prevents flooding. • Provides natural plants and soil which absorb excess stormwater. • Relieves pressure placed on sewage treatment plant during rain events because less stormwater seeps into the sewage system.	• Planted drainage swales in Seattle's "SEA Streets" project reduced runoff volume by 99%[10] and cost 25% less than conventional street designs.[11] • Simulated tests of curb bump-outs installed on Siskiyou Street in Portland, OR found that the vegetated swales absorbed enough water (85%) to prevent neighborhood basements from flooding.[12] • Rain gardens in Burnsville, MN retained 90% of storm runoff, even when rain was greater than the targeted 0.9-inch storm.[13]

RB-AR16438



River & Ocean Pollution

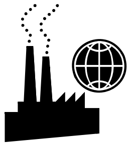
Issues	How LID Helps	Supporting Facts
• In Los Angeles, the primary source of pollution in oceans and rivers is urban runoff.[14] • The City's 34,000 catch basins carry trash and contaminants from the streets straight out to the ocean, with no treatment.[15] • Five of the 10 most polluted beaches in California are in L.A. County.[16]	• Stormwater retention basins and rainwater catchment systems reduce the volume of contaminated water headed for creeks, rivers and the ocean. • Biological filtration by plants and soils can remove pollutants and sediments from urban runoff.	• Nearly 40% of polluted runoff needs in L.A. County could be met by implementing "Green Solution" projects on existing public lands.[17] • In Seattle, a green street using a series of waterfall-like bioretention features captured up to 92% of pollutants through infiltration and plant uptake.[18] • Heritage Park in Minneapolis uses filtration basins and ponds to remove 70-80% of total phosphorous and 85% of sediment from local runoff.[19]



Water Supply & Demand

Issues	How LID Helps	Supporting Facts
• The L.A. area regularly faces water shortages and does not generate enough water to sustain itself. • Only 13% of L.A. City's water supply comes from local groundwater.[20] • 48% of L.A. City's water supply originates from the Mono Basin and Owens Valley aqueducts. • At least 30% of all the water used in the City of Los Angeles is used outdoors.[21]	• Decreases Los Angeles' dependence on outside sources of water. • Reduces the demand for irrigation water because rainwater is slowed and captured for infiltration into the ground. Some methods also capture water for reuse. • Increases the supply in the local water table. • Promotes or requires the use of drought-tolerant plants.	• Widespread use of water infiltration, capture and reuse in L.A. County would result in the savings of 74,600–152,500 acre-feet of imported water per year by 2030.[22] (Equivalent to the water consumption of 456,300–929,700 people.) • Each ¼-acre lot in L.A. has the potential to generate100,000 gallons of stormwater annually.[23] • By disconnecting 60,000 gutter downspouts, Portland diverted 1.5 billion gallons of stormwater per year. [24]

RB-AR16439

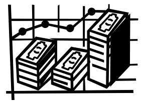


Climate Change

Issues	How LID Helps	Supporting Facts
• Fossil fuels are the #1 source of the greenhouse gases that cause climate change. • World temperatures could rise by between 2.0 and 11.5 °F during the 21st century.[25] • Blacktop surfaces can elevate surrounding city temperatures as much as 10°F.[26] • In the summer, central Los Angeles is typically 5°F warmer than surrounding suburban and rural areas due to the heat island effect.[27]	• Increasing the local water supply means that Los Angeles will use less energy pumping water from distant locations. • Trees and landscaping counteract climate change by absorbing excess carbon dioxide. • Shade from trees and evapotranspiration by plants reduce the heat island effect.	• Water systems account for 19% of the electricity used in the state of California.[28] • L.A. County could save 131,700–428,000 mWh of energy per year if less water was transported from Northern California.[29] (Equivalent to electricity use of 20,000–64,800 households.) • Each shade tree in L.A. prevents the combustion of 18kg of carbon annually and sequesters an additional 4.5–11kg of carbon per year.[30]

Green Space & Community Improvements

Issues	How LID Helps	Supporting Facts
• Los Angeles ranks last among major cities in per capita open space. The National Recreation and Parks Association recommends 10 acres of park space per 1,000 residents. L.A. barely reaches 10% of this national standard with a mere 1.107 acres per 1,000 residents.[31] • Many L.A. neighborhoods do not have any substantial trees or street landscaping. Acccording to a canopy analysis prepared for the City in 2006, L.A. has an average of only 21% canopy cover; in some districts, the canopy cover is as low as 7%.[32]	• Increases parks, open space and landscaping. • Complements the goals of the city's Million Trees LA Campaign. • Adds more wildlife habitat and enhances wetlands vegetation. • Many LID measures, such as increased landscaping, are aesthetically pleasing and help to beautify communities and make the city more pedestrian-friendly.	• L.A.'s Sepulveda Basin Wildlife Refuge is used to control major floods. It also provides 225 acres of wildlife habitat and recreation opportunities.[33] • Tree-lined streets are more walkable because they provide shade and some separation between cars and pedestrians.[34] • Attractive landscaping and plantings can increase property values by 15%.[35] • Trees and well-maintained grassy areas create a welcoming neighborhood atmosphere. Studies show this promotes social health and reduces crime and violent behavior.[36 37]



Green Jobs & Economy

Issues	How LID Helps	Supporting Facts
• The City of Los Angeles would like to encourage the development of "green-collar" jobs.[38] • The current economic recession has resulted in city budget cuts. More revenues are needed to fill the gaps.	• Encourages the growth of the green building industry. • Encourages the landscaping and gardening industry to shift to eco-friendly practices that emphasize native, drought-tolerant plants and rainwater harvesting. • Property drainage evaluations could increase the demand for "green industry" jobs in environmental assessment. • Trees and landscaping and reduced neighborhood flooding can enhance neighborhood property values, thus increasing tax revenues.	• L.A.'s Green Building Ordinance will create an anticipated 500 green-collar, union jobs.[39] • L.A.'s growing green building industry presents workforce development opportunities for auditors and landscapers and gardeners.[40] • Trees in Portland, OR generate approx. $13 million per year in property tax revenues by increasing real estate values.[41]

Construction & Building Costs

Issues	How LID Helps	Supporting Facts
• To maximize profits, developers usually select the most cost-efficient building and landscaping options. • To conserve funds, the City of L.A. makes it a priority to keep construction costs low for City projects.	• LID projects use less concrete & asphalt, and reduce the need for pipes and other stormwater control devices. As a result, site development and maintenance costs can be lowered. [42] • LID best management practices can eliminate the need for expensive curbs and gutters (catch basins). [43] • LID projects involve minimal clearing and grading, thus reducing the need for costly earth-moving equipment. [44]	• An EPA analysis of 17 LID projects from across the nation found that all but a few projects cost less than conventional water management controls. Savings ranged from 15–80%.[45] • Seattle's first green street (SEA Street #1) cost 25% less than conventional street designs. [46] • Extensive use of swales and rain gardens for a new subdivision in Somerset, MD cost 32% less than it would have for conventional stormwater controls.[47]

Endnotes

[1] Community Conservancy International. "The Green Solutions Project" report, March 2008. Executive Summary, p.ES-3. The report can be viewed at http://www.ccint.org/greensolution.html

[2] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices—Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[3] This calculation is based on the average daily per capita water use of Los Angeles residents from 2006-2007, which was 146 gallons per person per day. (According to the City of Los Angeles Department of Environmental Affairs website, http://www.lacity.org/EAD/2007environmental%20facts.htm, accessed on 2/22/09.) 146 gallons per day x 365 days per year = 53,290 gallons per person per year = .1635 AF/person/year. Conversion factor: 1 acre foot = 325,851 gallons. 74,600 AF per year saved / .1635 AF per person per year = the water used by 456,269 people. 152,000 AF per year saved / .1635 AF per person per year = the water used by 929,664 people.

[4] This calculation is based on the average monthly electricity use per household in the City of Los Angeles, which is 550 kWh. (According to the C40 Cities website, http://www.c40cities.org/bestpractices/renewables/la_renewable.jsp, accessed on 2/22/09.) 550 kWh per household per month x 12 months = 6,600 kWh = 6.6 mWh per household per year. 131,700 mWh saved per year / 6.6 mWh per household per year = 19,955 households per year. 428,000 mWh saved per year / 6.6 mWh per household per year = 64,848 households per year.

[5] City of Los Angeles, Million Trees LA program. *Why Get Involved?* Accessed on 4/1/09, http://www.milliontreesla.org/mtabout6.htm

[6] Information provided by Nancy Steele, Executive Director, Los Angeles & San Gabriel Rivers Watershed Council in an email message on February 10, 2009. Further information can be found at www.lasgrwc.org/WAS.htm

[7] City of Los Angeles Department of Public Works, Stormwater Program. *Stormwater Frequently Asked Questions.* Accessed on 8/25/08, http://www.lacity.org/SAN/wpd/Siteorg/residents/faqs.htm

[8] City of Los Angeles Department of Public Works, Stormwater Program. *City of Los Angeles Hyperion Sewage Treatment Plant.* Accessed on 10/3/08, http://www.lacity.org/SAN/Wpd/Siteorg/general/hypern1.htm

[9] Estimate calculated by the City of Los Angeles Department of Public Works, Bureau of Sanitation. The land use data was developed by the Southern California Association of Governments in 2005. Information obtained from an email message to Paula Daniels, Commissioner, Board of Public Works, sent by Shahram Kharaghani, Environmental Engineer, Bureau of Sanitation on January 29, 2009.

[10] Seattle Public Utilities Commission. *Street Edge Alternatives (SEA Streets) Project.* Accessed 12/31/08, http://www.seattle.gov/UTIL/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

[11] Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning,* the magazine of the American Planning Association. August/September 2008. Pages 14-19.

[12] ibid.
[13] ibid.

[14] Heal the Bay. Online News: *L.A. County Takes a Major Leap in Protecting Water Quality,* October 10, 2008. Accessed on 1/5/09, http://www.healthebay.org/news/2008/10-07_LACounty-LID/default.asp

[15] City of Los Angeles Department of Public Works, Stormwater Program. *What is Stormwater Pollution?* Accessed on 10/3/08, http://www.lastormwater.org/Siteorg/residents/whatis.htm

[16] Heal the Bay. "2007-2008 Annual Beach Report Card." Accessed on 10/3/08. http://www.healthebay.org/assets/pdfdocs/brc/annual/2008/execsumm.pdf

[17] Community Conservancy International. "The Green Solutions Project" report, March 2008. Executive Summary, p.ES-3. The report can be viewed at http://www.ccint.org/greensolution.html

[18] Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning,* the magazine of the American Planning Association. August/September 2008. Pages 14-19.

[19] ibid.

[20] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices—Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[21] Los Angeles Department of Water & Power. "City of Los Angeles Water Supply Action Plan," p.4. May 2008.

[22] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices—Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[23] Estimates of potential stormwater runoff assuming an average yearly rainfall in Los Angeles of 15-inches on impervious surfaces. {Potential stormwater from a ¼-acre lot} = (0.25 x 43,560 sq.ft. per acre) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 101,835 gallons. An ordinary, 2-lane street is 30 feet wide. {Potential stormwater from a city street, not including sidewalks} = (500 ft. long) x (30 ft. wide) x (15" rain per year) / (12" per ft.) x (7.481 gal. per cu.ft.) = 140,269 gallons. Calculation by the City of Los Angeles Bureau of Sanitation, November 2008.

[24] Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning,* the magazine of the American Planning Association. August/September 2008. Pages 14-19.

[25] Intergovernmental Panel on Climate Change. "Climate Change 2007: Synthesis Report. Summary for Policy Makers." IPCC Fourth Assesment Report (AR4); Summary for Policy Makers. Accessed on 1/2/09, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

[26] Brasuell, James. *TreePeople Advocates for Practical and Holistic Solutions to Los Angeles' Environmental Crisis,* interview with Andy Lipkis. VerdeXchange News, Vol. 01: No. 03: June 2007. Accessed on 1/10/09, http://www.verdexchange.org/node/87

[27] Rosenfeld, Arthur H, Joseph J. Romm, Hashem Akbari, and Alan C. Lloyd. *"Painting the Town White—and Green."* Originally published in the February/March 1997 issue of MIT's Technology Review. Accessed on 1/5/09 from the Heat Island Group website: http://heatisland.lbl.gov/PUBS/PAINTING/

[28] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices—Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[29] ibid.

[30] Akbari, H. "Shade Trees Reduce Building Energy Use and CO_2 Emissions From Power Plants." *Environmental Pollution* 116 (2002) S119–S126. Accessed on 1/4/09, http://www.fs.fed.us/psw/programs/cufr/products/12/psw_cufr703_Akbari_Reduce_Energy_Use.pdf

[31] The Los Angeles Neighborhood Land Trust. *Why LANLT: Overview.* Accessed on 1/7/09, http://www.lanlt.org/

[32] E. Gregory McPherson, Center for Urban Forest Research, US Forest Service, Davis, CA; and J. R. Simpson, Q. Xiao, and C. Wu. "Million Trees LA Canopy Cover Assessment." Accesed on 4/1/09, http://ams.confex.com/ams/7Coastal7Urban/techprogram/paper_126994.htm

[33] City of Los Angeles Department of Recreation and Parks. *Sepulveda Basin Wildlife Reserve.* Accessed on 1/6/09, http://www.laparks.org/dos/horticulture/sepulvedabasin.htm

[34] Traffic Safety Center. *Can Pedestrian-friendly Planning Encourage Us to Walk?* Online newsletter Volume 2, Number 1, Spring 2004. Accessed on 1/9/09, http://www.tsc.berkeley.edu/newsletter/Spring04/planning.html

[35] Lerner, Joel M. "A Property's Value Can Grow on Its Trees," *Washington Post* Saturday, September 23, 2006; Page F26. Accessed on 1/9/09, http://www.washingtonpost.com/wp-dyn/content/article/2006/09/21/AR2006092102046.html

[36] Kuo, Frances E. "The Role of Arboriculture in a Healthy Social Ecology." *Journal of Arboriculture* 29(3): May 2003. Accessed on 1/6/09, http://treelink.org/joa/2003/may/04Kuo.pdf

[37] Kuo, Frances E. "Environment and Crime in the Inner City: Does Vegetation Reduce Crime?" *Environment and Behavior,* Vol. 33, No. 3, 343-367 (2001). Accessed on 1/6/09 at http://eab.sagepub.com/cgi/reprint/33/3/343

[38] City of Los Angeles, Office of Mayor Antonio Villaraigosa. *Energy & Environment: Green LA.* Accessed on 2/3/09, http://mayor.lacity.org/villaraigosaplan/EnergyandEnvironment/LACITY_004467.htm

[39] Schmitz, Rob. *L.A. considers green building codes.* November 28, 2008. Accessed on 1/7/09 from the American Public Media: Marketplace website: http://marketplace.publicradio.org/display/web/2008/11/28/green_jobs/

[40] Rosner, Signalle. "Job Implications in Los Angeles' Green Building Sector," May 2006. Accessed on 1/7/09 from the Green for All website: http://www.greenforall.org/resources/job-implications-in-los-angeles-green-building

[41] USDA Forest Service, Pacific Northwest Research Station. *Study shows that street trees increase the value of Portland homes by more than $1 billion,* March 10, 2008. Accessed on 1/3/09, http://www.fs.fed.us/pnw/news/2008/03/trees.shtml

[42] U.S. Environmental Protection Agency. *Questions and Answers: Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices.* From the Polluted Runoff (Nonpoint Source Pollution) web page. Accessed on 2/1/09, http://www.epa.gov/owow/nps/lid/costs07/q-and-a.html

[43] ibid.
[44] ibid.

[45] U.S. Environmental Protection Agency. *Fact Sheet: Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007. From the Polluted Runoff (Nonpoint Source Pollution) web page. Accessed on 1/3/09, http://www.epa.gov/owow/nps/lid/costs07/factsheet.html

[46] Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning,* the magazine of the American Planning Association. August/September 2008. Pages 14-19.

[47] U.S. Environmental Protection Agency, Nonpoint Source Control Branch (4503T). "Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices," December 2007. EPA Document #EPA 841-F-07-006. Accessed on 1/3/09, http://www.epa.gov/owow/nps/lid/costs07/documents/reducingstormwatercosts.pdf

[5] Examples of LID Programs & Projects

Many cities across the country already have low impact development (LID) regulations, programs and projects underway, often pursued as an extension of a greater stormwater management, landscaping or sustainability program. This chapter describes a variety of LID efforts in the United States, with some specific focuses on local examples from Los Angeles and Southern California. This review is intended to be selective and not exhaustive. For more information on nationwide LID practices, please see the resources listed in Appendix I.

Maryland— LID Programs and Stormwater Regulations

Prince George's County: LID Urban Retrofit Program

In 1999, the Environmental Services Division of Prince George's County, Maryland, pioneered a radically different approach to stormwater management with the introduction of their manual titled, "Low Impact Development Design Strategies: An Integrated Design Approach."[1] This document has since become a leading reference guide on low impact development in the United States. By the end of 2006, Prince George's County had completed a number of projects to demonstrate the feasibility of incorporating LID principles into the urban landscape.

Highway divider strip before and after the retrofit of an infiltration swale.

Credit: Final Technical Report – Pilot Projects for LID Urban Retrofit Program in the Anacostia River

The pilot projects in the Anacostia River Watershed focused on infiltration and bio-retention BMPs to manage urban runoff, while keeping an eye on the overall landscaping aesthetics.[2] These projects incorporate key LID elements: conservation of existing natural and topographical features, emphasis on retrofitting as opposed to clearing new land, increased detention times over existing conditions, and the integration of small source-control projects into existing landscaping to improve local water quality.

Maryland Stormwater Act of 2007

Governor Martin O'Malley signed the Maryland Stormwater Act into law in 2007.[3] This act aims to maintain predevelopment runoff characteristics as nearly as possible by implementing "environmental site design" (ESD). ESD includes the conservation of natural features, minimizing use of impervious surfaces, slowing runoff, and preferentially using nonstructural practices or innovative stormwater management practices. Because of the Stormwater Act, the Maryland Stormwater Design Manual (originally released in 2000) has been revised to promote ESD as much as possible.[4]

RB-AR16445

Seattle— SEA Streets and Green Factor

SEA Streets Project

In 2001, Seattle completed its pilot "Street Edge Alternatives" Project (SEA Streets).[5] The city redesigned residential streets to reflect natural drainage patterns using swales and the addition of over 100 evergreen trees and 1100 shrubs. To support LID goals, the SEA Streets had 11% less impervious surfaces than a conventional street. Two years of monitoring has found that the SEA Streets have reduced the total volume of stormwater leaving the street by 99%.

Seattle's SEA Street (Street Edge Alternatives) project includes bioswales and permeable pavement.

Seattle Green Factor

In 2006, the City of Seattle revised its building codes for business and commercial areas. A part of the revision included an innovative system called the Seattle Green Factor, which places an environmental value on virtually every exterior element of a property.[6] The Seattle Green Factor promotes LID principles using flexible requirements, which allows developers to select the most appropriate landscaping and building elements for their site. The Green Factor aims to increase the quantity and quality of natural drainage and landscaping elements. While layering vegetation and public visibility are prominent objectives, the Green Factor also promotes rainwater harvesting and the use of plants with low water requirements.

Seattle Green Factor Scoring Parameters

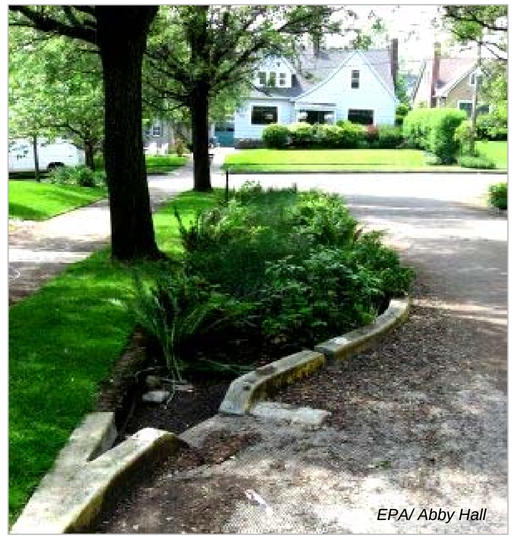
Element	Multiplier
Vegetated walls	0.7
Rain garden	0.7
Lawn – deep	0.7
Green roofs	0.7
Permeable pavement	0.6
Exceptional trees	0.5
Bigger trees	0.4
Smaller trees	0.3
Shrubs-deep	0.3
Shrubs – shallow	0.3
Lawn – shallow	0.2
Visibility (aesthetics) - bonus	0.1
Drought tolerant - bonus	0.1
Conventional pavement	0.0

As of January 2007, Seattle requires new developments in neighborhood business districts to achieve a final Green Factor score of 0.30 or higher. A "Green Factor Worksheet" lists various landscaping options along with their corresponding multipliers. The multipliers, which weigh the elements in proportion to their desirability and environmental effectiveness, are used with square footage measurements to calculate the total Green Factor value of a property. For example, asphalt, concrete and conventional pavement have low green factors of 0.0, but LID practices such as permeable paving (0.6) and green roofs (0.7) have much higher values.

RB-AR16446

Portland— Green Street Retrofits & Stormwater Management Program

Siskiyou Green Street Project



Curb bump-outs on NE Siskiyou Street in Portland, OR.

Portland, Oregon's first green street project on NE Siskiyou Street was completed in just two weeks during 2003.[7] Siskiyou Street was selected for the pilot project because the local homes would experience basement flooding during major storms.[8] Two stormwater curb extensions ("bump-outs") with attractive landscaping were added to this residential street for $17,000.[9] Strategically-placed curb cuts in the bump-outs allow street runoff to flow into the bioswales, where the water is then filtered and infiltrated into the ground. A flow test conducted in 2004 determined that the bump-outs would capture 85% of the runoff generated by a 25-year storm and delay the peak flow by twenty minutes.[10] Besides the major stormwater management benefits, the Siskiyou Street project also makes the street more attractive, filters out water pollutants and increases street safety by reducing the speed of cars.

Portland's Stormwater Management Manual

The City of Portland has a comprehensive approach to stormwater management that emphasizes the use of vegetated surfaces to treat and infiltrate stormwater on the property where the stormwater runoff originates. The Stormwater Management Manual (SWMM), developed by the Portland Bureau of Environmental Services in 1999 and most recently revised in July 2008, outlines the stormwater management requirements that apply to development and redevelopment on private and public properties.[11] The SWMM illustrates methods for infiltration and discharge, flow control, pollution reduction, operations and maintenance, and source control. The city promotes the use of vegetated surface infiltration facilities for meeting multiple requirements. SWMM provides design criteria for these vegetated facilities, many of which are LID-based.

Portland's Office for Sustainable Development also provides guidelines and practical solutions for designing and building of LID practices such as eco-roofs, rainwater harvesting, green streets, and water conservation.[12] This office uses a combination of technical assistance (including workshops for homeowners and businesses), outreach, research and policy development.

Chicago— Green Infrastructure

Water Agenda & Green Building Agenda

Chicago's green roof on City Hall

Photo: http://www.asla.org/meetings/awards/awds02/chicagocityhall.html

The City of Chicago published its "Water Agenda" in 2003 as a strategy for protecting its water resources by conserving water, protecting water quality, managing stormwater and providing outreach and encouraging mobilization—all focusing on "green" infrastructure as opposed to conventional "built" infrastructure.[13] The stormwater component of this plan relies on creating green infrastructure for City projects as well as private developments. Examples of low impact development (LID) practices include rooftop gardens, permeable alleys, rain gardens, green design and infrastructure requirements for developers' site plans, and wetlands rehabilitation. Building on experience, Chicago started a new green building program, "Chicago's Green Building Agenda 2005," with goals that include reduced operation and maintenance costs, conservation of natural resources, and the improvement of health and productivity. Ultimately, Chicago expects to create a "Green Building Code" to utilize green building technologies and strategies.

Green Alley Program

Chicago's "Green Alley" program, developed by their Department of Transportation, has completed projects that use permeable pavement to increase rainwater infiltration, recycled concrete, and surfaces that have a high solar reflectance (high albedo) to reduce the heat island effect.[14] "The Chicago Green Alley Handbook"[15] recently won the 2007 American Society of Landscape Architects award for Communications Honors[16] for its simple and easy-to-understand graphics explaining possible BMPs. Other cities (including Seattle, Baltimore and Vancouver) also have innovative programs to convert, sometimes unattractive, alleys into green spaces and stormwater BMPs.

Permeable alley during construction and after completion in Chicago.

Credit: Chicago Dept. of Transportation

Stormwater Ordinance and BMP Guide

The Chicago Stormwater Management Ordinance, effective January 1, 2008, specifically addresses many of the goals of the Water Agenda.[17] The ordinance requires "regulated development" to have an approved stormwater management plan in place for (1) managing the peak rate of stormwater discharge from the property, and (2) controlling *on site* (by capture) the volume generated by ½ inch of stormwater on the property's impervious surfaces.

The City of Chicago has also developed the "Guide to Stormwater Best Management Practices," which is a "how to" plan for residents, developers, and other community members on several LID BMPs for reducing the amount of stormwater.[18] The guide includes cost estimates and is a helpful resource for more information.

City of Ventura— Green Streets Policy & LID Resolution

In July 2008, the City of Ventura enacted its "Green Street" policy, which directed city staff to "begin incorporating Green Street elements into repaving projects on a city-wide basis," and identified South Catalina Street as the location for a Green Infrastructure Demonstration Project.[19] The projects all incorporate LID practices, and range from street and alley repaving projects to a requirement that all City parking lots include provisions to divert and retain stormwater runoff. To help plan future projects, the City developed a comprehensive "Green Streets Matrix" which contains BMP benefits and costs. *(See Appendix II.)*

City of Ventura, California
Credit: "Solving the Urban Runoff Problem" www.surfrider.org/ventura

At the same time, the Ventura City Council adopted a resolution in support of the "Resolution of the California Ocean Protection Council Regarding Low Impact Development."[20] The resolution, drafted by the Ocean Protection Council, aims to coordinate and improve the protection and management of California's ocean and coastal resources by implementing the Governor's Ocean Action Plan. The resolution states that LID is a "practicable and superior approach to minimize and mitigate increases in runoff and runoff pollutants" at a cost that is 15% to 80% less than when using conventional stormwater treatment facilities. Accordingly, the resolution promotes the use of LID principles for new developments and redevelopments and LID retrofits of existing impervious areas. It also describes a series of recommendations for the implementation of LID at the state and local level, which Ventura seeks to incorporate.

County of Los Angeles— Green Building Ordinances

In October 2008, the County of Los Angeles passed a comprehensive Green Building Program supported by three ordinances: 1) Green Building Ordinance, 2) Drought-Tolerant Landscaping Ordinance, and 3)

Low Impact Development Ordinance.[21] The Green Building Program ordinances apply to the unincorporated portions of Los Angeles County, as well as to all County of Los Angeles capital construction projects.[22] Draft versions of the "Low Impact Development Manual" and the "Green Building and Sustainability Guidelines" have been created.

The **Green Building Ordinance** will apply only to new construction. Buildings, no matter their size, will have to comply with the County's green building standards.[23] Larger residential, mixed use, hotel and high-rise buildings will also have to become LEED certified by the U.S. Green Building Council. The County's Green Building Standards support LID principles by requiring smart irrigation controllers and drought-tolerant plants (selected from a list of approved species) for at least 75% of the total landscaped area. Residential projects are also required to plant a specified number of drought-tolerant trees.

1100 S. Hope Street in downtown Los Angeles

The County's **Drought-Tolerant Landscaping Ordinance** amends Titles 21 and 22 of the Los Angeles County Code by establishing minimum standards for the design and installation of landscaping using drought-tolerant plants. This ordinance will apply to all construction of new private property as well as to expansions of existing buildings or structures in excess of 2,500 square feet; the ordinance requires that at least 70% of the landscaped area shall use plants from the "Drought-Tolerant Approved Plant List" maintained by Los Angeles County Department of Regional Planning.

The objectives of the **Low Impact Development Ordinance** include:[24]

a) Mimic the stormwater and urban runoff rates and volumes that would be found in an undeveloped area in any storm event up to and including the 50-year capital design storm[a] event;[25]
b) Prevent stormwater pollutants of concern from flowing off-site (for storms up to and including the water quality design storm event); and
c) Minimize impacts to natural drainage systems.

The County's LID Ordinance will apply to new development and redevelopments. Redevelopment projects that alter more than half of a site's impervious surfaces must bring the entire site up to LID standards. Otherwise, only the alteration itself needs to meet LID requirements. Projects that 1) alter less than 50% of impervious surfaces, and 2) have no more than four previously existing residential units are exempt from LID standards.[26]

[a] "Capital storm" is a 50-year design storm on a saturated watershed.

City of Los Angeles— River Master Plan and Green Streets

Los Angeles River Revitalization Master Plan

The **Los Angeles River Revitalization Master Plan** (LARRMP), published in April 2007, is a 20-year blueprint for the development and management of the first 32 miles of the river, from Canoga Park to downtown.[27] The goals of this plan are to restore the ecological and hydrological functions of L.A. River, to green adjacent neighborhoods, to capture community opportunities, and to create value for the local area. The plan recommends the transformation of the River Corridor into to a continuous River Greenway. Typical LID elements in the LARRMP include the implementation of greens streets and natural open spaces, daylighting of streams currently hidden by development, and the incorporation of stormwater BMPs into existing roadways, new streetscapes, and in all public landscapes.

Recent photo, San Fernando Valley

Revitalization Concept

Photo Credit: http://www.lariverrmp.org/CommunityOutreach/masterplan_download.htm.

Green Streets L.A. Program

Contaminated runoff is the largest source of ocean pollution in Southern California,[28][29] and the city's street infrastructure plays a major role in flushing these pollutants out to sea. The city has approximately 6,500 miles of streets[30] with 10,000 miles of sidewalk[31] and 34,000 catch basins.[32] The **Green Streets LA** program[33] was initiated by the Board of Public Works with the idea that the streets of Los Angeles offer an enormous opportunity to infiltrate, capture and filter urban runoff to prevent pollution and to convert stormwater into a valuable resource for groundwater recharge and water reuse.[34]

The **Green Streets Committee** is comprised of representatives from a number of City departments that work on issues related to street infrastructure. Monthly meetings are designed to help facilitate communication and coordination between these entities. Recently, the Green Streets Committee has focused on integrating LID practices into City infrastructure programs and construction standards. A preliminary set of Green Streets design guidelines were developed in 2008.

The **Green Alleys Committee** (a subcommittee of the Green Streets Committee) is working on identifying alleys in Los Angeles that could become pilot projects for a green retrofit. There is a total of 914 linear miles of alleys within the City of Los Angeles.[35] The committee is also investigating funding opportunities. The main representatives on the Green Alleys Committee come from the Board of Public Works, the Community Redevelopment Agency and the USC Center for Sustainable Cities Program (CSC). The CSC has developed detailed characteristics on over 300 alleys in Los Angeles.[36]

Green Streets Projects in Los Angeles

Oros Street is a residential street in the Elysian Valley section of Los Angeles. Runoff from this street drains directly to Los Angeles River. This is one of the first streets in Los Angeles to be converted into a green street. Completed in 2007 at a total cost of about $1 million, this project provides bio-retention areas in the street parkway, additional street landscaping and a large infiltration basin underneath Steelhead Park at the end of the block. The objective was to capture and treat 100% of the dry-weather runoff and at least ¾" of rainfall during storms. This project was a collaboration between North East Trees and the City of Los Angeles, represented by the Bureau of Street Services and the Watershed Protection Division from the Bureau of Sanitation.

Oros Street during and after "green street" reconstruction.

Riverdale Avenue is close to Oros Street and is expected to be converted to a green street by the end of 2009. The purpose of the retrofit is to capture and infiltrate urban runoff and stormwater from a 14.6-acre drainage area by using specially-designed diversion measures and infiltration planters. Existing parkways and sidewalks will be replaced by native plant species. Construction costs of this project are funded by a grant from the State Coastal Conservancy (up to $500,000) and the City of Los Angeles will provide in-kind design services.

Current view of Riverdale Ave. (left) and design concept for Riverdale green street retrofit (right).
Credit: LABOS / D. Deets

Elmer Avenue, between Stagg and Keswick Street in the Sun Valley watershed, will be retrofitted into a green street by the summer of 2009. The focus of this retrofit is to minimize the water demand for irrigation and to improve the quality of runoff that flows into L.A. River.[37] Project elements include runoff capture and infiltration on the public right-of-way and runoff capture and water conservation on residential properties (rain gardens, drought-tolerant landscaping, permeable surfaces). This project is a collaboration between residents, nonprofit organizations, granting agencies, Council District 6, and the Bureaus of Sanitation, Street Services and Engineering.[38] The Los Angeles and San Gabriel Rivers Watershed Council has agreed to provide a grant of $1.25 million. TreePeople will also provide educational and financial assistance to residents for converting their lawns to native landscaping and for using stormwater BMPs. This project is part of the L.A. Basin Water Augmentation Study led by the San Gabriel Rivers Watershed Council.[39]

Bimini Slough Ecology Park, near Second and Vermont Avenues in the Koreatown section of Los Angeles, is a new pocket park built on LID principles. Existing, well-established trees were incorporated into the park's redesign. New plants and trees were selected from native, drought-tolerant varieties. In the dry season, plants are maintained with a state-of-the-art drip irrigation system. The Bimini Slough Ecology Park incorporates a biofiltration swale to reuse stormwater.[40] A decomposed granite walkway allows for infiltration. Los Angeles County oversaw testing[41] to evaluate BMP performance, which indicated that the biofiltration swale effectively reduced total suspended solids, oil and grease and had some impact on reducing other constituents of concern.[b] The park opened to the public on January 26, 2006.

---

[b] Testing was completed in 2005 and was limited to three sampling events in a particular wet year. Because the testing was very limited, meaningful performance statistics were not generated. However, test results seem to indicate effective performance at reducing oil and grease and Total Suspended Solids. Though not as conclusive, data also appeared to indicate reductions in lead and zinc. Analysis of samples for microorganisms and nutrients were not conclusive other than to indicate there was not a significant change, inlet to outlet.

2005 View of 2nd street before park construction.
Credit: LABOS

Bimini Slough Ecological Park in East Hollywood by after plants became well established.
Credit: North East Trees

Los Angeles Downspout Disconnection Program

The City of Los Angeles initiated a pilot "Downspout Disconnection" program in December 2008 to prevent roof runoff from homes and businesses in the Ballona Creek watershed area from flowing onto into the storm drain system.[42] [43] Instead, the City will offer incentives and educational information to encourage citizens to redirect the water from their downspouts away from impervious surfaces and into planters or rain barrels for later reuse.

Santa Monica— Green Building Program

The City of Santa Monica's Green Building Ordinance[44] is a component of its Green Building Program, which also includes construction guidelines, identifies green building materials, and establishes landscaping and irrigation requirements.[45] The Green Building Program provides incentives in the form of grants—ranging from $20,000 to $35,000—for the design of buildings certified under the U.S. Building Council's LEED Green Building Rating System. Another element of the City's program provides expedited permitting for LEED-registered projects.

A Santa Monica home that collects roof runoff in a rain barrel.

Santa Monica has also published the "Santa Monica Residential Green Building Guide" that describes sustainable building practices that can be incorporated into new or remodel construction.[46] The guide explains the benefits of using environmentally-friendly alternatives for utilities, construction materials and landscaping. The guide includes extensive resources for products, technical guidance and financial resources such as grants.

City of San Diego— Stormwater Management & LID Program

The City of San Diego created the "Low Impact Development Handbook: Stormwater Management Strategies" in December 2007, in part, to satisfy the City's Municipal Stormwater Permit. The city's LID program protects water quality by preserving or mimicking nature through the use of stormwater planning and management techniques. The handbook provides a list of LID planning and stormwater management strategies for developers, builders, contractors, planners, landscape architects, engineers, and government employees to help in planning a new project site.[47] Eventually, all sites larger than one acre in the City of San Diego will be required to incorporate LID features. Though the handbook is now just a guide, many of the techniques will eventually be incorporated into the city's SUSMP (Standard Urban Stormwater Mitigation Plan) requirements.

Northern California

Village Homes in Davis, CA

Village Homes is a well-established community and housing development in Davis, CA that was built around LID concepts. It is located in a climate similar to many parts of Los Angeles—warm summers, cool winters and limited rainfall (approximately 25% more than Los Angeles).[48] Developed in 1970s and early 1980s, Village Homes is an excellent example of residential low impact development. There are 225 homes and 20 apartments on 70 acres, and the entire development relies exclusively on a natural drainage system—creek beds, swales, and pond areas. The development is well known for these unique landscape design features. Village Homes also incorporates many other environmental features such as narrow streets, passive heating and cooling, and organic gardening practices.

Village Homes relies exclusively on natural drainage.
Photo credit: http://www.villagehomesdavis.org

Emeryville— Guidelines for Green Development

The City of Emeryville, CA released "Stormwater Guidelines for Green, Dense Redevelopment" in December 2005. It is a guide to integrating high density live/work communities, parking and ecological benefits.[49] It recommends land use and parking policies that minimize impervious surfaces and maximize green space for recreation, improved water quality, reduced heat-island effects and community aesthetics. The

Stacking cars reduces the need for impervious parking lots at this business in Emeryville.

guide comes with a companion spreadsheet model to evaluate various combinations of LID concepts, including detention systems, infiltration and flow-through planters and biofiltration swales. This simple model makes it easy to evaluate different storm scenarios for Emeryville, and could probably be adapted for use in other regions.

San Francisco— Rainwater Harvesting Program

The San Francisco Public Utilities Commission (SFPUC) began its rainwater harvesting program in October 2008. Its main goal is to reduce the amount of water flowing into the municipal combined sewer system, but it also promotes the use of rainwater for irrigation and non-potable applications.[50] The SFPUC is subsidizing the cost of rain barrels for city residents and not requiring permits for their use. The same program is also promoting the use of cisterns on larger properties.

Endnotes

[1] Prince George's County (MD) Department of Environmental Resource Programs and Planning Division. "Low-Impact Development Design Strategies An Integrated Design Approach," June 1999. Accessed 8/15/08, http://www.lowimpactdevelopment.org/pubs/LID_National_Manual.pdf

[2] Prince George's County (MD) Department of Environmental Resources. "Final Technical Report: Pilot Projects for LID Urban Retrofit Program in the Anacostia River Watershed, Phase III," December 30, 2006. Accessed 8/15/08, http://www.co.pg.md.us/Government/AgencyIndex/DER/ESG/pdf/Final%20Technical%20Report_Phase%20III.pdf

[3] State of Maryland Department of the Environment. *Maryland Stormwater Mangement Act of 2007.* Accessed 10/2/08, http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/swm2007.asp

[4] State of Maryland Department of the Environment. *Maryland Stormwater Design Manual—Volumes I & II,* effective October 2000. Accessed 10/2/08, http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

[5] Seattle Public Utilities Commission. *Street Edge Alternatives (SEA Streets) Project.* Accessed 12/31/08, http://www.seattle.gov/UTIL/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

[6] City of Seattle (WA) Department of Planning & Development. *Seattle Green Factor: What is the Seattle Green Factor?* Accessed November 2008, http://seattle.gov/dpd/permits/greenfactor/Overview/

[7] City of Portland (OR) Bureau of Environmental Services. "NE Siskiyou Green Street Project: Project Summary," April 2005. Accessed on 1/2/08 at http://www.portlandonline.com/bes/index.cfm?a=78299&c=45386

[8] City of Portland (OR) Bureau of Environmental Services. "Flow Test Report: Siskiyou Curb Extension, August 4th 2004." Accessed on 1/2/08, http://www.portlandonline.com/shared/cfm/image.cfm?id=63097

[9] City of Portland (OR) Bureau of Environmental Services. "NE Siskiyou Green Street Project: Project Summary," April 2005. Accessed on 1/2/08, http://www.portlandonline.com/bes/index.cfm?a=78299&c=45386

[10] City of Portland (OR) Bureau of Environmental Services. "Flow Test Report: Siskiyou Curb Extension, August 4th 2004." Accessed on 1/2/08, http://www.portlandonline.com/shared/cfm/image.cfm?id=63097

[11] City of Portland (OR) Bureau of Environmental Services. "City of Portland Stormwater Management Manual," Revision 4, July 1, 2008. Accessed 10/2/08, http://www.portlandonline.com/bes/index.cfm?c=47952&

[12] City of Portland (OR) Bureau of Planning and Sustainability. *Stormwater Management.* Accessed on 10/1/08, http://www.portlandonline.com/osd/index.cfm?c=42113

[13] City of Chicago (IL). "Chicago's Water Agenda 2003." Accessed on 10/1/08, http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/wateragenda_1.pdf

[14] City of Chicago, Department of Transportation. *Green Alleys.* Accessed October 2008, http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?BV_SessionID=@@@@1030171822.1233726916@@@@&BV_EngineID=cccdadeggjimimjcefecelldffhdfhm.0&contentOID=536946345&contenTypeName=COC_EDITORIAL&topChannelName=Dept&blockName=Transportation%2FGreen+Alleys%2FI+Want+To&context=dept&channelId=0&programId=0&entityName=Transportation&deptMainCategoryOID=-536883915

[15] City of Chicago (IL). "The Chicago Green Alley Handbook." Accessed on 10/1/08, http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenAlleyHandbook.pdf

[16] American Society of Landscape Architects, Illinois Chapter. *2007 Awards.* Accessed on 10/1/08, http://www.il-asla.org/awards_2007.html

[17] City of Chicago (IL). Chicago Stormwater Management Ordinance, "Substitute Ordinance." Accessed on 10/1/08, http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/StormwaterManagementOrdinance1206.pdf

[18] City of Chicago (IL). "A Guide to Stormwater Best Management Practices: Chicago's Water Agenda," 2003. Accessed on 10/1/08, http://egov.cityofchicago.org/webportal/COCWebPortal/COC_ATTACH/GuideToStormwaterBMPs.pdf

[19] City of Ventura (CA). "Administrative Report," written by Rick Cole, City Manager, to Ronald J. Calkins, Public Works Director on July 7, 2008. Council action date: July 14, 2008. Agenda item #13.

[20] California Ocean Protection Council. *Announcements.* Accessed on 10/2/08, http://resources.ca.gov/copc/

[21] County of Los Angeles. "Ordinances for Green Building, Low Impact Development and Drought-Tolerant Landscaping," November 14, 2008. Accessed on 12/15/08. http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf

[22] County of Los Angeles, Department of Regional Planning. *Special Projects: Green Building Program.* Accessed on 7/17/08, http://planning.lacounty.gov/spGreenBuildingProgram.htm

[23] County of Los Angeles. "Ordinances for Green Building, Low Impact Development and Drought-Tolerant Landscaping," November 14, 2008. Accessed on 12/15/08. http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf

[24] ibid.

[25] County of Los Angeles, Department of Public Works. "Hydrology Manual," January 2006. Accessed on 7/31/08, http://dpw.lacounty.gov/wrd/publication/engineering/2006_Hydrology_Manual/2006%20Hydrology%20Manual-Divided.pdf

[26] County of Los Angeles. "Ordinances for Green Building, Low Impact Development and Drought-Tolerant Landscaping," November 14, 2008. Accessed on 12/15/08. http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf

[27] City of Los Angeles Department of Public Works, Bureau of Engineering. "Los Angeles River Revitalization Master Plan," April 2007. Available online at http://www.lariverrmp.org/CommunityOutreach/masterplan_download.htm

[28] Heal the Bay. Online News: *L.A. County Takes a Major Leap in Protecting Water Quality,* October 10, 2008. Accessed on 1/5/09, http://www.healthebay.org/news/2008/10-07_LACounty-LID/default.asp

[29] City of Los Angeles Department of Public Works, Bureau of Sanitation. "Water Quality Compliance Master Plan for Urban Runoff," Draft, December 4, 2007.

[30] City of Los Angeles Department of Public Works. *The Department of Public Works.* http://www.lacity.org/DPW/dpwhome.htm

[31] Zahniser, David. "City to pass the bucks on sidewalks?" *Los Angeles Times,* February 21, 2008. Accessed on 2/1/09, http://articles.latimes.com/2008/feb/21/local/me-sidewalk21

[32] Sonenshein, Raphael J. *Los Angeles: Structure of a City Government,* p.77. (2006) Published by the League of Women Voters of Los Angeles.

[33] Daniels, Paula (Commissioner, City of Los Angeles Board of Public Works.) "Green Streets LA," presentation to Local Government Commission, September 13, 2007. Accessed on 8/21/08, http://water.lgc.org/water-workshops/la-workshop/Green_Streets_Daniels.pdf/view

[34] Walla, Claire. "New SCNC environmental committee takes on local pollution," Interview with Commissioner Paula Daniels. *Sherman Oaks Sun.* Accessed on 9/4/08, http://www.suncommunitynewspapers.com/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=1004&cntnt01returnid=58

[35] Daniels, Paula (Commissioner for the City of Los Angeles Board of Public Works). "For the Board Meeting of 10-5-2007: Motion." Accessed on 9/4/08, http://eng.lacity.org/docs/dpw/agendas/2007%2F200710%2F20071005/bd/20071005_ag_cmrpd_1.pdf

[36] Cassidy, Arly, Josh Newell and Jennifer Wolch. "Transforming Alleys into Green Infrastructure for Los Angeles," June 2008. USC Center for Sustainable Cities. Accessed July 2008, http://college.usc.edu/geography/ESPE/documents/alleyreport_final_reduced.pdf

[37] City of Los Angeles Department of Public Works, Stormwater Program. *Elmer Avenue: A Model Stormwater Green Street.* Accessed November 2008, http://www.sga-inc.net/BACKUP/LA_newsletter/Elmer_Avenue.html

[38] ibid.

[39] Los Angeles & San Gabriel Rivers Watershed Council. *L.A. Basin Water Augmentation Study.* Accessed November 2008, http://www.lasgrwc.org/WAS.htm

[40] Los Angeles & San Gabriel Rivers Watershed Council. "Accomplishments: Fiscal Years 2002 – 2003 and 2003 – 2004." Accessed November 2008, http://www.lasgrwc.org/publications/AccomplishmentsFY02_04.pdf

[41] County of Los Angeles, Department of Public Works. "Los Angeles County BMP Effectiveness Study," August 2005. Accessed November 2008, http://dpw.lacounty.gov/wmd/NPDES/1994-05_report/Appendices/Appendix%20H-BMP%20Effectiveness.pdf

[42] City of Los Angeles, Department of Public Works, Stormwater Program. *Coming to a Neighborhood Near You - Disconnected Downspouts.* Accessed November 2008, http://www.sga-inc.net/BACKUP/LA_newsletter/Coming_to_a_Neighborhood_Near_You.html

[43] City of Los Angeles, Department of Public Works, Public Affairs Office. "City Asks Residents to Disconnect Downspouts and Help Save Water, Reduce Urban Runoff," Press release, 12/24/08. Accessed 1/4/09, http://www.ci.la.ca.us/bpw/press/bpwpress9057412_12242008.pdf

[44] Clean Air Cool Planet. *Green Building Ordinances.* Accessed 1/5/09, http://www.cleanair-coolplanet.org/for_communities/green_building_ordinances.php (This website lists community programs around the county with Green Building Ordinances.)

[45] City of Santa Monica, Energy & Green Building Programs. *New Green Building Ordinance.* Accessed on 1/3/09, http://greenbuildings.smgov.net/index.html

[46] City of Santa Monica, Energy & Green Building Programs. "Santa Monica Residential Green Building Guide." Accessed on 1/3/09, http://greenbuildings.smgov.net/pdf/Residential_GB_Guidelines.pdf

[47] County of San Diego, Department of Planning and Land Use. "Low Impact Development Handbook: Stormwater Management Strategies," December 31, 2007. Accessed November 2008, http://www.co.san-diego.ca.us/dplu/docs/LID-Handbook.pdf

[48] Village Homes (Davis, CA). *About Village Homes.* Accessed November 2008, http://www.villagehomesdavis.org/public/about

[49] City of Emeryville (CA), Department of Planning & Building. "Stormwater Guidelines for Green, Dense Redevelopment," December 2005. Accessed on 1/3/09, http://www.ci.emeryville.ca.us/planning/pdf/stormwater_guidelines.pdf

[50] San Francisco Public Utilities Commission. *Rainwater Harvesting Program.* Accessed on 12/31/08, http://sfwater.org/msc_main.cfm/MC_ID/14/MSC_ID/361

Part II:

Making LID Work for Los Angeles

Bioswale installed voluntarily by the developer of 1100 S. Hope Street in downtown Los Angeles.

[6] Funding & Maintaining a LID Program

How Much Does LID Cost?

Pilot projects have shown that using low impact development (LID) techniques instead of conventional stormwater controls can result in considerable capital cost savings. **An analysis of LID projects from across the nation conducted by the U.S. Environmental Protection Agency (EPA) in 2007 found that with just a few exceptions, the capital costs of LID projects were less than conventional water management controls.** As shown in the table below, savings ranged from 15–80%.[1] (Please see Appendix III for a fact sheet about the report.) It is important to note that the EPA's analysis did not account for the value of the environmental, social and community benefits created by the projects.

Project [a]	Estimated Conventional Development Cost	Actual LID Cost	Cost Savings[b]	Percent Savings[b]
2nd Avenue SEA Street (Washington)	$868,803	$651,548	$217,255	25%
Auburn Hills (Wisconsin)	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall (Washington)	$27,600	$5,600	$22,000	80%
Bellingham Park (Washington)	$52,800	$12,800	$40,000	76%
Gap Creek (Arkansas)	$4,620,600	$3,942,100	$678,500	15%
Garden Valley (Washington)	$324,400	$260,700	$63,700	20%
Kensington Estates (Washington)	$765,700	$1,502,900	–$737,200	–96%
Laurel Springs (Wisconsin)	$1,654,021	$1,149,552	$504,469	30%
Mill Creek[c] (Illinois)	$12,510	$9,099	$3,411	27%
Prairie Glen (Wisconsin)	$1,004,848	$599,536	$405,312	40%
Somerset (Maryland)	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus (Illinois)	$3,162,160	$2,700,650	$461,510	15%

EPA Report:

Cost Comparisons Between Conventional and LID Approaches

Notes:

[a] Some of the case study results do not lend themselves to display in the format of this table (Central Park Commercial Redesigns, Crown St., Poplar Street Apartments, Prairie Crossing, Portland Downspout Disconnection, and Toronto Green Roofs).

[b] Negative values denote increased cost for the LID design over conventional development costs.

[c] Mill Creek costs are reported on a per-lot basis.

Source: "Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices." USEPA, 2007.

The above examples include projects such as Seattle's first green street (SEA Street #1, described earlier in Chapter 5), which cost 25% less than conventional street designs,[2] and the extensive use of swales and rain gardens for a new subdivision in Somerset, MD, which saved developers 32% of the cost for conventional stormwater controls.[3]

Research conducted by the City of Ventura may be helpful in determining the potential costs of implementing low impact development in Los Angeles, as Ventura is also located in Southern California and has a similar climate. A copy of Ventura's "Green Streets Matrix" is included in Appendix II. It contains an analysis of the costs, benefits, challenges and drawbacks for 17 different kinds of LID best management practices. The City of Los Angeles' Green Streets LA program is also in the process of developing its own cost estimates.

GREEN STREETS MATRIX   City of Ventura Department of Public Works, 2008

Level I	Description	Example	Cost / Benefits	Challenges / Drawbacks
Storm Inlet Trash Excluders	Trash excluders are screens that are installed inside catch basins or at curb inlets. They prevent trash from entering the storm drain system. Screen size opening is typically around 4 mm. Smaller debris / silt and contaminants such as heavy metals will still pass through the screens.		Low cost/low effectiveness (~$1,500 each)	On-going maintenance is required to clean trash from catch basins. Only prevents trash from entering tributaries (not chemicals, silt). On-going maintenance costs for cleaning catch basins will increase as more are installed.
Planting of medium to large canopy trees in parkways and medians	Plant new or preserve existing medium to large canopy trees in parkways and medians. Tree species should be compatible with adjacent curbs and sidewalks to minimize potential damage that may be caused by roots.		Low upfront cost /high effectiveness (~$400 for 24" box tree). Once mature, larger canopy trees are effective in reducing peak storm run-off rates by capturing rainfall in their canopy. They are also very attractive and can raise property values by $10,000 or more.	Medium to high maintenance cost to control and preserve the trees. Bulbouts or sidewalk realignments may need to be installed in narrower parkways (see *Parkway Tree Bulbouts*). Tree roots can be destructive to buried utilities, sidewalks, curbs and gutters. Residents may not care for the increased maintenance (leaf pickup). Overhead utilities can be problematic for ongoing pruning that can damage trees.
Utilization of recycled materials in new and resurfaced streets	Utilize rubberized asphalt (recycled tires), 15% recycled mix, in-place pulverized asphalt and aggregates in the construction of new streets or in street resurfacing projects		Cost competitive compared to using new materials. Relative costs are likely to decrease due to supply constraints and hauling costs for new materials.	Projects may take longer to construct depending on time-of-year and other factors. Tighter inspections (QA/QC) also required.

A sample page from the City of Ventura's "Green Streets Matrix"

The Need for Maintenance Funding

In a time of government budget cuts, searching for steady funding to support new public works projects and regular maintenance services has never been more important. Consistent maintenance of low impact development (LID) best management practices will ensure that they continuously perform at a high standard. For instance, porous pavement needs to be vacuum-swept several times per year and vegetated swales may need occasional pruning or irrigation. The rest of this chapter highlights a number of ideas that could help secure a steady revenue stream for city projects and services.

Funding Strategies: Municipal Bonds

Municipal bonds can be issued by the City or its agencies to finance capital expenditures for public-purpose projects.[4] [5] There are two main categories of bonds: general obligation bonds that are secured by the government's taxing powers, and revenue bonds that are secured by a pledge of the project's revenues.[6] Municipal bonds could help raise funds for the construction and installation of new low impact development projects in the City of Los Angeles. However, bond money can only be used to cover capital costs; therefore ongoing maintenance expenditures must be funded from separate sources.

Fees & Assessments

LID In-Lieu Fees

Some areas of the city may be too densely developed to allow for significant levels of infiltration. For these locations, the City could raise funds by charging developers in-lieu fees, which would then go towards developing or maintaining LID projects nearby.[7] In-lieu fees would add some flexibility to low impact development regulations, making this a politically attractive option. Since low impact development aims to treat stormwater on the local level, it is very important that in-lieu projects be located close to their original project locations. (Read more in Chapter 10, p.97.)

Summary of LID Funding Strategies for Construction and Operations & Maintenance

	Strategy	Const.	O & M
Bonds	Municipal bonds	✓	
Fees & Assessments	LID in-lieu fees	✓	✓
	Increased stormwater abatement charge	✓	✓
	Individualized parcel drainage fees	✓	✓
	"One Percent for Green Streets" fund	✓	✓
	Parking increment financing	✓	✓
	Maintenance assessments		✓
	Quimby fees for parks	✓	
Grants	Dept. of Water & Power funding	✓	✓
	Proposition 84 grants	✓	
	Proposition O grants	✓	
	Private foundation grants	✓	✓
Partner-ships	"Adopt-A-Garden" program		✓
	Corporate sponsorship	✓	✓
Emerging Markets	Sales of L.A. City carbon offsets	✓	✓

Increased Stormwater Pollution Abatement Charge

The Stormwater Pollution Abatement Charge (SPAC)—found on residents' L.A. County tax bills—is used to generate "funds for receiving, transporting, pumping, constructing and maintaining storm drain facilities and for the treatment and/or disposal of storm drainage through the storm drain system."[8] The L.A. City Bureau of Sanitation's Watershed Protection Division receives this money (currently, approximately $28.6 million per year[9]) through the County of Los Angeles and uses it to develop and implement stormwater pollution abatement projects within City limits.

Increasing the Stormwater Pollution Abatement Charge could be a very good source of revenue for future LID projects and maintenance costs. The SPAC rate, originally set in 1993, is $23.00 per EDU (equivalent dwelling unit) and due to the constraints of Proposition 218 (which limits the ability of government to increase fees), it has been held at the same level for 15 years. **If the SPAC rate had increased with the national rate of inflation, then in 2008 it would have been $33.81,[10] generating an additional $13.4 million[11] for the City.** Thus the total SPAC revenue for the Watershed Protection Division in 2008 could have been $42 million instead of just $28.6 million, a 46% difference.

Using LID Rebates to Lower Residents' Stormwater Bills:

To create an economic incentive for retrofit of existing private properties, the City could develop an incentive structure that gives a rebate to businesses and residents who install low impact development features on their properties. The system could be designed so that properties which infiltrate and/or capture all of their runoff would not have to pay any SPAC fee at all. However, the fee imposed would likely have to be high enough to create an economic incentive.

Individualized Parcel Drainage Fees

Individualized stormwater drainage fees based on a property's impervious surface area has been a common practice in Germany for a number of years, but is relatively new to the United States.[12] Individual parcel assessments (IPAs) are especially appropriate for low impact development because (1) they provide an economic incentive for citizens to reduce the amount of impervious surface on their lots, (2) they affect the entire city (which supports the LID goal of decentralized stormwater management), and (3) the data collected from parcel assessments can provide the city with useful information for future watershed planning efforts.[13]

A vegetated swale with curb cuts collects runoff at the RioHondo Golf Course in Downey, CA.

In contrast to IPAs, the City of Los Angeles currently bases its stormwater pollution abatement fee on the number of dwelling units per lot—not on the size or amount of water-permeable surfaces found on the property. Consequently, there is no incentive for businesses or residents to install low impact development BMPs. The City could consider a rebate system that reduces or exempts fees for properties that capture or infiltrate 100% of their runoff.

The main drawback to IPAs is that estimating the impervious surfaces for each parcel can be labor intensive and expensive, though new satellite technology and mapping systems have made the task somewhat easier. To help with this problem, some German municipalities rely on customer questionnaires to establish a parcel's stormwater burden and/or to verify the government's estimates.[14] When there are small discrepancies, the customers' estimates are generally accepted. Larger discrepancies are resolved through site visits by the government agency.

To reduce the cost of estimating the impervious surface areas of each property in Los Angeles, during the first year of an IPA program the City could require businesses (and maybe even home owners) to pay for a professional site assessment, and then in the second year the public would start paying the drainage charges.

Example: Seattle's Stormwater Drainage Fees

The City of Seattle, WA charges all property owners an annual fee for stormwater management services based on each property's estimated impact on the municipal drainage system.[16] The revenues generated by this fee are used to build new stormwater management infrastructure and to fund ongoing operations and maintenance expenses.[17] Small lots are charged a flat-rate fee, while the fees for larger lots are based on their estimated amount of impervious surfaces (as determined by the City from 2007 aerial photos).[18 19] Properties with functional, on-site stormwater detention basins can apply for credits to reduce their drainage bills. The table on the previous page shows Seattle's 2009 drainage fees.

Seattle's 2009 Drainage Fee Rates [15]

Small Residential, Annual rate per parcel (a)	
Under 3000 sq. ft.	$102.90
3000-4999 sq. ft.	$149.56
5000-6999 sq. ft.	$202.17
7000-9999 sq. ft.	$256.38
All Other Properties, Annual rate per 1,000 sq. ft.	
Undeveloped (0-15% Impervious)	
Regular	$16.85
Low Impact (b)	$10.19
Light (16-35% Impervious)	
Regular	$25.20
Low Impact (b)	$18.98
Medium (36-65% Impervious)	
Regular	$36.61
Low Impact (b)	$29.70
Heavy (66-85% Impervious)	$47.34
Very Heavy (86-100% Impervious) (c)	$56.23

(a) Single Family Residential & Duplex parcels less than 10,000 sq. ft. which are charged a flat rate per parcel rather than a fee based on the percent impervious. Rates for other properties are per 1,000 sq. ft. based on the percent of impervious surface.
(b) A customer in the Undeveloped, Light or Medium rate category with a significant amount of highly pervious (absorbent) surface may qualify for the Low Impact rate.
(c) "Very heavy" does not necessarily mean heavily developed. A parking lot would be classified as "very heavy" since it is 100% impervious.

If Seattle's drainage fees were applied to Los Angeles, a typical residential lot sized at 50 feet x 130 feet (6,500 sq. ft. or about 1/7 of an acre) would be charged $202.17 per year. Again, the City of Los Angeles could then offer a rebate program that would give rebates to businesses and residents who install low impact development features on their properties. The system could even be set up so that properties which infiltrate and/or capture all of their runoff would not have to pay any drainage fee at all.

The City of Minneapolis, MN has a similar stormwater fee and credit program also based on a property's amount of impervious surface.[20]

"One Percent for Green Streets" Fund

The City of Portland, OR currently has a *One Percent for Green* fund that collects 1% of the construction budget for projects within the city's right-of-way that are not subject to the requirements of Portland's Stormwater Management Manual. The fund was established in 2007 when the Portland City Council passed its Green Streets Policy. The *One Percent for Green* fund is used to finance the construction of green street features that follow LID guidelines.[21] Private parties can apply for green streets grants to help fund the design, construction, and materials for LID projects. If a similar program were implemented in Los Angeles, it could be designed to fund operations and maintenance costs as well as construction costs.

Parking Increment Financing

Parking increment financing has the potential to generate significant revenues that could be used to build new low impact development projects, and more importantly, fund ongoing operations and maintenance costs.[22] "The High Cost of Free Parking" by UCLA Professor Donald Shoup cites Old Pasadena as an excellent local example.[23] In 1993, the City of Pasadena installed parking meters in the rundown area of Old Pasadena in order to raise funds for revitalization. The city reinvested the revenue from parking fees back into the neighborhood. They made local street improvements and repairs, and the Business Improvement District relies on the funds to pay for cleaning and maintenance services. In 2001, the parking meters in Old Pasadena generated $1.2 million in net revenue.[24] Today, Old Pasadena is one of the most popular shopping districts in the Los Angeles region.

One of L.A.'s new parking pay stations

Several factors may make parking increment financing a viable option for Los Angeles. First, the City started replacing its old parking meters in 2007 with centrally-controlled, computerized pay stations.[25 26] This technological advance allows the City to easily adjust parking fees. (Shoup's research suggests that parking prices should be set high enough to create a 15% vacancy rate on each block so that customers can always find an open spot.[27]) Second, to help tackle climate change, the City of Los Angeles is looking for ways to encourage people to get out of their cars and onto public transit. Higher parking rates could help achieve this goal. Finally, in the past couple years a number of American cities have considered implementing congestion pricing policies to reduce traffic. This has introduced the idea that people should pay for the privilege of driving—a notion that could also apply to parking increment financing.

In order to use parking increment financing to promote LID in Los Angeles, the City would need to ensure that an adequate amount of parking revenues is set aside for funding green streets projects and maintenance.

Special Benefit Assessment Districts

Special benefit assessment districts could be used to raise funds to acquire open space for low impact development programs or to create maintenance districts. Benefit assessment districts typically assess property owners in a defined geographic area and provide benefits to those residents, such as roads, parks, and recreational facilities,[28] but have also been used to fund sidewalk maintenance. An important principle is that property owners are assessed a fee that is proportional to the special benefits created by the improvements. If the assessment price exceeds the value of the special benefit, then the charges are considered a tax.[29]

The State of California has approximately twenty different statutes that authorize local agencies to levy assessments for specific purposes. The statutes that would be most relevant to a low impact development program include:[30]

1. Open Space Maintenance Act
2. Habitat and Maintenance Assessment District
3. Municipal Improvement Act of 1913
4. Landscaping and Lighting Act of 1972
5. Benefit Assessment Act of 1982—especially appropriate for LID because it is dedicated to assessments for the installation, operation and maintenance of drainage and flood control facilities.

Proposition 218, which was passed in 1996, governs the procedures for establishing a special benefit district. For instance, it requires that local property owners vote to approve assessments. Proposition 218 also rules that increased property values are not enough evidence to demonstrate special benefit; there must be other benefits, such as improved recreational opportunities or flood control.[31] It can be a challenge for government agencies to evaluate exactly how much a property will benefit from a project, making it difficult to determine the appropriate assessment fee.

Quimby Fees for Parks

The 1975 Quimby Act authorizes cities and counties in the State of California to pass ordinances that require developers to set aside land, donate conservation easements, or pay fees for park improvements. Revenues generated by the Quimby Act must go towards the creation of new parks and *cannot* be used for the general operations and maintenance of park facilities.[32] In Los Angeles, the fees must be used within two miles of where they are gathered.[33]

Bimini Slough Ecological Park, created by North East Trees in East Hollywood, daylights an existing storm drain and provides on-site stormwater management. *Credit: North East Trees*

As of February 2008, the City's Department of Recreation and Parks had a balance of $129 million in Quimby fees.[34] This surplus funding could be an excellent opportunity for the City to implement low impact development on a neighborhood scale by creating new parks. (Quimby fees cannot be used for ongoing maintenance operations.) The City could require that all Quimby projects employ LID best management practices, and if possible, runoff from the local area should be directed into the parks (instead of the storm drains). Additionally, projects would have to be distributed throughout the city since Quimby fees must be used within two miles of their origination. This requirement actually dovetails well with low impact development's goal of decentralized stormwater management using natural drainage techniques.

Grants

Department of Water & Power Funding

The Los Angeles Department of Water & Power (LADWP) is concerned about securing Los Angeles' water supply for the future. Currently only 13% of our water comes from local sources, but widespread implementation of low impact development could increase that amount significantly.[35] LADWP has begun funding LID pilot projects and is considering implementing programs that train landscape maintenance workers in LID techniques.

Proposition 84 Grants

Proposition 84, titled "Water Quality, Safety and Supply. Flood Control. Natural Resource Protection. Park Improvements," was passed by California voters in November 2006.[36] It authorized $5,388,000,000 in general obligation bonds to fund projects for "safe drinking water, water quality and supply, flood control, waterway and natural resource protection, water pollution and contamination control, state and local park improvements, and public access to natural resources, and water conservation efforts."[37] The State Water Resources Control Board runs a Proposition 84 Stormwater Grant Program to provide local agencies with funds to reduce pollution flowing into waterways.[38] This could be a promising source for funding future LID projects in Los Angeles.

Proposition O Grants

Los Angeles voters passed Proposition O in Novermber 2004. It authorized the City of Los Angeles to issue up to $500 million in general obligation bonds for projects that clean up water pollution in order to meet Federal Clean Water Act requirements.[39] It also funds improvements to protect water quality, provide flood protection, and increase water conservation, habitat protection, and open space—all of which are important aspects of low impact development.[40]

Curb cuts leading to an infiltration zone at the Rio Hondo Golf Course in Downey, CA

Private Foundation Grants

Private foundations may be interested in funding low impact development pilot projects, citizen education programs, vocational training for LID landscaping professionals and gardeners.

Public-Private Partnerships

Adopt-a-Garden

The Crown Street pilot project in Vancouver, British Columbia, is a good example of how city residents can help maintain LID landscaping and best management practices.[41] In order to protect local salmon habitat, Vancouver's Green Streets program rebuilt Crown Street to include vegetated swales and rain gardens.[42] Since the city does not have enough funding to maintain the project, they rely on the local community to take care of the landscape features. Residents must apply to adopt a garden.[43] If accepted, the city gives them a manual on how to keep the vegetation healthy. As an incentive, Vancouver also provides some gardening materials and pays for some of the residents' gardening costs.

Swale in the middle of Vancouver's Crown Street pilot project. *Credit: Vancouver Dept. of Eng.*

The Adopt-a-Garden concept is a viable, low-cost idea for the City of Los Angeles that does not involve many political hurdles for implementation. A team of student researchers from Pepperdine University[44] has recommended that Los Angeles hold annual garden competitions to motivate the citizen gardeners and to raise awareness about the Adopt-a-Garden program. Partnerships with organizations such as the Los Angeles chapter of California Garden Clubs Inc., the L.A. County Arboretum, North East Trees, TreePeople, and landscape design schools could help with the design, promotion and implementation of this program.

Corporate Sponsorship

Corporate sponsorship for the installation and/or maintenance of low impact development BMPs could help reduce some of the City's expenditures on green infrastructure and foster the involvement of businesses in the community. Sponsorships can come in various forms, such as cash donations, product donations, pro bono services, and employee volunteers. In exchange, the city could provide some incentives for the businesses such as public recognition or signage that identifies the LID BMPs paid for or maintained by corporations.

Emerging Markets

Sales of L.A. City Carbon Offsets

Recently, a number of companies have made efforts to become "carbon neutral" by purchasing carbon offsets to counterbalance their impacts on the environment. This could be an appropriate option for businesses (such as corporate offices) that traditionally have been seen as non-polluting, but may actually cause local air pollution due to employee travel and the energy used by office buildings. Moreover, ordinary residents who are eager to reduce their carbon footprints can also purchase carbon offsets. Municipal carbon offset programs are relatively new. In the United States, the San Francisco Carbon Fund[45] is currently under development and the Colorado Carbon Fund[46] is up and running.

Establishing a "Los Angeles Carbon Fund" would ensure that carbon offset money goes towards *local* climate change mitigation projects, instead of projects in far-off locations across the globe. Carbon offset money could be used to fund the construction and maintenance of LID projects in Los Angeles such as bioswales and tree plantings. The City of Los Angeles may wish to consider starting with a voluntary carbon offset pilot program, and then making it mandatory in future years. Implementing a simple carbon offset program could be a very cost-effective way to raise funds. Users could make their payments online by credit card.

The greatest hurdles to implementing a carbon offset program are: (1) figuring out how much carbon emissions a person or business generates, (2) calculating the quantity of emissions "saved" by an offset project, and (3) for how much a unit of carbon should be sold. However, to implement a voluntary pilot program, the calculations need not be complicated—rough estimates should be adequate, and Los Angeles may be able to look to Colorado's program as a model.

The Colorado Carbon Fund's website (www.coloradocarbonfund.org) has a simple carbon footprint calculator that lets users figure out how many metric tons of CO_2 are emitted by their homes, automobiles and airplane flights each year. The Fund charges approximately $20.00 per year or $1.67 per month for one metric ton of CO_2.[47] Before the website calculates offset fees, users are directed to a web page that contains advice on how to reduce their energy consumption and environmental impact.[48] This important educational feature may help reduce the carbon footprints of Colorado residents in the future.

For More Information:

For more information and case studies about funding green infrastructure, please refer to the 2008 EPA publication titled, "*Managing Wet Weather with Green Infrastructure: Municipal Handbook - Funding Options.*" It can be accessed at http://www.epa.gov/npdes/pubs/gi_munichandbook_funding.pdf.

Endnotes

[1] U.S. Environmental Protection Agency. *Fact Sheet: Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007. From the Polluted Runoff (Nonpoint Source Pollution) web page. Accessed on 1/3/09, http://www.epa.gov/owow/nps/lid/costs07/factsheet.html

[2] Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning*, the magazine of the American Planning Association. August/September 2008. Pages 14-19.

[3] ibid.

[4] Municipal Securities Rulemaking Board. *What Are Bonds?* Accessed on 1/10/09, from Electronic Municipal Market Access. http://emma.msrb.org/EducationCenter/WhatAreBonds.aspx

[5] Investopedia ULC. *What Does Municipal Bond Mean?* and *Investopedia explains Municipal Bond.* Accessed on 1/10/09, from Investopedia. Web site: http://www.investopedia.com/terms/m/municipalbond.asp

[6] Fahim, Mayraj. *Municipal bonds have been issued by US local government since 1812* (abridged), May 14, 2008. Accessed on 1/10/09, from City Mayors. Web site: http://www.citymayors.com/finance/bonds.html

[7] Conversation with Dr. W. Bowman Cutter (Assistant Professor, Department of Economics, Pomona College), 8/13/08.

[8] City of Los Angeles, Department of Public Works, Bureau of Sanitation. *Stormwater Pollution Abatement Charge.* Accessed on 1/11/09, from City of Los Angeles, Department of Public Works, Bureau of Sanitation, Financial Management Division. Web site: http://lacitysan.org/fmd/spac.htm

[9] City of Los Angeles, internal document. "Stormwater Pollution Abatement Fund: Basis for the Proposed Budget, 2007-2008."

[10] Calculations made using the United States Department of Labor/Bureau of Labor Statistics' "Consumer Price Index (CPI) Inflation Calculator." http://data.bls.gov/cgi-bin/cpicalc.pl

[11] Calculations made using the United States Department of Labor/Bureau of Labor Statistics' "Consumer Price Index (CPI) Inflation Calculator." http://data.bls.gov/cgi-bin/cpicalc.pl

[12] Keely, Melissa. "Using Individual Parcel Assessments to Improve Stormwater Management." Journal of the American Planning Association, Vol. 73, No. 2, Spring 2007.

[13] ibid.
[14] ibid.

[15] City of Seattle (WA). *Drainage Rate Schedule.* Accessed on 1/10/09 from Seattle.gov, http://www.ci.seattle.wa.us/util/Services/Drainage_&_Sewer/Rates/DrainageRates/RateSchedule/index.htm

[16] City of Seattle (WA). *Drainage Rates.* Accessed on 1/10/09 from Seattle.gov, http://www.ci.seattle.wa.us/util/Services/Drainage_&_Sewer/Rates/DrainageRates/index.htm

[17] City of Seattle (WA). *Drainage Rate Increase FAQ.* Accessed on 1/10/09 from Seattle.gov, http://www.ci.seattle.wa.us/util/Services/Drainage_&_Sewer/Rates/DrainageRates/RateIncreaseFAQ/index.htm

[18] City of Seattle (WA). *Drainage Rate Schedule.* Accessed on 1/10/09 from Seattle.gov, http://www.ci.seattle.wa.us/util/Services/Drainage_&_Sewer/Rates/DrainageRates/RateSchedule/index.htm

[19] City of Seattle (WA). *Understanding Your Drainage Bill FAQ.* Accessed on 1/10/09 from Seattle.gov, http://www.ci.seattle.wa.us/util/Services/Drainage_&_Sewer/Rates/DrainageRates/UnderstandingYourBillFAQ/index.htm

[20] City of Minneapolis (MN). (1997-2009). *Stormwater Utility Fee Frequently Asked Questions.* Accessed on 1/10/09 from Minneapolis: City of Lakes, http://www.ci.minneapolis.mn.us/stormwater/fee/stormwater_faq.asp

[21] City of Portland (OR). *1% for Green.* Accessed on 1/10/09 from Portland Bureau of Environmental Sciences. Web site: http://www.portlandonline.com/bes/index.cfm?c=48702&

[22] Conversation with Dr. W. Bowman Cutter (Assistant Professor, Department of Economics, Pomona College), 8/13/08.

[23] Shoup, Donald, *The High Cost of Free Parking, Chapter 1 (The Twenty-first Century Parking Problem).* Chicago: Planners Press, 2005. Accessed on 1/10/09 from Donald Shoup's UCLA webpage, http://shoup.bol.ucla.edu/Chapter1.pdf

[24] Kolozsvari, Douglas and Shoup, Donald. (2003). *Turning Small Change Into Big Changes.* Accessed on 1/10/09 from Walkable Streets, http://www.walkablestreets.com/meter.htm

[25] Powell, Amy. *New and improved parking meters unveiled*, December 13, 2007. Accessed on 1/10/09 from KABC-TV Los Angeles, http://abclocal.go.com/kabc/story?section=news/local&id=5833424

[26] Sentinel News Service. *New Parking Meters to Increase City's Revenue*, January 1, 2009. Accessed on 1/10/09 from Los Angeles Sentinel, http://www.lasentinel.net/New-Parking-Meters-to-Increase-City-s-Revenue.html

[27] Shoup, Donald C. (1999). "The Trouble With Minimum Parking Requirements." *Transportation Research Part A*, Vol. 33, pp. 549-574. Accessed on 1/10/09 from Victoria Transport Policy Institute, http://www.vtpi.org/shoup.pdf

[28] The Trust For Public Land. *Benefit Assessment Districts.* Accessed on 1/10/09 from The Trust For Public Land: Conservation Finance, http://www.tpl.org/tier3_cd.cfm?content_item_id=1058&folder_id=825

[29] Institute For Local Government. (2005) *Funding Open Space Acquisition Programs: A Guide for Local Agencies in California*, "Chapter 8: Creating Benefit Assessment Districts." Accessed on 1/10/09 from League of California Cities, http://www.cacities.org/resource_files/23925.ILG_OpenSpace_Ch8.pdf

[30] ibid.
[31] ibid.

[32] Westrup, Laura. "Quimby Act 101: An Abbreviated Overview." *California Parks & Recreation*, Vol. 58, no. 3, p. 8 (2002). Accessed on 1/11/09 from California Park & Recreation Society, http://www.cprs.org/membersonly/Sum02_Quimby.htm

[33] Scott, Anna. "Quimby Questions Continue." *Los Angeles Downtown News*, October 15, 2007, p. 6. Accessed on 1/11/09 from Los Angeles Downtown News.com, http://www.downtownnews.com/articles/2007/10/15/news/news04.txt

[34] Richardson, Eric. (2009). *Catching Up With… Quimby Fees.* Accessed on 1/11/09 from BlogDowntown, http://blogdowntown.com/2009/01/3929-catching-up-with-quimby-fees

[35] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices—Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[36] League of Women Voters. (2006). *Proposition 84—Water Quality, Safety and Supply. Flood Control. Natural Resource Protection. Park Improvements State of California.* Accessed on 1/11/09 from League of Women Voters of California Education Fund, http://www.smartvoter.org/2006/11/07/ca/state/prop/84/

[37] California State Parks. (2006). *Proposition 84—Water Quality, Safety and Supply. Flood Control. Natural Resource Protection. Park Improvements State of California. Official Title and Summary.* Accessed on 1/11/09 from California State Parks, http://www.parks.ca.gov/pages/1008/files/Prop_84_text.pdf

[38] California Environmental Protection Agency, State Water Resources Control Board. *Proposition 84 Storm Water Grant Program.* Accessed on 1/11/09, http://www.waterboards.ca.gov/water_issues/programs/grants_loans/prop84/index.shtml

[39] City of Los Angeles, Proposition O website. *Proposition O Background.* Accessed on 1/11/09, http://www.lapropo.org/

[40] City of Los Angeles, Department of Public Works, Bureau of Engineering. "Proposition O – Clean Water Bond Program: August 2008 Monthly Report." Accessed on 1/11/09, http://www.lapropo.org/sitefiles/docs/engineering/BOE_MnthlyReport_August.pdf

[41] Collins, Gregory M., Jared Weidenbaum, Lu Xing, Scott Scholnick, Cathy Lysaught, Vanessa Towning, and Li Feng. "Social Entrepreneurship: This document consists of our research and recommendations with regard to the maintenance and funding of Los Angeles's 'Green Street' Initiative." Report by students from Pepperdine University done for the L.A. City Board of Public Works. December 5, 2007.

[42] City of Vancouver (Canada), Engineering Services. *Streets: Environmentally Sustainable Options.* Accessed on 1/11/09, http://vancouver.ca/ENGSVCS/streets/design/enviro.htm

[43] City of Vancouver (Canada), Engineering Services. *Streets: Green Streets Program.* Accessed on 1/11/09, http://vancouver.ca/engsvcs/streets/greenstreets/index.htm

[44] Collins, Gregory M., Jared Weidenbaum, Lu Xing, Scott Scholnick, Cathy Lysaught, Vanessa Towning, and Li Feng. "Social Entrepreneurship: This document consists of our research and recommendations with regard to the maintenance and funding of Los Angeles's 'Green Street' Initiative." Report by students from Pepperdine University done for the L.A. City Board of Public Works. December 5, 2007.

[45] City and County of San Francisco. *Press Room: Press Release.* "Mayor Newsom Unveils First-Ever City Carbon Offsets to Fight Global Warming," December 18, 2007. Accessed on 1/12/09, http://sfgov.org/site/mayor_index.asp?id=72509

[46] Colorado Carbon Fund. *Project C: We Have The Power.* Accessed on 1/12/09, http://www.coloradocarbonfund.org/

[47] Calculated on 1/12/09 using the Colorado Carbon Fund's carbon footprint calculator. http://www.coloradocarbonfund.org/think_1.cfm

[48] Colorado Carbon Fund. *Take Action, Save Money.* Accessed on 1/12/09. http://www.coloradocarbonfund.org/act.cfm

[7] Existing Stormwater Regulations & Green Infrastructure Programs in Los Angeles

A comprehensive low impact development (LID) ordinance would help protect the integrity of Los Angeles' natural waterways and ensure a more stable water supply for the future; fortunately, a number of existing regulations and programs could serve as building blocks for the city's future LID efforts. Existing stormwater regulations and green infrastructure programs that apply to the City of Los Angeles originate from the federal, state, county and city levels of government.

Federal and State Regulations & Programs

National Pollution Discharge Elimination System (NPDES)

The federal Clean Water Act requires the U.S. Environmental Protection Agency (EPA) to regulate the amount of pollution that flows into the waters of the United States. The EPA established the National Pollution Discharge Elimination System (NPDES) permitting program to address this issue.[1] There are two types of permits that are most pertinent to LID efforts in Los Angeles: (1) the Municipal Stormwater Permit, and (2) the General Construction Activities Stormwater Permit.

Within California, the EPA authorizes the state government to run the NPDES permitting program. Therefore, our local L.A. County NPDES stormwater permit is essentially overseen by both the state and federal governments.

Municipal Stormwater Permit—In cities like Los Angeles that have a "municipal separate storm sewer system" (known as MS4s), the storm drains flow straight into rivers and oceans, with no treatment facilities along the way.[2] [3] The NPDES permits that

Existing Regulations & Programs

Federal & State Level

- National Pollution Discharge Elimination System (NPDES)
- California Porter-Cologne Water Quality Control Act
- California Model Landscape Ordinance*

County Level

- L.A. County Stormwater Permit and SUSMP
- Low Impact Development Ordinance & Green Building Program

City Level

- City of L.A. Stormwater Program
- Green Streets LA Program
- Million Trees LA Initiative
- Green Building Ordinance
- Landscape Ordinance
- Stream Protection Ordinance*
- Zoning Ordinances
- General Plan, Community Plans & Specific Plans
- L.A. River Revitalization Master Plan
- L.A. River Improvement Overlay District*
- Integrated Resources Plan
- Water Quality Compliance Master Plan

** Regulation that is proposed or in the development stage. Has not been fully adopted or implemented.*

are issued to MS4 municipalities require the use of best management practices (BMPs) to reduce pollutants to the "maximum extent practicable."[4] (A description of the related L.A. County SUSMP stormwater standards can be found on the next page.) The NPDES permits must be renewed every five years, which creates some instability for stormwater protection in Los Angeles because future permits could have less stringent environmental controls.

General Construction Activities Stormwater Permit— The State Water Resources Control Board (SWRCB) adopted its last statewide NPDES General Stormwater Permit for Construction Activities in 1999, and is well overdue for its five-year renewal.[5] The permit's section on "Post-Construction Storm Water Management"[6] contains language to reduce runoff from sites of one acre or more. It states that properties should have best management practices (BMPs) that "minimize impervious surfaces" and treat "storm water runoff using infiltration, detention/retention, biofilter BMPs, and efficient irrigation systems."[7]

Playa del Rey beach in Los Angeles after a storm.
Credit: Heal the Bay / HF Chau

While these requirements speak to fundamental low impact development (LID) principles, there are some limitations to the state's post-construction stormwater permit:[8]

1. ***The permit applies only to large sites*** of one acre or more, which is problematic because the City of Los Angeles has many smaller lots.[9] (Construction projects on smaller lots fall under the municipal MS4 stormwater permit.)
2. ***The permit only regulates newly-built construction or redevelopment projects.*** It does not address older properties that could benefit from a retrofit program.

Porter-Cologne Water Quality Control Act, 1969

The Porter-Cologne Water Quality Control Act (also known as the California Water Code) was enacted by California in 1969 to protect the state's surface and groundwater quality and resources. Under this act, the State and Regional Water Quality Control Boards can establish water policies, administer federally-mandated MTBE permits, enforce water quality standards, and regulate point-source and non-point source discharges.[10] Nine Regional Boards develop regional water quality control plans based on the State Board's policies.[11]

Porter-Cologne makes a very important point related to low impact development (LID) and stormwater management: *waste discharges to state waters are a privilege, not a right.*[12] To further protect ocean and surface water quality, the State Board has adopted statewide water quality control plans such as the California Ocean Plan and a Plan for California's Non-Point Source Pollution Control Program.[13]

State of California Model Landscape Ordinance *(adoption pending)*

California's Department of Water Resources (DWR) is currently working on an update of the state's "Model Water Efficient Landscape Ordinance." DWR planed to adopt the revised ordinance in March 2009,[14] and local municipalities will be expected to adopt it by 2010. Local governments will have the option to adopt their own landscape ordinance as long as it is "at least as effective as" the state's model.[15]

The updated model landscape ordinance will cover new construction and rehabilitated landscapes (both public and private) of at least 2,500 square feet. The ordinance also requires existing landscapes of at least 43,560 sq. ft. to conduct landscape irrigation audits every five years.[16] Compared to the current landscape ordinance, the updated version places a greater emphasis on efficient irrigation systems and reducing water waste.[17]

The model landscape ordinance does require landowners to implement a number of LID strategies such as grading sites to reduce erosion and runoff, installing efficient irrigation systems, and installing recycled water irrigation systems. However, other important LID strategies are highly recommended but *not* required. They include the use of native and drought-tolerant plants and the installation of stormwater BMPs.[18]

Drought-tolerant landscaping in West L.A.

Los Angeles County Regulations & Programs

L.A. County Stormwater Permit and SUSMP

As mentioned earlier in this chapter, the L.A. County Municipal Stormwater Permit addresses federal NPDES requirements and is administered by the State of California. The permit standards are written by the Los Angeles Regional Water Quality Control Board and must be reissued every five years.[19]

An important part of the County's NPDES permit, which applies to the City of Los Angeles, is the Standard Urban Stormwater Mitigation Plan (SUSMP) infiltration requirements. In general, SUSMP applies to new and redevelopments of a certain minimum size.[20] The best management practices installed on-site must be able to infiltrate, capture and reuse, or treat all of the runoff from an 85th percentile storm, which equivalent to a ¾" storm. New guidelines approved on July 9, 2008 require developers to give top priority to BMPs that infiltrate stormwater and lowest priority to mechanical/hydrodynamic units.[21]

Although many of Los Angeles' existing low impact development BMPs were installed thanks to SUSMP requirements, there are some drawbacks to relying solely on SUSMP to fulfill the city's low impact development needs. First, SUSMP was designed to reduce the amount of pollution entering our waterways and is therefore especially focused on reducing the environmental damage caused by the first flush of a storm. The fact that SUSMP BMPs sometimes address groundwater recharge and can increase local water supply is incidental. Since SUSMP standards do not require native and/or drought-tolerant plants in landscape BMPs, this could actually have the unintended consequence of exacerbating L.A.'s water conservation issues, as developers could install water-thirsty plants requiring large amounts of irrigation during the dry season.

Also, SUSMP only applies to new and major redevelopments, leaving out a large amount of existing development in Los Angeles. Third, the L.A. County Stormwater Permit must be reissued every five years, and there is no guarantee that new stormwater permits will have the same requirements as previous ones. Finally, the legality of the stormwater permit (and accompanying SUSMP requirements) is currently being challenged. In the case of Cities of Arcadia, et al. v. State Water Resources Control Board, et al. (Superior Court of Orange County, 2007, No. 06CCO2974) the court concluded that the L.A. Regional Water Quality Control Board "failed to consider whether the standards could be met and the economic effect they would have."[22] [23] The county's stormwater permit program has been put on hold until the issue is resolved.

Low Impact Development Ordinance & Green Building Program

In October 2008, the County of Los Angeles passed a comprehensive Green Building Program supported by a trio of ordinances: the 1) Green Building Ordinance, 2) Drought-Tolerant Landscaping Ordinance, and 3) Low Impact Development Ordinance.[24] These ordinances are augmented by the "Low Impact Development Standards Manual"[25], "Green Building and Sustainability Guidelines"[26] and a "Drought-Tolerant Plant List."[27] Together, the three ordinances will discourage the use of impervious surfaces and excess turf landscaping, while requiring green building methods, smart irrigation, the use of stormwater BMPs, and drought-tolerant landscaping.[28] [29] [30] [31]

The Green Building Program's ordinances will only apply to the *unincorporated* portions of Los Angeles County. They will also affect the County of Los Angeles' capital construction projects (such as libraries and administration buildings) regardless of the city in which they are located.[32] **Even though the County's ordinances do not apply to the City of Los Angeles, the City will still benefit from the LID improvements made to neighboring portions of the watershed.** Notably, the County's LID Ordinance is that it only applies to new developments and major redevelopments, not existing properties. A more detailed description of the County's Green Building Program can be found in Chapter 5, and a copy of the LID ordinance can be found in Appendix II.

City of Los Angeles Regulations & Programs

City of Los Angeles Stormwater Program

The City of Los Angeles' Stormwater Program is run by the Department of Public Works. It has two major divisions—Pollution Abatement and Flood Control. The program focuses on reducing stormwater pollution through the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit.[33] The Stormwater Program is the city's major source of public information regarding stormwater best management practices, which include many LID strategies.

Green Streets LA Program

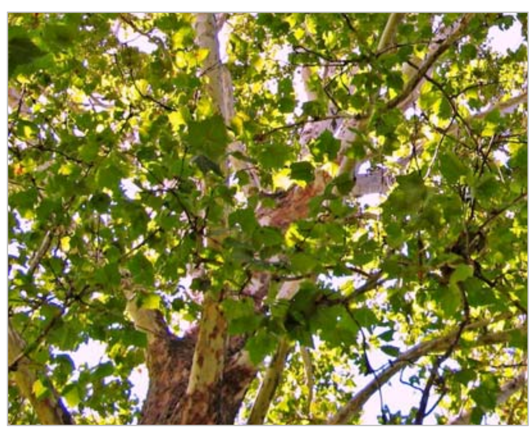
Contaminated stormwater runoff is the largest source of ocean pollution in Southern California,[34] and the city's street infrastructure plays a major role in flushing these pollutants out to sea. The city has approximately 6,500 miles of streets with 10,000 miles of sidewalk and 34,000 catch basins.[35] The **Green Streets LA** program was initiated by the Board of Public Works with the idea that the streets of Los Angeles offer an enormous opportunity to infiltrate, capture and filter urban runoff to prevent pollution, and to convert stormwater into a valuable source of groundwater and recycled water.[36]

The Green Streets Committee is comprised of representatives from a number of city departments that work on issues related to street infrastructure. Monthly meetings are designed to help facilitate communication and coordination between these entities. Recently, Green Streets has focused on integrating LID practices into City infrastructure programs and construction standards. A preliminary set of Green Streets design guidelines were developed in 2008, and a pilot project on Riverdale Avenue is in development.

The **Green Alleys Committee** (a subcommittee of Green Streets) is working on identifying alleys in Los Angeles that could become pilot projects for a green retrofit. There is a total of 914 linear miles of alleys within the City of Los Angeles.[37] The committee is also investigating funding opportunities. The main representatives on the Green Alleys Committee come from the Board of Public Works, the Community Redevelopment Agency and the USC Sustainable Cities Program.

Million Trees LA initiative

The Million Trees L.A. (MTLA) Initiative was created by Mayor Villaraigosa with the goal of making Los Angeles the largest, cleanest, and greenest city in the United States.[38] Through public-private partnerships, one million trees will be planted throughout Los Angeles.



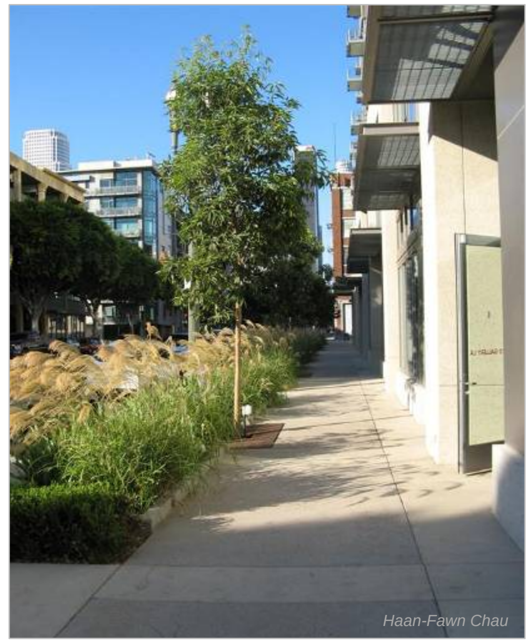
Canopy of a native sycamore tree. *Credit: Haan-Fawn Chau*

MTLA can help low impact development by providing more landscaping, stormwater capture and infiltration opportunities in the city. The water benefits of planting trees far outweigh the water lost to irrigation.[39] Additionally, planting large canopy trees reduces the urban heat island effect.

City Green Building Ordinance

Signed by the mayor on Earth Day 2008, the City of Los Angeles' Green Building Ordinance requires large, new developments to meet the intent of the U.S. Green Building Council's LEED green building standards. (Actual LEED certification is optional.) Additionally, large redevelopments that spend more than 50% of the replacement cost of the existing building must also meet LEED standards.[40]

LEED green building standards include a number of LID strategies in the categories of "Sustainable Sites" and "Water Efficiency," but it is possible for a developer to construct a LEED certified building while avoiding any significant water management or conservation measures.[41] LEED does not address exterior landscaping issues nearly as well as it addresses the composition of an actual building. Additionally, only LEED-ND (Neighborhood Design) standards address street infrastructure, and it involves a completely separate process from the LEED certification of an individual building.



Bioswales and tree wells along 1100 S. Hope Street in downtown Los Angeles

City Landscape Ordinance

The L.A. City Landscape Ordinance, originally written in 1996, was revised in April 2005 to make it a "more effective tool for reducing landscape water use, to mitigate the urban heat island effect, to reduce the dependence on fossil fuels to heat and cool buildings, to address surface erosion, and to improve groundwater recharge."[42] As noted earlier in this chapter, in 2010 the City of Los Angeles will be required to either adopt The State of California's "Model Water Efficient Landscape Ordinance" (described earlier in this chapter) or update its current ordinance to meet or exceed the State's standards.

At the heart of the current Landscape Ordinance, there are two points-based systems: a landscape points system and a water management points system.[43] Every new development project must attain a certain number of points for each system based on the size of the site. The landscape points system contains a number of measures that overlap with low impact development, such as the installation of drought-tolerant trees and plants, permeable pavement and reduced grading (cut and fill). The water management points system also includes drought tolerant plants, as well as rainfall recharge areas and the use of reclaimed water for irrigation.

Despite these features, the current Landscape Ordinance cannot fulfill low impact development principles on its own. First, the ordinance applies only to new construction projects and major renovations that require building, grading, or land-use permits. It does not encompass the vast quantity of existing buildings in Los Angeles. Second, the ordinance mentions a number of LID techniques but does not actually require projects to use them. The current flexibility of the points-based system makes it possible for developers to fulfill their landscape points using measures such as recycling vegetative waste, widening sidewalks at bus shelters, putting utility lines underground, installing ecological art, and providing handicapped accessibility—all of which are beneficial to the community but do not help with low impact development efforts. Finally, the landscape ordinance does not have measures that specifically focus on slowing down the velocity of stormwater.

City Stream Protection Ordinance *(proposed)*

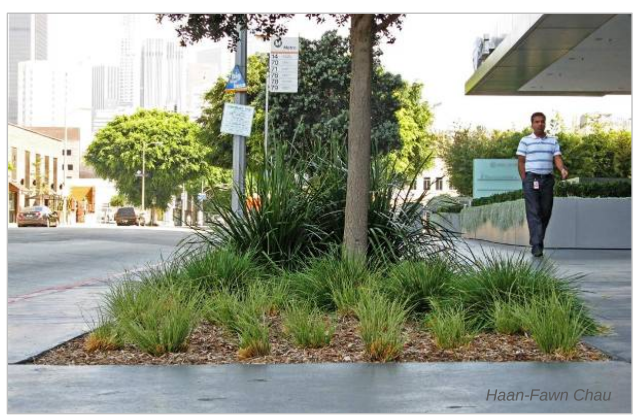
In October 2007, the Stream Protection Task Force completed a draft for a proposed Stream Protection Ordinance. Its goals are to: "(1) protect a valuable natural resource; (2) protect and maintain the existing ephemeral, perennial, intermittent or seasonal streams located within the City of Los Angeles; (3) protect and maintain native vegetation in riparian and wetland areas."[44] The main provision of this proposed ordinance is a 100-foot setback from the stream's edge with two zones: a 30-foot protected zone of no new development and a 70-foot buffer zone that allows limited development.

If enacted, the Stream Protection Ordinance would support low impact development by ensuring enough open space to allow for infiltration and groundwater recharge. By limiting development next to streams, the possibility of new pollution entering the watershed is also reduced.

It is important to note that the proposed ordinance also defines what a stream is. This is essential in L.A.'s dry climate since many streams do not run year-round. The June 2008 decision made by the U.S. Army Corps of Engineers to reduce the status of the Los Angeles River to "non-navigable" in most locations underscores this point. "Non-navigable" rivers are *not* protected by the Clean Water Act, the NPDES permit system, or L.A. County SUSMP standards. Therefore, local ordinances would be a more certain way to protect Los Angeles' waterways in a changeable political climate.

City Zoning Ordinances

The City's zoning ordinances are a major force in shaping the density of and types of land uses found in Los Angeles. Zoning regulations can be used to support low impact development efforts by promoting an even distribution of open space, parks and agricultural land throughout the city. Additionally, zoning can be used to encourage compact and infill development in central city areas, preventing the growth of new developments on open lands.



1150 South Olive Street in downtown Los Angeles

General Plan, Community Plans & Specific Plans

The **General Plan**, created by the Department of City Planning, is the major policy document that informs planning and development decisions in the City of Los Angeles. All zoning ordinances must match the policies put forth in the General Plan. The General Plan is divided into a number of "elements" to address specific issues. The elements most relevant to low impact development include the Land Use Element, Conservation Element (last updated in 2001)[45], Open Space Element (updated 1973)[46] and Transportation Element (updated 1999).[47] [48] Unfortunately many of these elements are outdated and their policies do not adequately address current environmental concerns. Although efforts are underway to update the plans, completion of each element update takes a few years.

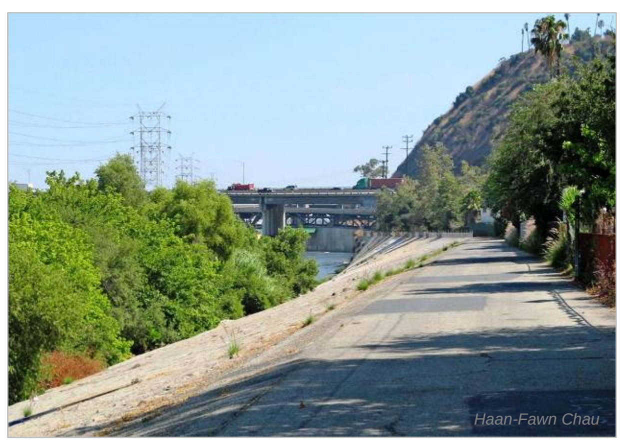
The Land Use Element is the largest element in the General Plan. It is actually comprised of thirty-five different **Community Plans** which address the particular needs and character of each area. On an even smaller scale, there are some neighborhoods that have their own **Specific Plans** which are tailored to very local conditions. Specific Plans are only created by the planning department on an as-needed-basis, usually when an area undergoing rapid changes could benefit from having more guidance than what is offered by the Community Plan.[49]

The General Plan (and its elements), Community Plans, and Specific Plans all offer opportunities to institutionalize water management and environmental protection by incorporating LID strategies into planning policies. As Community Plans are rewritten and new Specific Plans are developed, LID could become a standard component.

L.A. River Rivitalization Master Plan

The Los Angeles River Revitalization Master Plan (LARRMP) was completed in 2007.[50] Its recommendations provide "a framework for restoring the River's ecological function and for transforming it into a valuable, celebrated resource for residents and visitors to the City."[51] In the chapter titled "Revitalize the River," most of the goals and recommendations directly support low impact development. Some of these items include:

- Identify opportunities for peak flood storage outside the river channel.
- Emphasize "green infrastructure" improvements.
- Create landscape-based water quality treatment.
- Create "green strips" to treat stormwater runoff from streets.
- Create a continuous riparian corridor.



The Los Angeles River near Steelhead Park

The LARRMP is a policy document that presents a long-range vision and conceptual plan that identifies important revitalization strategies.

L.A. River Improvement Overlay District *(proposed)*

The proposed Los Angeles River Improvement Overlay District (LA RIO) was created to implement recommendations made in the LARRMP.[52] If enacted by ordinance, the LA RIO would be "a special use district that requires new projects to achieve points in three design categories: Watershed, Urban Design, and Mobility." The district would reach about ½ mile on either side of the L.A. River and would include all neighborhoods directly adjacent to the river. All new developments and significant redevelopments would have to meet LA RIO design guidelines.

Enacting the LA RIO would support low impact development by requiring developers to incorporate green infrastructure into their projects. Examples inlcude bioswales, bioretention ponds, green roofs, high efficiency irrigation systems, porous pavement and native plants.

Integrated Resources Plan

The City of Los Angeles' Integrated Resources Plan (IRP) is a multidisciplinary, cross-departmental effort to integrate the planning of three interdependent water systems: wastewater, recycled water and stormwater.[53] The IRP has worked collaboratively with community stakeholders to address the many water supply, pollution, and management challenges that face the Los Angeles area. Some of the strategies include optimizing the use of existing water infrastructure, increasing water conservation and reuse, and improving the management of dry and wet weather runoff using strategies such as better stormwater treatment infrastructure and low impact development-type projects.

Water Quality Compliance Master Plan

In 2007, the City of Los Angeles' Energy and the Environment/AdHoc River Committee filed a Motion directing the Bureau of Sanitation to create a Water Quality Compliance Master Plan (WQCMP) that outlines a strategy for the City to achieve Clean Water Act standards as well as compliance with all urban runoff regulations and mandates.[54] Some of the principles followed by the WQCMP that support low impact development include:[55]

- Identify all pollutants of concern in the City by type and location, including watershed or water body;
- Prioritize polluted areas within the City and create a compliance timetable;
- Identify strategies — such as on-site retention/infltration, structural best management practices, regional multi-use benefit projects (including the identification of potential sites for such projects), and non-structural educational and regulatory measures (including ordinance changes to encourage on-site infiltration) for the City to meet Clean Water Act standards by pollutant and by water body or watershed;

- Identify water quality data gaps including those that need to be filled in order to determine if the City is in full compliance with water quality requirements in the Los Angeles County stormwater permit and applicable TMDLs; and
- The proposed Master Plan will integrate existing efforts already underway such as the Integrated Resources Plan, Integrated Regional Water Management Plan, the Draft Los Angeles River Revitalization Master Plan, and other relevant watershed management plans, and will be developed in partnership with stakeholders from the public, environmental groups, and regulators including the Los Angeles Regional Water Quality Control Board and local municipalities.
- Include public workshops to seek input from not only from the above stakeholders, but also from the general public.

Endnotes

[1] U.S. Environmental Protection Agency. *National Pollutant Discharge Elimination System (NPDES).* Accessed on 8/11/08, http://cfpub.epa.gov/npdes

[2] U.S. Environmental Protection Agency. *National Pollutant Discharge Elimination System (NPDES).* Accessed on 8/11/08, http://cfpub.epa.gov/npdes

[3] U.S. Environmental Protection Agency. *Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s).* Accessed on 8/11/08, http://cfpub.epa.gov/npdes/stormwater/munic.cfm

[4] Gentile, Laura, John Tinger, John Kosco, Wes Ganter, and James Collins. "Storm Water Phase I MS4 Permitting: Writing More Effective, Measurable Permits." Presented at the National Conference on Urban Stormwater: Enhancing Programs at the Local Level, February 17-20, 2003. Accessed on 8/11/08 from U.S. Environmental Protection Agency, http://www.epa.gov/owow/nps/natlstormwater03/13Gentile.pdf

[5] "A Review Of Low Impact Development Policies: Removing Institutional Barriers to Adoption," December 2007. Commissioned by California State Water Resources Control Board Stormwater Program and The Water Board Academy. Prepared by the Low Impact Development Center. Accessed on 8/1/08, http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/docs/ca_lid_policy_review.pdf

[6] California State Water Resources Control Board. "State Water Resources Control Board (SWRCB) Order No. 99 - 08 – DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRS) For Discharges Of Storm Water Runoff Associated With Construction Activity." Page 18 of this portion of the document/page 62 of entire PDF. Accessed on 2/8/09, http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/finalconstpermit.pdf

[7] "A Review Of Low Impact Development Policies: Removing Institutional Barriers to Adoption," December 2007. Commissioned by California State Water Resources Control Board Stormwater Program and The Water Board Academy. Prepared by the Low Impact Development Center. Accessed on 8/1/08, http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/docs/ca_lid_policy_review.pdf

[8] ibid.

[9] California State Water Resources Control Board. *Stormwater Program: Construction Stormwater Program.* Accessed on 2/8/09, http://www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml

[10] U.S. Department of Energy. *Porter-Cologne Water Quality Control Act*. Accessed on 8/111/08, http://www.etec.energy.gov/Regulation/Porter-Cologne-Water-Quality-Control-Act.html

[11] "A Review Of Low Impact Development Policies: Removing Institutional Barriers to Adoption," December 2007. Commissioned by California State Water Resources Control Board Stormwater Program and The Water Board Academy. Prepared by the Low Impact Development Center. Accessed on 8/1/08, http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/docs/ca_lid_policy_review.pdf

[12] ibid.
[13] ibid.

[14] Email message from Simon Eching of the California Department of Water Resources, Office of Water Use Efficiency Transfers. January 14, 2009.

[15] State of California Department of Water Resources, Office of Water Use and Efficiency Transfers. *Updated Model Water Efficient Landscape Ordinance AB 1881.* Accessed on 1/15/09. http://www.owue.water.ca.gov/landscape/ord/updatedOrd.cfm/

[16] State of California Department of Water Resources, Office of Water Use and Efficiency Transfers. "Modified Text of Proposed Regulation," California Code of Regulations Title 23, Sections 490 - 495 regarding the Model Water Efficient Landscape Ordinance. November 26, 2008. Accessed on 1/15/09, http://www.owue.water.ca.gov/docs/Modified_Text_of_Proposed_Regulation.pdf

[17] LandscapeOnline.com. *California Water Ordinance Update.* Accessed on 8/22/08, http://www.landscapeonline.com/research/article/10189

[18] State of California Department of Water Resources, Office of Water Use and Efficiency Transfers. "Modified Text of Proposed Regulation," California Code of Regulations Title 23, Sections 490 - 495 regarding the Model Water Efficient Landscape Ordinance. November 26, 2008. Accessed on 1/15/09, http://www.owue.water.ca.gov/docs/Modified_Text_of_Proposed_Regulation.pdf

[19] County of Los Angeles Stormwater Ordinance. "Title 12, Chapter 12.80 - Stormwater and Runoff Pollution Control." Accessed on 2/1/09, http://ordlink.com/codes/lacounty/_DATA/TITLE12/Chapter_12_80_STORMWATER_AND_R.html

[20] State of California, California Regional Water Quality Control Board, Los Angeles Region. "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach." Order No. 01-182, NPDES Permit No. CAS004001. December 13, 2001. (Also known as the L.A. County Stormwater Permit SUSMP standards.)

[21] ibid.

[22] California State Water Resources Control Board. Letter from Michael A.M. Lauffer, Office of Chief of Counsel, to Dorothy Rice, Executive Director. July 16, 2008. Subject: "Cities of Arcadia, et al. v. State Water Resources Control Board, et al.,

(Super. Ct. Orange County, 2007, No. 06cco2974): Impact of peremptory writ of mandate on enrollments under the general industrial and general construction storm water permits."

[23] Pierson, David. "Beach pollution protections voided; building permits stalled." *Los Angeles Times*, July 18, 2008.

[24] Heal the Bay. Online News: *L.A. County Takes a Major Leap in Protecting Water Quality,* October 10, 2008. Accessed on 1/5/09, http://www.healthebay.org/news/2008/10-07_LACounty-LID/default.asp

[25] County of Los Angeles. "County of Los Angeles Low Impact Development Standards Manual," January 2009. Accessed on 1/10/09, http://planning.lacounty.gov/assets/upl/project/green_la-county-lid-manual.pdf

[26] County of Los Angeles Green Building Program, Department of Regional Planning and Department of Public Works. "Green Building and Sustainability Guidelines for the County of Los Angeles," 2008 Edition. Accessed on 1/10/09, http://planning.lacounty.gov/assets/upl/project/green_20080507-rpc-attachment-6.pdf

[27] County of Los Angeles, Green Building Program. *Drought-Tolerant Plant List.* Accessed on 1/10/09, http://planning.lacounty.gov/assets/upl/project/green_drought-tolerant-plants.pdf

[28] County of Los Angeles. "Ordinances for Green Building, Low Impact Development and Drought-Tolerant Landscaping," November 14, 2008. Accessed on 12/15/08. http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf

[29] ibid.
[30] ibid.
[31] ibid.

[32] County of Los Angeles, Department of Regional Planning. *Special Projects: Green Building Program.* Accessed on 7/17/08, http://planning.lacounty.gov/spGreenBuildingProgram.htm

[33] City of Los Angeles, Stormwater Program. *History.* Accessed on 8/12/08, http://www.lastormwater.org/Siteorg/program/history.htm

[34] Heal the Bay. Online News: *L.A. County Takes a Major Leap in Protecting Water Quality,* October 10, 2008. Accessed on 1/5/09, http://www.healthebay.org/news/2008/10-07_LACounty-LID/default.asp

[35] Sonenshein, Raphael J. *Los Angeles: Structure of a City Government,* p.77. (2006) Published by the League of Women Voters of Los Angeles.

[36] Daniels, Paula. (City of Los Angeles, Board of Public Works). "Green Streets LA" presentation. Accessed July 2008 from the Local Government Commission website, http://water.lgc.org/water-workshops/la-workshop/Green_Streets_Daniels.pdf/view

[37] Cassidy, Arly, Josh Newell and Jennifer Wolch. "Transforming Alleys into Green Infrastructure for Los Angeles," June 2008. USC Center for Sustainable Cities. Page 5. Accessed July 2008, http://college.usc.edu/geography/ESPE/documents/alleyreport_final_reduced.pdf

[38] City of Los Angeles, Million Trees LA. *Frequently Asked Questions.* Accessed on 8/12/08, http://www.milliontreesla.org/mtabout8.htm

[39] Conversation with Edith Ben-Horin, T.R.E.E.S. Project Associate, from TreePeople (Beverly Hills, CA). August 27, 2008.

[40] City of Los Angeles, Department of City Planning. "Building a Green Los Angeles: Framework for the City's Green Building Program," May 2008. Accessed on 8/13/08, http://cityplanning.lacity.org/code_studies/GreenLa/Brochure.pdf

[41] U.S. Green Building Council. "LEED® for New Construction & Major Renovations," Version 2.2, October 2005. Accessed on 8/6/08, http://www.usgbc.org/ShowFile.aspx?DocumentID=1095

[42] City of Los Angeles, Department of City Planning. "Los Angeles City Planning Department Recommendation Report." Report to the City Planning Commission, February 10, 2005. Case No: CPC-1992-0043-CA, CEQA: ENV-2003-7106-CE. Accessed on 8/6/08, http://cityplanning.lacity.org/Code_Studies/Other/landscape.pdf

[43] City of Los Angeles, Department of City Planning, Office of Zoning Administration. "City of Los Angeles Landscape Ordinance." Ordinance No. 170,978. Effective May 12, 1996, Operational July 12, 1996 (as amended through April 10, 2005). Accessed 8/7/08, http://cityplanning.lacity.org/Forms_Procedures/landsc%20guidelines%204-05.pdf

[44] City of Los Angeles. Draft memo from Paula Daniels, Chair, Stream Protection Task Force. "Re: Proposed Stream Protection Ordinance." October 3, 2007.

[45] City of Los Angeles, Department of City Planning. "Conservation Element of The City of Los Angeles General Plan." City Plan Case No. 2001-0413-GPA. Council File No. 01-1094. Adopted by the City Council September 26, 2001. Approved by the City Planning Commission March 10, 2001. Accessed on 8/13/08, http://cityplanning.lacity.org/cwd/gnlpln/consvelt.pdf

[46] City of Los Angeles, Department of City Planning. "Open Space Plan." June 1973. City Plan Case No. 24533.

[47] City of Los Angeles, Department of City Planning. "Transportation Element of the General Plan." Adopted my City Council on September 8, 1999. Approved by City Planning Commission July 24, 1997. Accessed on 8/13/08, http://cityplanning.lacity.org/cwd/gnlpln/transelt/index.htm

[48] City of Los Angeles, Department of City Planning. *General Plan Elements.* Accessed on 8/13/08, http://cityplanning.lacity.org

[49] Conversation with Bryan Lobel, City of Los Angeles, Department of City Planning. August 13, 2008.

[50] City of Los Angeles, Los Angeles River Revitalization Master Plan website. *Objectives of the Master Plan: Project Background & Purpose*. Accessed 8/17/09, http://www.lariverrmp.org/Background/master_plan.htm

[51] City of Los Angeles. Department of Public Works, Bureau of Engineering. *Los Angeles River Revitalization Master Plan.* p. 1-2. April 2007. Available at http://www.lariverrmp.org/CommunityOutreach/masterplan_download.htm

[52] City of Los Angeles, Department of City Planning. "RIO Fact Sheet: River Improvement Overlay District," July 2007. Accessed on 8/19/08, http://cityplanning.lacity.org/Code_Studies/Rioproject/factsheet.pdf

[53] City of Los Angeles. Department of Public Works, Bureau of Sanitation. "Integrated Resources Plan (IRP): A New Strategy for LA's Water Infrastructure—Information Sheet," January 26, 2006. Accessed 1/31/09, http://www.lacity.org/SAN/irp/documents/factsheet012006.pdf

[54] City of Los Angeles. Department of Public Works, Bureau of Sanitation. *Water Quality Compliance Master Plan.* Accessed on 1/31/09, http://www.lastormwater.org/siteorg/general/WQCMP/intro.htm

[55] The text from this description was taken from the "Water Quality Compliance Master Plan" page of the City of Los Angeles Stormwater Program website. http://www.lastormwater.org/siteorg/general/WQCMP/intro.htm (See previous citation.)

[8] Strategies to Codify Low Impact Development and Green Infrastructure

The Benefits of an Ordinance

As described in Chapter 4, low impact development strategies could help the City of Los Angeles tackle a range of urban issues, from stormwater runoff to climate change to green jobs. To reap these benefits, the City's best approach may be to enact a low impact development (LID) ordinance. Chapter 7 details a number of stormwater and green infrastructure regulations, policies and programs that already exist at the federal, state, county and city levels. While these items touch on some low impact development principles, the City still lacks a comprehensive, enforceable law that can be used to make LID a common practice in Los Angeles.

The two greatest advantages to enacting a LID ordinance—as opposed to relying only on LID policies---are (1) enforcement, and (2) long-term reliability. While enacting LID policies (in the General Plan, for instance) may be an important step toward widespread LID implementation, a complementary city ordinance can ensure that LID practices are enforceable by the rule of law and more broadly applicable. Additionally, unlike the L.A. County Municipal NPDES Stormwater Permit which needs to be reissued every five years, city ordinances are a permanent part of the municipal code and can only be reversed with legislative action by the city council.

Recent Challenges to Watershed Protection

Even with federal, state and county water protection regulations, there can be court-ordered changes, and sometimes even reversals. Two recent examples illustrate just how precarious the legal status of watershed protection and stormwater management can be in Los Angeles.

First, on June 4, 2008 the Army Corps of Engineers determined that only two small sections of the Los Angeles River—totaling

Benefits of a LID Ordinance

Two greatest advantages to enacting ordinances, as opposed to relying exclusively on policies:

1. enforcement
2. long-term reliability

Right now, standards from the L.A. County Stormwater Permit's Standard Urban Stormwater Mitigation Plan (SUSMP) are the closest that Los Angeles has to a LID ordinance. However, SUSMP standards are subject to revision and do not yet comprehensively require all the elements of a low impact development strategy.

Alternatives to a City LID Ordinance

1. Meet SUSMP requirements using LID standards
2. Revise Landscape Ordinance to include LID standards
3. Revise Green Building Ordinance to include LID standards
4. Rely on LID planning policies instead of ordinances
5. Combined ordinance and incentive structure
6. Enacting LID ordinance after voluntary pilot phase

8% of its length—qualified as “traditional navigable waters” of the United States.[1 2] This could have an impact on water quality because only navigable waters of the United States are protected under the federal Clean Water Act.

A driveway that allows for infiltration (Los Angeles)

A second example of a challenge to watershed protection occurred one month later on July 2, 2008. In the case of *Cities of Arcadia, et al. v. State Water Resources Control Board, et al.*, the Orange County Superior Court concluded that the Los Angeles Regional Water Quality Control Board had not properly “analyzed the reasonableness of its stormwater quality control standards,” especially with regards to their economic impacts.[3] This ruling directly challenges the validity of NPDES stormwater pollution controls under the Clean Water Act and the accompanying SUSMP standards in Los Angeles and Ventura counties.[4]

If the City of Los Angeles were to codify water protection standards at the *local* level, it would provide some leadership and assurance against unpredictable shifts in federal, state and county regulations.

Alternatives to a Stand-Alone LID Ordinance

A comprehensive low impact development ordinance would be the most effective way to implement LID strategies on a wide scale. However, enacting major new ordinances can take a lot of time and political will. There are a few alternative ways that LID could be implemented on a smaller scale. Also, the following ideas could be used as short-term LID solutions while the City works on developing a full-scale LID ordinance or program.

Alternative #1:
Meet SUSMP Requirements Using LID Standards

The City could require all projects that fall under the L.A. County Stormwater Permit’s SUSMP rules to also meet strict LID standards defined by the City.

<u>*Drawbacks:*</u> (a) SUSMP only applies to major new developments and redevelopments, not existing buildings and infrastructure. (b) The stormwater permit must be renewed every five years, and there is no certainty as to the level of protection in future versions.

Alternative #2
Revise Landscape Ordinance to Include LID Standards

The City's Landscape Ordinance could be revised to include more low impact development strategies. As mentioned in Chapter 7, the State has created a Model Water Efficient Landscape Ordinance with a few LID elements which will apply only to new and major redevelopments.[5] The City will be required to match or exceed the State's landscape ordinance by 2010.

Additionally, a points-based system similar to the U.S. Green Building Council's LEED standards could be initiated for landscapes in the city. The Sustainable Sites Initiative,[6] organized by landscape architects, is currently developing a system to certify environmentally-friendly landscapes and site design.

<ins>*Drawbacks:*</ins> (a) Many effective LID techniques fall outside the purview of a landscape ordinance (i.e. green roofs, porous pavement, water storage cisterns, curb cuts leading to swales). (b) A landscape ordinance would miss large areas of the city because it would not apply to infrastructure such as streets, sidewalks, alleys and parks. (c) The proposed State standards do little to address existing landscapes. (d) The proposed State standards recommend but do not require the use of native and drought tolerant plants.

Demonstrating water infiltration through pervious concrete (left) and porous asphalt (right). Parking lot at Villanova University, Pennsylvania. *EPA / Abby Hall*

Alternative #3
Revise Green Building Ordinance to Include LID Strategies

Currently, it is possible for developers to comply with the City's Green Building Ordinance without implementing stormwater BMPs and water efficiency measures. The ordinance could be revised to require buildings to achieve specific points related to low impact development in the "Sustainable Sites" and "Water Efficiency" categories of LEED green building standards.

<ins>*Drawbacks:*</ins> (a) Stormwater management is an optional, but not required, part of LEED certification and only counts for one out of 26 points necessary for certification.[7] (b) Water efficiency points are also optional, and only two points relate to LID strategies.[8] (c) The Green Building Ordinance does not apply to existing buildings and only covers major redevelopments. (d) The Green Building Ordinance does not apply to infrastructure such as streets, sidewalks, alleys and parks.

Alternative #4
Rely on LID Planning Policies Instead of Ordinances

Adopting policies can sometimes be more politically feasible for the City than adopting ordinances. City-wide goals and policies for low impact development could be added to the General Plan, possibly in the conservation element. Then, as the city's 35 community plans are updated one by one, LID strategies can be tailored to each area's potential to manifest LID principles. (i.e. Some areas have very permeable soils and therefore can infiltrate more water than others. Conversely, some locations may be too densely developed to rely heavily on infiltration.)

Even if the City decides to move forward with developing a LID ordinance, LID policies could be adopted first. These policies will then provide the foundation and information to support the passage of a LID ordinance.

<u>*Drawbacks:*</u> (a) It takes a long time to update all 35 community plans, so LID implementation would happen very slowly. (b) Policies are not enforceable in the same way as ordinances. (c) Policies can be changed without exhaustive public review, making a LID policy potentially more vulnerable than an ordinance. (d) Policies are more subject to alteration with a change in executive leadership.

Alternative #5
Combined Ordinance and Incentive Program

The City could establish a low impact development program that relies on a combination of a LID ordinance and a LID incentive structure. First, the ordinance would require that new developments and redevelopments use LID techniques. Then, to promote LID for existing developments, the City would create a rebate program to provide some reimbursement for people who choose to install low impact development BMPs on their properties.

This combined strategy (ordinance + incentive program) could use individualized parcel stormwater assessments, a concept which is described in greater detail in Chapter 6. Assessments would be based on the amount of impervious surface found on a property, and rebates could be offered for people who install LID BMPs to increase on-site permeability. To make this work, the assessment fees would have to be high enough to motivate people to install LID projects that qualify for a rebate.

Infiltration swale for a supermarket parking lot.
7676 Firestone Blvd., Downey, CA.

Alternative #6
Enacting LID Ordinance After Voluntary Pilot Phase

Because the widespread use of low impact development strategies is a relatively new idea for Los Angeles, the City may want to begin with a voluntary, one-year LID program that serves as an instructive pilot phase. To ensure enough participation during this test period, the City could offer incentives such as rebates for the installation of LID best management practices. At the end of the year, the City would revise and codify the LID ordinance, making it mandatory for property owners to follow. However, there is a drawback to relying on a voluntary program to implement low impact development: it would take a long time for the widespread use of LID to occur, and due recent droughts throughout the state, the City of Los Angeles has an imminent need to conserve water now.

Endnotes

[1] Kerr, Mary. *Press Release: Chairman Oberstar and Waxman Demand Answers From Corps.* August 7, 2008. U.S. House of Representatives, 111th Congress, Transportation and Infrastructure Committee. Accessed on 8/11/08, http://transportation.house.gov/News/PRArticle.aspx?NewsID=728

[2] Hopkins, Ed and Judy Anderson. "Clean Water Act in Jeopardy." *Southern Sierran* newsletter, p.1. August 2008, Volume 64, No. 8. Published by the Angeles Chapter of the Sierra Club.

[3] California State Water Resources Control Board. Letter from Michael A.M. Lauffer, Office of Chief of Counsel, to Dorothy Rice, Executive Director. July 16, 2008. Subject: "Cities of Arcadia, et al. v. State Water Resources Control Board, et al., (Super. Ct. Orange County, 2007, No. 06cco2974): Impact of peremptory writ of mandate on enrollments under the general industrial and general construction storm water permits."

[4] Pierson, David. "Beach pollution protections voided; building permits stalled." *Los Angeles Times,* July 18, 2008.

[5] State of California Department of Water Resources, Office of Water Use and Efficiency Transfers. *Updated Model Water Efficient Landscape Ordinance AB 1881.* Accessed on 1/15/09. http://www.owue.water.ca.gov/landscape/ord/updatedOrd.cfm/

[6] The Sustainable Sites Initiative homepage. Accessed on 9/22/08, http://www.sustainablesites.org/index.html

[7] The U.S. Green Building Council, Leadership in Energy & Environmental Design (LEED). "Green Building Rating System for New Construction & Major Renovations (LEED-NC), Version 2.1," p.11. November 2002, revised March 14, 2003. Accessed on 7/31/08, http://www.usgbc.org/Docs/LEEDdocs/LEED_RS_v2-1.pdf

[8] The U.S. Green Building Council, Leadership in Energy & Environmental Design (LEED). "Green Building Rating System for New Construction & Major Renovations (LEED-NC), Version 2.1," p.16–17. November 2002, revised March 14, 2003. Accessed on 7/31/08, http://www.usgbc.org/Docs/LEEDdocs/LEED_RS_v2-1.pdf

[9] Defining the Scope of a LID Strategy for Los Angeles

This chapter sets forth possibilities for the scope of a low impact development (LID) strategy for the City of Los Angeles. Since the city could greatly benefit from implementing LID on a wide scale (see Chapter 4), the sections below assume that it would take a comprehensive, thorough approach to LID.

1150 S. Olive Street, Los Angeles

To Whom Would LID Apply?

Currently, most LID-type requirements in Los Angeles apply only to new developments or major redevelopments; they do not address the enormous mass of existing development in the city. Additionally, regulations tend to focus on individual sites and parcels of land, not the connecting infrastructure of roads, sidewalks, parks and alleys. Therefore, a comprehensive LID program would encompass all of the following:

- **Government & public infrastructure:** The City government controls large portions of land, buildings, streets, parks and infrastructure throughout Los Angeles. *The Green Solutions Project* report written by Community Conservancy International found that close to 40% of L.A. County's urban runoff needs could be met by implementing LID on publicly-owned lands.[1] Additionally, more than half of Los Angeles is covered by impermeable surfaces.[2] Thus, integrating public green spaces into the water management network and changing the City's street paving and construction practices could have very positive effects.
- **Private residences:** Private homes and apartment buildings cover a sizeable proportion Los Angeles, and they often have lawns and gardens which are prime candidates for LID infiltration projects. Additionally, lawns are a major source of pollution because nutrients and fertilizers flow into the storm drain system. Infiltration would reduce these impacts.
- **Commercial/retail:** Commercial and retail developments often have very large, paved surfaces (such as parking lots) that produce contaminated runoff. They provide an opportunity to infiltrate using permeable pavement and bioswales.
- **Industrial:** Even though many industrial buildings are already subject to pollution controls, implementing LID practices in areas that do not have serious contamination issues would also

help to recharge groundwater supply. Like commercial properties, industrial lots often have large, paved surfaces that could be converted to infiltration zones.

Encompassing New and Existing Development

Applying LID requirements to all sectors and to both new and *existing* developments of all sizes would move beyond the limited scope of L.A. County's current SUSMP stormwater management standards and the City's Green Building Ordinance. Again, this is important because **low impact development practices are most effective when distributed throughout the watershed.** As highlighted in Chapter 4, *widespread* implementation of low impact development on public lands could address 40% of L.A. County's polluted runoff needs,[3] and so one could hypothesize that extending LID practices to private lands would greatly increase this percentage. Additionally, it has been found that implementing LID on suitable public and private properties could reduce the amount of water imported by 74,600–152,500 acre-feet per year.[4] Thus, to achieve wide-scale benefits, existing development should be included in the City's strategy for LID.

Since existing developments are currently exempt from the LID measures found in the County's SUSMP standards and the City's green building and landscape ordinances, there may also be some resistance to including existing developments in a mandated low impact development strategy. **Introducing a city-wide LID rebate program for existing development could be a successful way to address these concerns and provide a financial incentive to install green infrastructure features on these properties.** The City could develop a rebate structure that allows property owners to recoup some (or all) of their stormwater fees by using low impact development BMPs such as rain gardens, bioswales, cisterns and even permeable pavement.

In very densely developed areas, it may be difficult to infiltrate or capture all runoff on-site, so the city may consider using in-lieu fees to allow developers to compensate for any shortfalls. The in-lieu fees could then be used to install additional LID projects nearby. (See Chapter 6 for a detailed discussion of in-lieu fees.)

A 2008 publication by the EPA, titled *"Managing Wet Weather with Green Infrastructure: Municipal Handbook - Green Infrastructure Retrofit Policies,"* contains more information and case studies on this topic. It can be accessed at http://www.epa.gov/npdes/pubs/gi_munichandbook_retrofits.pdf.

Brownfields and LID

Los Angeles' brownfields provide good opportunities for infill redevelopment. However, depending upon the characteristics of the site, infiltration BMPs may not always be appropriate. Factors to consider when developing brownfields include the level and type of contamination, how much remediation has already been done, the type of soil in the area, the depth of groundwater, and the rates and direction of hydrologic flow on-site. Many brownfield sites may be better served by mechanical and chemical treatment methods instead of infiltration. However, brownfields could still be part of a groundwater recharge system. Water from contaminated sites could be captured and cleaned, and then be piped to a recharge location outside of the contaminated area.

The City of Emeryville, CA has been particularly successful in using low impact development and green infrastructure techniques for brownfields redevelopment.[5] The city's handbook, *Stormwater Guidelines for Dense, Green Redevelopment,* details some of the LID options that developers can use for infill sites.[6] Due to soil contamination, the Emeryville brownfields projects do not infiltrate stormwater into the aquifers. Instead, stormwater is captured for filtration and/or reuse. Vegetated detention basins and swales use plants to remove pollutants from stormwater (bioremediation).

Reaching Beyond Current Performance Standards

Chapter 7 noted that the L.A. County Stormwater Permit's "Standard Urban Stormwater Mitigation Plan" (SUSMP) contains the most important LID-related infiltration and stormwater capture requirements that apply to the City of Los Angeles. **While SUSMP standards are the closest that Los Angeles has to a LID ordinance, they still fall short of a comprehensive low impact development strategy for a number of reasons.**

A clogged catch basin in Los Angeles.

For instance, SUSMP does not require native and/or drought-tolerant plants for landscape BMPs[7]. If developers install water-thirsty plants requiring large amounts of irrigation during the dry season, this could have the unintended consequence of exacerbating L.A.'s water conservation issues. And as mentioned above, the standards only apply to major new developments and redevelopments, not existing developments. (See Chapter 7 for more SUSMP information.)

Moreover, it is worth noting that SUSMP is especially geared towards dealing with the pollution in the first flush of a storm, and was not designed to encompass concerns about groundwater recharge. Given Los Angeles' concern about long-term water supplies, the City may want to adopt *even more* ambitious performance standards than SUSMP. (Current SUSMP standards require that a project capture, infiltrate or treat all of the runoff from an 85th percentile storm, which equivalent to a ¾" storm.)

Setting New Performance Standards

Some basic questions to consider when setting new performance standards for low impact development are listed below. A more extensive list can be found at the beginning of the next chapter.

- Should LID performance standards vary with soil type and the character of the local water table?
- LID attempts to restore pre-development hydrology and flows, but these have changed quite a bit over history. How far back in time should we look?
- Should LID performance standards vary with building size or type?
- Should there be different expectations for dense neighborhoods vs. low density neighborhoods?
- How should the performance of a LID program or project be measured?
- On what scale or level should LID performance be measured—by parcel, block, neighborhood or watershed?
- What will be measured? Water quality parameters, water flow from a site, etc.
- Who will be responsible for monitoring?

Contents of a LID Ordinance

If the City of Los Angeles were to adopt a low impact development ordinance, what would it contain? LID ordinances passed by other municipalities provide good examples, though the City may want to adapt them to suit the unique needs and goals of Los Angeles. Of particular interest is the Low Impact Development Ordinance recently passed by the County of Los Angeles in October 2008 as part of its landmark green building program.[8] Chapters 5 & 7 contain more detailed descriptions and analysis of the County's LID Ordinance, and the text of the ordinance can be found in Appendix II.

Rain chains guide water into rocky infiltration swales in Seattle's High Point neighborhood.

The components of a LID ordinance for the City of Los Angeles should include:[9 10]

- The purpose of the ordinance
- Definitions of important terminology
- To what and whom the ordinance applies
- LID standards for the pre-development (site planning) phase and construction phase
- LID performance standards for specific types of properties
- Whether performance standards are prescriptive (requiring the use of specific BMPs) or flexible (using BMPs preferred by the developer to meet performance thresholds)
- The prioritization of BMPs to place emphasis on infiltration into aquifers (see Chapter 3)
- Tying LID standards to a manual of LID standards for the City of Los Angeles (see next section)

- Tying LID standards to a list of recommended native and/or drought tolerant plants suited to the local habitats and climate
- Stream and riparian habitat protection measures
- Any incentives offered by the City to encourage property owners to install LID measures
- LID site plan review and approval process
- Requirements for continued maintenance and operation of LID best management practices
- Monitoring and evaluating the performance of LID programs and projects
- Adapting the LID standards or ordinance to reflect the knowledge gained from monitoring program.

Developing a LID Manual for Los Angeles

Every major municipal low impact development program has developed a technical manual to accompany its policies or ordinances. Particularly notable examples are from Prince George's County (MD), the Puget Sound region (WA), Emeryville (CA), Los Angeles County, San Diego County and the U.S. Department of Defense. Web links to all of these manuals can be found in Appendix I.

In general, LID manuals do the following:

- Explain the purpose of and principles behind low impact development
- Clarify the meaning and application of LID performance standards
- Describe site assessment, planning and design techniques
- Describe an array of LID best management practices (including advantages, drawbacks, cost considerations, and maintenance needs)
- Provide diagrams and plans for common BMPs
- Supply information on hydrologic flow modeling

If L.A. City were to create a low impact development manual, it would not have to start from scratch. Much of the material from L.A. County's new "Low Impact Development Manual," as well as its old 2002 "Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP)," can be applied to the needs of the City of Los Angeles.[11]

Endnotes

[1] Community Conservancy International. "The Green Solutions Project" report, March 2008. Executive Summary, p.ES-3. The report can be viewed at http://www.ccint.org/greensolution.html

[2] City of Los Angeles, Inter-Departmental Correspondence. May 21, 2008. "CF: 05-0752 Alternative Street Surfacing Materials." To: Energy and the Environment Committee, from: Department of Public Works and Environmental Affairs Department. This document can be accessed online at http://www.lacity.org/ead/greenbuilding/eadgreenbuilding298555988_10022008.pdf

[3] Community Conservancy International. "The Green Solutions Project" report, March 2008. Executive Summary, p.ES-3. The report can be viewed at http://www.ccint.org/greensolution.html

[4] *First source of information:* Beckman, David S. and Noah Garrison. "NRDC Comment on AB32 Scoping Plan Appendices Water Sector," August 11, 2008. Natural Resources Defense Council comments sent to the California Air Resources Board. *Second source of information:* Email message from Noah Garrison, Project Attorney at NRDC, on January 21, 2009. "LID Numbers for L.A. County."

[5] U.S. Environmental Protection Agency, Brownfields and Land Revitalization Program. "Case Studies for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas," April 2008. Accessed on 8/14/08, http://www.epa.gov/brownfields/publications/swcs0408.pdf

[6] City of Emeryville (CA), Planning and Building Department. "Stormwater Guidelines for Green, Dense Redevelopment," December 2005. Accessed on 1/5/09, http://www.ci.emeryville.ca.us/planning/pdf/stormwater_guidelines.pdf

[7] State of California, California Regional Water Quality Control Board, Los Angeles Region. "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach." Order No. 01-182, NPDES Permit No. CAS004001. December 13, 2001.

[8] Heal the Bay. Online News: *L.A. County Takes a Major Leap in Protecting Water Quality,* October 10, 2008. Accessed on 1/5/09, http://www.healthebay.org/news/2008/10-07_LACounty-LID/default.asp

[9] County of Los Angeles. "Ordinances for Green Building, Low Impact Development and Drought-Tolerant Landscaping," November 14, 2008. Accessed on 12/15/08. http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf

[10] Vermont League of Cities & Towns. "Model Low Impact Development Stormwater Management Bylaw," May 2008. Accessed on 7/21/08, http://resources.vlct.org/u/o_LID-secured.pdf

[11] County of Los Angeles, Department of Public Works. *Development Planning for Storm Water Management: A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP) - September 2002 Revision.* Accessed on 8/5/08, http://ladpw.org/wmd/NPDES/table_contents.cfm

[10] Considerations for LID Implementation

Low impact development (LID) offers promising strategies for the City of Los Angeles to significantly improve stormwater management, water supply and green space while reducing its impact on climate change and the environment in general. However, the city should consider the following challenges and issues before developing and implementing a comprehensive LID program.

Curb cut that directs water from the street into a bioswale. Voluntarily installed at 1100 S. Hope Street in downtown L.A.

Defining LID Goals & Standards

Some questions to consider when defining LID goals and standards include:

Determining goals:

- How much water should be infiltrated and/or captured? Should LID requirements be similar to current SUSMP standards or more ambitious?
- Should the City create a LID rebate program to encourage property owners to install more best management practices (BMPs)?
- LID attempts to restore pre-development hydrology and flows, but these have changed quite a bit over the city's history. How far back in time should we look?
- Our urban landscape is always changing, and it may be a challenge for LID projects to keep up with those changes. For example, if a low density area with plenty of LID BMPs starts changing to a high density area, would this change any of the fundamental LID infrastructure or strategies?

Defining standards:

- Should LID standards be performance-based (to allow for flexibility) or should they prescribe the use of specific LID best management practices?
- What methods should be used to measure the performance of a LID program or project?
- On what scale or level should LID performance goals be measured—by parcel, block, neighborhood or watershed?
- Should LID performance standards vary with soil type, the character of the local water table and the slope of the land?

- Should there be different expectations for dense neighborhoods vs. low density neighborhoods?
- Should LID performance standards vary with building size, type or purpose?

Balancing Smart Growth and Infiltration

Smart growth planning practices encourage compact development for a number of reasons: to reduce a city's environmental impact, to preserve open space, support access to public transportation, and improve walkability. Nonetheless, increased urban density can make it difficult or expensive to infiltrate on-site, especially if a building's footprint takes up the entire lot of land. How can the city encourage LID infiltration, but not at the expense of compact development?


Portland, OR
EPA / Abby Hall

Four options may help solve this dichotomy: (1) in-lieu fees, and (2) reduced parking requirements in exchange for the installation of low impact development BMPs,[1] (3) requiring that properties capture, filter and reuse runoff water instead of infiltrating it, and (4) setting LID infiltration goals on a larger, neighborhood scale instead of parcel-by-parcel.

In-Lieu Fees

In very densely developed areas, it may be difficult to infiltrate or capture all runoff on-site, so the city may consider using in-lieu fees to allow developers to compensate for any shortfalls. The in-lieu fees could then be used to install additional LID projects nearby.[2] The *advantages* of this system include that (1) it raises money for the City to pay for general LID implementation and maintenance projects, and (2) it creates some flexibility in how developers can decide to fulfill LID requirements. *Disadvantages* of this system include that (1) it may actually be more cost-effective and less burden for the City to require developers to install infiltration BMPs, and (2) by allowing property owners a way to avoid installing infiltration BMPs, the City runs the risk of having no LID infiltration BMPs at all in very dense neighborhoods.

If the City were to move forward with allowing in-lieu fees, the fees should go towards the installation of LID projects that are close to the original development sites that generated the fees. Also, the in-lieu-fees should not be used to build centralized treatment plants, as these would not fulfill the LID goals of enhancing natural drainage systems and managing stormwater on a local scale.

Exchanging Parking Requirements or Density Bonuses for LID BMPs

The City could use density bonuses or reduced parking requirements as incentives for installing low impact development features in highly urbanized areas. Both incentives increase the amount of space that can be built—a valuable opportunity for developers working in such areas.

As shown by the table on the right, parking facilities are very expensive to build, and City-mandated parking requirements can place major constraints on how developers can use their land.[3] In very dense portions of the city, exchanging parking spaces for effective, well-planned LID infiltration projects could prove to be a powerful economic incentive.[4]

Average Development Cost of Parking (excluding land)

Source: http://www.livableplaces.org/bpolicy/parking.html

Type of parking facility	Cost/space
Surface lot	$2,000
Multi-level above ground	$10,000
Subterranean	$20,000

Capture, Filtration & Reuse

The City could designate certain "densely developed areas" of the Los Angeles (such as downtown, where soils are not conducive to infiltration and basement width often extends under the sidewalk area), where it would allow developers to capture, filter and reuse water runoff from a property instead of infiltrating it into the ground. On-site treatment facilities could be used to remove pollutants from runoff. If the property has no way of reusing the filtered water, the City could allow it to connect to the storm drain system or direct its flow to another property for reuse.

Setting LID Goals at Neighborhood Level

Basing LID infiltration goals on larger areas—such as entire neighborhoods or watersheds instead of parcel-by-parcel—could allow some flexibility to deal with infiltration problems at an individual site while still achieving the City's overall infiltration goals. Making some concessions to accommodate compact growth could help prevent suburban sprawl, saving valuable open space from being developed. To successfully adhere to low impact development principles, the City would need to evaluate the amount of filtration and groundwater recharge that would be gained by preserving open space in comparison to requiring smaller infiltration zones in dense urban locations.

Administrative Challenges

Before implementing a low impact development program, the City would need to resolve a number of administrative challenges:

Administering a LID program:

- Which department would be responsible for LID implementation? A comprehensive LID program would probably require coordination between several departments.
- Will additional staff be needed to administer the LID program?

- To encourage innovative LID projects, the process for approving non-standard BMP designs should be streamlined.
- A plan to monitor adherence to LID standards and to tell whether property owners continue to maintain their low impact development BMPs should be developed.
- The LID program should be administered in a way that will not create an extra layer of bureaucracy for building plan checks.
- Possible increases in maintenance: porous pavements need to be vacuum-swept several times a year.

Resolving conflicts with LID:

- Some LID practices may conflict with building and safety codes. Historically, building and safety codes have aimed to direct water out to the storm drain as fast as possible—the opposite of what low impact development tries to accomplish. Also, there may be some building codes that restrict how water can be reused and what kinds of pavement can be used for fire lanes.
- Sometimes the City requires developers to change the slope of the site in a way that does not benefit low impact development. The City's grading requirements tend to favor the urban street grid and are not based on the land's natural topography.
- Hillside areas may not be conducive to infiltration due to the potential for soil subsidence, and may need to be exempted from LID.

A large cistern collects roof runoff from a commercial building in Chicago.

Other points of note:

- Potential private property issues: For LID to have a significant positive impact, it should be employed on private as well as public property. From an environmental standpoint, if a particular property has very little infiltration area but an adjacent property has plenty of space for infiltration, low impact development goals could be fulfilled by infiltrating the runoff from the first property on the second property. However, allowing one property to manage the other's runoff could cause some legal complications.
- A LID ordinance for the City of Los Angeles would not apply to the Los Angeles Unified School District (LAUSD), a major land holder. The school district is currently following county-wide SUSMP stormwater management standards because of political pressure. Moreover, LAUSD generally uses state architects to design their sites. Instead of using the LEED green building certification system run by the U.S. Green Building Council (which is the centerpiece of L.A.'s Green Building Ordinance), they use the CHPS program (Collaborative for High Performance Schools) which applies only to K-12 schools.

LID Readiness & Education

Low impact development will be a new concept to many. To properly implement a LID program, the City should take steps to ensure that there is an adequate support structure and professional knowledge base.

- How ready are we for LID change? City planning staff, engineers and street maintenance crews would need to learn about LID principles and standards.
- Are Los Angeles' architecture and landscape design professionals ready to design and install LID features? Local landscape architects may not have enough knowledge about ecology and native plants to implement LID techniques effectively. Making a landscape look attractive is very different from designing it to successfully perform stormwater management functions.
- Low impact development training should be offered to the landscape and gardening industry so that they can understand how to maintain landscape BMPs and smart irrigation systems.
- More trained professionals are needed to help monitor, collect data and analyze the effectiveness of LID projects in Los Angeles. They will be needed in both the government and private sectors.
- The people who evaluate LID programs and projects must have a thorough understanding of the biological and ecological calculations that go into LID.

Implementing LID Effectively

In order to effectively implement low impact development in Los Angeles, a number of points should be kept in mind:

- Site evaluation is very important to ensure that LID best management practices appropriate for the local drainage patterns are installed at optimal locations on a property.
- If the city's goal is to maximize groundwater recharge, then it must emphasize drought-tolerant plants. Planting additional water-thirsty species could actually increase the city's demand for water. Therefore, to fulfill the goal of increasing water supply while reducing demand, planting drought-tolerant plant and tree species is imperative.
- Infiltration and groundwater recharge is not necessarily optimal where the ground is composed of impenetrable clay, as the case in some areas of the city. In such areas, the emphasis should be placed on slowing and cleaning instead.
- Development companies must carefully plan the paths for their construction equipment in order to prevent the removal of topsoil and excess grading and compaction, all of which reduce the effectiveness of LID infiltration techniques.

LID Knowledge, Data and Evaluation

Since low impact development and green infrastructure programs are relatively new in the United States, the knowledge base is still developing. There is a need to gather information about LID projects in dry climates such as Los Angeles. The City can help fill these information gaps by considering the following:

Vegetated swale with curb cuts at a shopping center. 8500 Firestone Blvd., Downey, CA.

- Who will be responsible for monitoring and evaluating LID programs and projects? What will be measured? (Water quality parameters, water flow from a site, rate of infiltration, etc.) How does LID data compare to baseline data for conventional stormwater practices in Los Angeles?
- There is quite a bit of existing data on implementing LID in wet climates, but not enough for dry climates. There needs to be more test cases and studies specific to Southern California's climate, especially regarding effectiveness and costs of LID. The City may be able to cooperate with universities to accomplish this.
- The City could develop a methodology to quantify and assess the true value of low impact development strategies. It is important to account for all the economic, environmental and social benefits and costs when conducting a financial analysis of LID. Many analyses tend to focus only on capital costs, but when looking at the large-scale ecological picture, LID is often a more cost-effective strategy than conventional stormwater management. There is significant value created by nature's services, such as pollution removal by plants, potential flood waters absorbed by soil, and carbon sequestered by trees.
- The results of a cost-benefit analysis can also vary from site to site. For instance, the value of removing a certain amount of bacterial pollution may be worth more at one site than another. How could this be included in a comprehensive LID program?
- Some BMPs may have long-term issues with maintenance, so more test cases are needed to gather data on this topic.

Equity Issues

Implementing low impact development throughout Los Angeles may generate some concerns about equity issues in low-income areas. For instance, because dense neighborhoods have relatively small lots and are dominated by buildings and paved surfaces, there is little space to install LID infiltration BMPs. Therefore, drainage fees based solely on the percentage of impervious surface that covers a property may place a proportionately higher burden on dense neighborhoods. Since low-income neighborhoods are often located in very dense parts of the city, these residents could be subject to relatively high fees.

One way to ameliorate this problem would be to base drainage fees on the total square footage of a property's impervious surfaces. Since central-city properties and buildings tend to be more compact than suburban ones, this approach is more likely to result in lower fees per living unit for dense neighborhoods. The City may wish to explore other options, such as subsidies and rebates, to help ensure that low-income communities are not unfairly burdened by LID fees.

Endnotes

1 Conversation with Dr. W. Bowman Cutter (Assistant Professor, Department of Economics, Pomona College), 8/13/08.

2 ibid.

3 Shoup, Donald. "Graduated Density Zoning." *Zoning Practice*, January 2009, p. 2–7. Accessed on 1/20/09 from the University of California Los Angeles website, http://its.ucla.edu/shoup/GraduatedDensityZoning.pdf

4 Conversation with Dr. W. Bowman Cutter (Assistant Professor, Department of Economics, Pomona College), 8/13/08.

[11] Recommended Next Steps

This chapter recommends a number of steps that the City of Los Angeles can pursue to implement a more comprehensive low impact development (LID) and green infrastructure program. The recommendations are listed roughly in the order in which they should be accomplished. Additional background on these items can be found in Chapters 6–10.

Tree well near the intersection of Grand and 12th Streets in downtown Los Angeles.

Internal Review

1. Review low impact development strategy with the City's Green Team, Green Streets Committee and City Council committees.

Stakeholder Review

1. Determine which groups need to be involved with LID brainstorming, review and feedback: environmental groups, developers, architects, landscape architects, planners, civil engineers, community organizations, gardening industry, etc.

Analysis and Foundation Steps

1. Create a task force or implementation team for LID and green infrastructure.
2. Survey and analyze current policies, ordinances and standards to identify potential conflicts with LID and green infrastructure. Make recommendations for necessary changes. (See Chapters 7 & 10.) Engineering and building & safety standard plans, practices, and ordinances should be a top priority. Also check fire and flood ordinances and insurance maps for conflicts with LID.
3. Create a menu of best management practices (BMPs) appropriate for LID projects in Los Angeles. Place special focus on natural/biological BMPs.
4. Create design and engineering guidelines for LID best management practices. These standard plans will allow LID BMPs to be easily approved.
5. What can be done to make it easier to implement LID projects until we have sufficient cost-benefit information for our climate?
6. Examine questions regarding scope, applicability, and internal process & management. (See Chapters 9 & 10.)
7. Develop methodology for cost-benefit analysis to include capital costs AND a way to quantify nature's services.
8. Generate comprehensive cost-benefit estimates for implementing LID.

Testing & Evaluation

1. Identify potential LID and green infrastructure pilot projects to gather LID data for our area/climate.
2. Develop and implement pilot projects.
3. Collect and analyze data from pilot projects to help inform future LID efforts and to enhance our understanding of how LID can be implemented in dry climates.
4. Universities and nonprofit organizations may be good partners to help with identifying and designing projects, data collection and analysis.

Policy Development & Implementation

1. Develop a BMP manual for LID practices. Include list of drought-tolerant, native plants suitable for bioswales in our climate. It would be helpful to suggest: (1) BMPs for different climate/environmental conditions, and (2) BMPs that remove specific pollution constituents. (Northeast Trees is already working on a project that matches chemical constituents to appropriate BMPs.)
2. Create decision trees to help developers and the general public to understand what kinds of LID decisions need be made for each type of development. Decision trees should be made for new development, redevelopments and existing developments.
3. Integrate LID principles into the Conservation Element of the General Plan.
4. Integrate LID principles into a revised Landscape Ordinance, which the state requires every city to adopt by 2010. (See Chapter 7.)
5. Explore the feasibility of integrating LID into the Green Building Ordinance.
6. As the city's 35 community plans are updated, integrate LID principles into each plan. This will especially help to address land use issues as they relate to LID.
7. Create Green Streets design guidelines for incorporation into standard plans.
8. Review the need for a LID ordinance.
9. Develop a working group to draft a LID ordinance.

[12] Conclusion

Southern California was designed and built mostly in the 20th Century, and the prevailing idea at the time was to move water quickly and directly to the ocean. In the 21st Century, we have learned how to design our streets, sidewalks, and landscaping to soak up runoff through a more natural process, weaving the textures of nature into the fabric of the city. We have begun to capitalize on the valuable services that nature can offer us: capturing, cleaning, and storing stormwater.

Low impact development is an emerging and important international stormwater management trend. Nationwide research has proven that low impact development can be a cost effective solution to pressing problems pertaining to water quality and water supply, as well the other benefits noted in this paper, such as flood control, mitigation of climate change, and creation of more natural spaces. For instance, studies have shown that if runoff is directed over vegetated areas, or areas with other kinds of porous material, the process of soaking through the soil cleans up or treats the pollution naturally and recharges groundwater aquifers as well.

Urban runoff is the number one source of water pollution in Southern California. Research conducted in Los Angeles has found that the City can significantly increase its water supply, ameliorate climate change issues, and address of much of the pollution found in urban runoff by converting its paved areas from gray to green. Moreover, implementing low impact development will create new, local “green-collar” jobs through the development of a workforce trained to install and maintain green infrastructure features.

A curb cut that directs water from the street and sidewalk into a bioswale. 1100 S. Hope Street in downtown Los Angeles.

The LID principles become particularly crucial as climate change impacts to our environment produce changing weather patterns that are currently predicted to result in longer term drought conditions throughout California. Harvesting all available rainwater by the various methods shown in this paper is an important means of addressing this looming problem.

The City of Los Angeles is well underway toward implementing the principles of low impact development into its designs for streets, sidewalks and alleys, through its Green Streets and Green Alleys program. With over 6,500 miles of streets and 900 miles of alleys, much could be accomplished by incorporating LID principles into new construction and by phasing in LID conversions for existing infrastructure. However, these paved areas only account for a portion of the hardscape found in Los Angeles, and thus only a portion of the stormwater burden. Implementation of low impact development on a wider and more intensive scale throughout the city is worth consideration, both on public and private property.

Appendices

A large neighborhood development in Wilsonville, Oregon that
incorporates decentralized stormwater management features throughout.

Appendix I:

Additional LID Resources & Information

General Information About LID

The following websites are excellent sources of information about low impact development (LID) in general, and often serve as clearinghouses for LID knowledge, developments and issues. Some sites are focused on green infrastructure or stormwater best management practices (BMPs), which also apply to LID. Additionally, most the manuals and technical guides listed in the next section contain a wealth of low impact development information.

Low Impact Development Center— a non-profit organization dedicated to the advancement of Low Impact Development technology. Has a wealth of projects, research, publications and web links to pull from. http://www.lowimpactdevelopment.org/

U.S. Environmental Protection Agency

- *Low Impact Development (LID),* http://www.epa.gov/nps/lid/
- *Managing Wet Weather with Green Infrastructure*, http://cfpub.epa.gov/npdes/home.cfm?program_id=298
- "Green Infrastructure Municipal Handbook," http://cfpub.epa.gov/npdes/greeninfrastructure/munichandbook.cfm
- "Case Studies for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas," April 2008. http://www.epa.gov/brownfields/publications/swcs0408.pdf
- "Reduce Runoff: Slow It Down, Spread It Out, Soak It In," online video. http://www.epa.gov/owow/nps/lid/video.html
- Green infrastructure photo gallery, by Abby Hall of the USEPA. http://picasaweb.google.com/buildgreeninfrastructure

The Conservation Fund, Green Infrastructure Program

- Green infrastructure website, http://www.greeninfrastructure.net/
- "Green Infrastructure: Smart Conservation for the 21st Century," by Mark A. Benedict and Edward T. McMahon, http://www.sprawlwatch.org/greeninfrastructure.pdf

Natural Resources Defense Council— "Stormwater Strategies: Community Responses to Runoff Pollution," Chapter 12, Low Impact Development. May 1999. http://www.nrdc.org/water/pollution/storm/chap12.asp

The Green Infrastructure Center— assists communities in developing strategies for protecting and conserving their ecological and cultural assets through environmentally-sensitive decisions planning. http://www.gicinc.org/

Center for Neighborhood Technology—website contains information on a number of green infrastructure projects. http://www.cnt.org/natural-resources/

Greenroofs.com— news portal that promotes green roofs. Has a significant green roofs project database. www.greenroofs.com

Manuals and Technical Guides

The following manuals and technical guides provide valuable information on how other cities approach low impact development and contain research on effective stormwater best management practices. Most of these publications also have introductory information about low impact development, green infrastructure and stormwater BMPs. Some also contain technical information on specific projects.

California

County of Los Angeles

- Green Building Program, http://planning.lacounty.gov/green
    - "Low Impact Development Standards Manual," January 2009. http://planning.lacounty.gov/assets/upl/project/green_la-county-lid-manual.pdf
    - "Green Building and Sustainability Guidelines for the County of Los Angeles," 2008 Edition. http://planning.lacounty.gov/assets/upl/project/green_20080507-rpc-attachment-6.pdf
    - "Drought-Tolerant Plant List," http://planning.lacounty.gov/assets/upl/project/green_drought-tolerant-plants.pdf

- Department of Public Works
    - "Development Planning for Storm Water Management: A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP)," September 2002 Revision. http://ladpw.org/wmd/NPDES/table_contents.cfm
    - *Methodology For Prioritizing Structural BMP Implementation*, overview webpage. http://ladpw.org/WMD/bmpmethod/overview.shtm
    - "Los Angeles County-Wide Structural BMP Prioritization Methodology: A Guidance Manual for Strategic Storm Water Quality Project Planning," 2006. http://ladpw.org/WMD/bmpmethod/manual.shtm
    - "Hydrology Manual," January 2006. http://dpw.lacounty.gov/wrd/publication/engineering/2006_Hydrology_Manual/2006%20Hydrology%20Manual-Divided.pdf

City of Santa Monica— "Santa Monica Residential Green Building Guide." http://greenbuildings.smgov.net/pdf/Residential_GB_Guidelines.pdf

TreePeople— "Rainwater as a Resource: A Report on Three Sites Demonstrating Sustainable Stormwater Management." Description, cost assessments, maintenance schedules and schematics for three projects in Los Angeles. http://www.treepeople.org/vfp.dll?OakTree~getPage~&PNPK=207

City of Emeryville— "Stormwater Guidelines for Green, Dense Redevelopment," December 2005. Department of Planning & Building. http://www.ci.emeryville.ca.us/planning/pdf/stormwater_guidelines.pdf

County of San Diego— "Low Impact Development Handbook: Stormwater Management Strategies," December 31, 2007. Department of Planning and Land Use. http://www.co.san-diego.ca.us/dplu/docs/LID-Handbook.pdf

Other States / National

U.S. Environmental Protection Agency— "Storm Water Technology Fact Sheet—Vegetated Swales," September 1999. http://www.epa.gov/npdes/pubs/vegswale.pdf

U.S. Department of Defense— "United Facilities Criteria (UFC): Low Impact Development," October 25, 2004. http://www.wbdg.org/ccb/DOD/UFC/ufc_3_210_10.pdf

Prince George's County (MD)— Department of Environmental Resources, Programs and Planning Division.

- "Low Impact Development Design Strategies: An Integrated Approach," June 1999. www.lowimpactdevelopment.org/pubs/LID_National_Manual.pdf
- "Low-Impact Development Hydrologic Analysis," July 1999. http://www.lowimpactdevelopment.org/pubs/LID_Hydrology_National_Manual.pdf

State of Maryland— *Maryland Stormwater Design Manual—Volumes I & II,* effective October 2000. Department of the Environment. http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

Puget Sound Area (WA)— "Low Impact Development: Technical Guidance Manual for Puget Sound," January 2005. Puget Sound Action Team, Washington State University Pierce County Extension. www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

City of Portland (OR)— "City of Portland Stormwater Management Manual," Revision 4, July 1, 2008. Bureau of Environmental Services. http://www.portlandonline.com/bes/index.cfm?c=47952&

Fairfax County (VA)— "Fairfax County – LID BMP Fact Sheets" February 28, 2005. These fact sheets contain detailed information about the specific stormwater BMPs (purpose, costs, benefits, effectiveness, maintenance requirements, technical drawings, LEED credits, etc.). Includes bioretention systems, filtering technologies, permeable pavements, site design strategies, soil amendments, vegetative systems and water conservation measures. http://www.lowimpactdevelopment.org/fairfax.htm

City of Chicago (IL)—

- "The Chicago Green Alley Handbook." http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenAlleyHandbook.pdf
- "A Guide to Stormwater Best Management Practices: Chicago's Water Agenda," 2003. http://egov.cityofchicago.org/webportal/COCWebPortal/COC_ATTACH/GuideToStormwaterBMPs.pdf

State of Idaho— Department of Environmental Quality

- "Stormwater: Catalog of Stormwater BMPs for Idaho Cities and Counties," September 2005. http://www.deq.state.id.us/water/data_reports/storm_water/catalog/
  - "Volume 3. Low Impact Development Techniques," http://www.deq.state.id.us/water/data_reports/storm_water/catalog/vol_3.pdf

Implementing LID in Los Angeles

The following resources investigate important issues pertaining to the implementation of low impact development specifically in Los Angeles.

Community Conservancy International— "The Green Solutions Project" report, March 2008. Assesses the benefits of using LID on public lands in Los Angeles. http://www.ccint.org/greensolution.html

USC Center for Sustainable Cities— http://college.usc.edu/geography/ESPE/

- "Transforming Alleys into Green Infrastructure for Los Angeles," June 2008. http://college.usc.edu/geography/ESPE/documents/alleyreport_final_reduced.pdf

Greenforall.com— "Job Implications in Los Angeles' Green Building Sector," by Signalle Rosner, May 2006. http://www.greenforall.org/resources/job-implications-in-los-angeles-green-building

Los Angeles & San Gabriel Rivers Watershed Council (LASGRWC)

- *L.A. Basin Water Augmentation Study.* The Groundwater Water Augmentation Model (GWAM) was developed by the U.S. Bureau of Reclamation and the LASGRWC for the Los Angeles Basin Water Augmentation Study. By performing a soil moisture accounting, the model provides an estimate of the amount of infiltration, runoff and deep percolation under current conditions and the potential for greater groundwater recharge if various capture strategies are implemented. http://www.lasgrwc.org/WAS.htm

City of Los Angeles—

- "Porous Pavement Report," May 21, 2008. "CF: 05-0752 Alternative Street Surfacing Materials." Interdepartmental correspondence, to: Energy and the Environment Committee, from: Department of Public Works and Environmental Affairs Department. http://www.lacity.org/ead/greenbuilding/eadgreenbuilding298555988_10022008.pdf
- *Elmer Avenue: A Model Stormwater Green Street.* Department of Public Works, Stormwater Program. http://www.sga-inc.net/BACKUP/LA_newsletter/Elmer_Avenue.html*Coming to a Neighborhood Near You - Disconnected Downspouts.* Department of Public Works, Stormwater Program. http://www.sga-inc.net/BACKUP/LA_newsletter/Coming_to_a_Neighborhood_Near_You.html

- “Los Angeles River Revitalization Master Plan,” April 2007. Bureau of Engineering. http://www.lariverrmp.org/CommunityOutreach/masterplan_download.htm
- “RIO Fact Sheet: River Improvement Overlay District,” July 2007. Department of City Planning. http://cityplanning.lacity.org/Code_Studies/Rioproject/factsheet.pdf
- “Integrated Resources Plan (IRP): A New Strategy for LA’s Water Infrastructure—Information Sheet,” January 26, 2006. Department of Public Works, Bureau of Sanitation. http://www.lacity.org/SAN/irp/documents/factsheet012006.pdf

County of Los Angeles—
- “Los Angeles County BMP Effectiveness Study,” August 2005. Department of Public Works. http://dpw.lacounty.gov/wmd/NPDES/1994-05_report/Appendices/Appendix%20H-BMP%20Effectiveness.pdf
- “Watershed Management Techniques: Economic Valuation Model,” February 28, 2005. Report prepared by the Natelson Company, Inc. for the Department of Public Works, Watershed Management Division. Presents a methodology for cost-benefit analysis.

California State Water Resources Control Board— “A Review Of Low Impact Development Policies: Removing Institutional Barriers to Adoption,” December 2007. Prepared by the Low Impact Development Center. http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/docs/ca_lid_policy_review.pdf

California Department of Water Resources— Office of Water Use and Efficiency Transfers.
- *Updated Model Water Efficient Landscape Ordinance AB 1881*, overview webpage. http://www.owue.water.ca.gov/landscape/ord/updatedOrd.cfm/
- “Modified Text of Proposed Regulation,” California Code of Regulations, Title 23, Sections 490 - 495 regarding the Model Water Efficient Landscape Ordinance. November 26, 2008. http://www.owue.water.ca.gov/docs/Modified_Text_of_Proposed_Regulation.pdf

Evaluating the Effectiveness of LID

Reports and articles regarding the effectiveness of LID for controlling water flows and mitigating pollution levels. Some of these are case studies that included monitoring and evaluation.

County of Los Angeles— “Los Angeles County BMP Effectiveness Study,” August 2005. Department of Public Works. http://dpw.lacounty.gov/wmd/NPDES/1994-05_report/Appendices/Appendix%20H-BMP%20Effectiveness.pdf

Los Angeles & San Gabriel Rivers Watershed Council (LASGRWC)— *L.A. Basin Water Augmentation Study*. The Groundwater Water Augmentation Model (GWAM) was developed by the U.S. Bureau of Reclamation and the LASGRWC for the Los Angeles Basin Water Augmentation Study. By performing a soil moisture accounting, the model provides an estimate of the amount of infiltration, runoff and deep percolation under current conditions and the potential for greater groundwater recharge if various capture strategies are implemented. http://www.lasgrwc.org/WAS.htm

U.S. Environmental Protection Agency— “Urban Stormwater BMP Performance Monitoring: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements,” April 25, 2002. http://www.epa.gov/guide/stormwater/files/montch1and2.pdf

City of Portland (OR)— “Flow Test Report: Siskiyou Curb Extension, August 4th 2004.” Bureau of Environmental Services. http://www.portlandonline.com/shared/cfm/image.cfm?id=63097

Prince George’s County (MD)— “Final Technical Report: Pilot Projects for LID Urban Retrofit Program in the Anacostia River Watershed, Phase III,” December 30, 2006. Department of Environmental Resources. http://www.co.pg.md.us/Government/AgencyIndex/DER/ESG/pdf/Final%20Technical%20Report_Phase%20III.pdf

Costs of Implementing LID & Funding Strategies

The reports, articles and web pages listed below analyze the economic costs and benefits of LID projects and programs. They also contain strategies for funding LID efforts.

California

County of Los Angeles— "Watershed Management Techniques: Economic Valuation Model," February 28, 2005. Report prepared by the Natelson Company, Inc. for the Department of Public Works, Watershed Management Division. Presents a methodology for cost-benefit analysis.

UC Riverside, Department of Environmental Sciences—

- "Costs and Infiltration Benefits of the Watershed Augmentation Study Sites," by Autumn DeWoody, W. Bowman Cutter, David Crohn. April 17, 2006. Five non-residential land uses located in Los Angeles County were equipped with infiltration BMPs. Study estimated the groundwater recharge benefits relative to total costs. http://www.lasgrwc.org/WAS/Documents/UCR_LASGRWC_041806.pdf
- "Capturing Urban Stormwater Runoff: A Decentralized Market-Based Alternative," by Kenneth A. Baerenklau, W. Bowman Cutter, Autumn DeWoody, Ritu Sharma, and Joong Gwang Lee. *Policy Matters,* Volume 2, Issue 3. Fall 2008. Investigates the cost-effectiveness of implementing parcel-level BMPs in a Los Angeles area watershed using competitive bidding. http://policymatters.ucr.edu/pmatters-vol2-3-water.pdf
- "Costs and Benefits of Capturing Urban Runoff With Competitive Bidding for Decentralized Best Management Practices," by W. Bowman Cutter, Kenneth A. Baerenklau, Autumn DeWoody, Ritu Sharma, and Joong Gwang Lee. *WaterResources Research,* September 6, 2008. Investigates the cost effectiveness of implementing BMPs in a Los Angeles area watershed with two voluntary incentive mechanisms: competitive bidding and a fixed subsidy. http://www.agu.org/pubs/crossref/2008/2007WR006343.shtml

Kolozsvari, Douglas and Donald Shoup— (2003). *Turning Small Change Into Big Changes*. Article about parking increment financing. http://www.walkablestreets.com/meter.htm

Institute For Local Government— (2005) *Funding Open Space Acquisition Programs: A Guide for Local Agencies in California*, "Chapter 8: Creating Benefit Assessment Districts." http://www.cacities.org/resource_files/23925.ILG_OpenSpace_Ch8.pdf

City and County of San Francisco—*Press Room: Press Release.* "Mayor Newsom Unveils First-Ever City Carbon Offsets to Fight Global Warming," December 18, 2007. http://sfgov.org/site/mayor_index.asp?id=72509

Other States/National

U.S. Environmental Protection Agency

- *Fact Sheet: Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007. http://www.epa.gov/owow/nps/lid/costs07/factsheet.html
- "Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices," December 2007. EPA Document #EPA 841-F-07-006. http://www.epa.gov/owow/nps/lid/costs07/documents/reducingstormwatercosts.pdf
- "Managing Wet Weather with Green Infrastructure: Municipal Handbook - Funding Options." 2008. http://www.epa.gov/npdes/pubs/gi_munichandbook_funding.pdf

Keely, Melissa— "Using Individual Parcel Assessments to Improve Stormwater Management." Journal of the American Planning Association, Vol. 73, No. 2, Spring 2007.

The Trust For Public Land— *Benefit Assessment Districts.* How benefit assessment districts can be used for conservation finance. http://www.tpl.org/tier3_cd.cfm?content_item_id=1058&folder_id=825

ECONorthwest— "The Economics of Low Impact Development: A Literature Review," November 2007. http://www.econw.com/reports/ECONorthwest_Low-Impact-Development-Economics-Literature-Review.pdf

City of Seattle (WA)— *Drainage Rate Schedule*. Stormwater drainage fees for 2009. http://www.ci.seattle.wa.us/util/Services/Drainage_&_Sewer/Rates/DrainageRates/RateSchedule/index.htm

City of Minneapolis (MN)— *Stormwater Utility Fee: Frequently Asked Questions.* http://www.ci.minneapolis.mn.us/stormwater/fee/stormwater_faq.asp

City of Portland (OR)— *1% for Green* funding program. Portland Bureau of Environmental Sciences. http://www.portlandonline.com/bes/index.cfm?c=48702&

Colorado Carbon Fund— *Project C: We Have The Power.* Website for the State of Colorado's carbon offset sales program. http://www.coloradocarbonfund.org/

LID-Related Performance & Rating Systems

The following websites and article highlight rating systems that were created or are in development to help implement LID and green infrastructure practices in a systematic way.

U.S. Green Building Council— LEED (Leadership in Energy and Environmental Design) green building rating system. http://www.usgbc.org/DisplayPage.aspx?CategoryID=19

Sustainable Sites— a system proposed by landscape architects to certify the ecological design of outdoor spaces, separate from buildings. www.sustainablesites.org

City of Seattle (WA)— *Seattle Green Factor: What is the Seattle Green Factor?* Department of Planning & Development. http://seattle.gov/dpd/permits/greenfactor/Overview/

Keely, Melissa— "Using Individual Parcel Assessments to Improve Stormwater Management." Journal of the American Planning Association, Vol. 73, No. 2, Spring 2007. Article discusses the Green Area Ratio as a way to assess how "green" properties are.

Examples of LID Programs & Projects

Listed below are links to low impact development programs and projects happening in other cities. The earlier section on "Manuals and Technical Guides" and the items featured in Appendix II also contain references to programs in other cities.

Wise, Steve— "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning*, the magazine of the American Planning Association. August/September 2008. Pages 14-19. Article describes a wide variety of projects from around the United States.

County of Los Angeles— Green Building Program, Department of Regional Planning. http://planning.lacounty.gov/green

City of Santa Monica— Energy & Green Building Programs. http://greenbuildings.smgov.net/index.html

Village Homes (Davis, CA)— *About Village Homes.* http://www.villagehomesdavis.org/public/about

City of Portland (OR)—

- *A Sustainable Approach to Stormwater Management,* http://www.portlandonline.com/bes/index.cfm?c=34598
- "NE Siskiyou Green Street Project: Project Summary," April 2005. Bureau of Environmental Services. http://www.portlandonline.com/bes/index.cfm?a=78299&c=45386
- *Hyperlocalizing Hydrology in the Post-Industrial Urban Landscape*. February 18, 2008. An independent blog that features excellent photos of the NE Siskiyou Street project. http://pruned.blogspot.com/2008/02/hyperlocalizing-hydrology-in-post.html

City of Seattle (WA)— *Street Edge Alternatives (SEA Streets) Project.* Public Utilities Commission. http://www.seattle.gov/UTIL/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

City of Chicago (IL)— Green Alleys program, Department of Transportation. http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?BV_SessionID=@@@@1030171822.1233726916@@@@&BV_EngineID=cccdadeggjimimjcefecelldffhdfhm.0&contentOID=536946345&contenTypeName=COC_EDITORIAL&topChannelName=Dept&blockName=Transportation%2FGreen+Alleys%2FI+Want+To&context=dept&channelId=0&programId=0&entityName=Transportation&deptMainCategoryOID=-536883915

City of Boston (MA)— *Low Impact Development Tool Kit.* Boston Metropolitan Area Planning Council. http://www.mapc.org/LID.html

City of Vancouver (Canada)—
- Green Streets Program, Department of Engineering Services. http://vancouver.ca/engsvcs/streets/greenstreets/index.htm
- Sustainable Streets and "Country Lanes" programs, Department of Engineering Services. http://vancouver.ca/ENGSVCS/streets/design/enviro.htm
- *Streets: Environmentally Sustainable Options.* Department of Engineering Services. http://vancouver.ca/ENGSVCS/streets/design/enviro.htm
- Green Streets and Adopt-A-Street Garden programs, http://vancouver.ca/engsvcs/streets/greenstreets/index.htm

Appendix II:

LID Ordinances and Programs from Other Municipalities

The following items have been included in this appendix:

1. County of Los Angeles: Low Impact Development Ordinance
2. City of Ventura: Green Streets Matrix

Additional resources on LID ordinances and programs can be found at these websites:

Clean Air Cool Planet— website that lists community programs around the county with Green Building Ordinances. http://www.cleanair-coolplanet.org/for_communities/green_building_ordinances.php

County of Los Angeles— "Ordinances for Green Building, Low Impact Development and Drought-Tolerant Landscaping," November 14, 2008. http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf

City of Santa Monica— Energy & Green Building Programs. *New Green Building Ordinance.* http://greenbuildings.smgov.net/index.html

State of Maryland— *Maryland Stormwater Mangement Act of 2007.* Department of the Environment. http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/swm2007.asp

Vermont League of Cities & Towns—

- "Model Low Impact Development Stormwater Management Bylaw," May 2008. http://resources.vlct.org/u/o_LID-secured.pdf
- "Riparian Buffer Model Ordinance," http://resources.vlct.org/u/o_riparianbuffer-secured.pdf

County of Los Angeles: LID Ordinance

The County's Low Impact Development Ordinance was one of three "green" ordinances passed on October 7, 2008. The text of the other two ordinances (Drought Tolerant Landscaping Ordinance and Green Building Ordinance) can be found at http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf.

COUNTY OF LOS ANGELES
OFFICE OF THE COUNTY COUNSEL
648 KENNETH HAHN HALL OF ADMINISTRATION
500 WEST TEMPLE STREET
LOS ANGELES, CALIFORNIA 90012-2713

RAYMOND G. FORTNER, JR.
County Counsel

TELEPHONE
(213) 974-7546
FACSIMILE
(213) 613-4751
TDD
(213) 633-0901

November 14, 2008

Agenda No. 76
10/07/08

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, California 90012

Re: Ordinances for Green Building, Low Impact Development, and Drought-Tolerant Landscaping

Dear Supervisors:

Following your hearing on October 7, 2008, your Board instructed our office to prepare final ordinances, subject to the modifications approved by your Board, to establish development standards for green building, low impact development, and drought-tolerant landscaping for projects constructed after January 1, 2009. As instructed, enclosed are the analyses and ordinances for your consideration and adoption, with your Board's approved modifications.

Very truly yours,

RAYMOND G. FORTNER, JR.
County Counsel

By
LAWRENCE L. HAFETZ
Principal Deputy County Counsel
Property Division

APPROVED AND RELEASED:

for Leela Kapur
RAYMOND G. FORTNER, JR.
County Counsel

LLH:gl

Enclosures

HOA.565921.1

ANALYSIS

This ordinance amends Title 12 - Environmental Protection, Title 21 - Subdivisions, and Title 22 - Planning and Zoning of the Los Angeles County Code to establish low impact development standards for developments constructed after January 1, 2009. The low impact development standards are intended to distribute stormwater and urban runoff across development sites to help reduce adverse water quality impacts and help replenish groundwater supplies. The ordinance creates low impact development standards which are to be reflected in development site plans and in separate low impact development plans.

RAYMOND G. FORTNER, JR.
County Counsel

By
LAWRENCE L. HAFETZ
Principal Deputy County Counsel
Property Division

LLH:sh
10/09/08 (requested)
11/12/08 (revised)

563934_2

ORDINANCE NO. ____________________

An ordinance amending Title 12 - Environmental Protection, Title 21 - Subdivisions, and Title 22 - Planning and Zoning of the Los Angeles County Code to establish low impact development standards for developments constructed after January 1, 2009.

The Board of Supervisors of the County of Los Angeles ordains as follows:

SECTION 1. Chapter 12.84 is hereby added to Title 12 to read as follows:

CHAPTER 12.84

LOW IMPACT DEVELOPMENT STANDARDS

Sections:

12.84.410 Purpose.
12.84.420 Definitions.
12.84.430 Applicability.
12.84.440 Low Impact Development Standards.
12.84.450 Site Plan/LID Plan Review.
12.84.460 Additional Requirements.

12.84.410 Purpose.

The purpose of this chapter is:

A. To require the use of low impact development ("LID") standards in developments. LID encourages site sustainability and smart growth in a manner that respects and preserves the characteristics of the County's watersheds, drainage paths, water supplies, and natural resources. LID builds on conventional design strategies by utilizing every softscape and hardscape surface in a development to perform a beneficial hydrologic function by retaining, detaining, storing, changing the timing of, or

563934_2

filtering stormwater and urban runoff. LID encompasses the use of structural devices, engineered systems, vegetated natural designs, and education in order to distribute stormwater and urban runoff across a development site. LID reduces the impact from the development and provides the benefits of:

1. Replenishing groundwater supplies;
2. Improving the quality of surface water runoff;
3. Stabilizing natural stream characteristics;
4. Preserving natural site characteristics; and
5. Minimizing downstream impacts.

B. The provisions in this Chapter 12.84 shall be construed to augment any county, state, or federal ordinance, statute, regulation, or other requirement governing the same or related matter, and where a conflict exists between a provision in this Chapter 12.84 and such other ordinance, statute, regulation, or requirement, the stricter provision shall apply to the extent permitted by law.

12.84.420 Definitions.

The following definitions shall apply to this chapter:

A. "Beneficial Use" means the existing or potential use of receiving waters as designated by the Los Angeles or Lahontan Regional Water Quality Control Boards in their respective basin plans for the County.

B. "Best management practices (BMPs)" are the methods, measures, and/or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges, including stormwater.

C. "County" means the County of Los Angeles.

D. "Development" means activity requiring discretionary or non-discretionary land use or construction approval from the County that results in the creation, addition, modification, or replacement of impervious surface area, which replacement is not part of routine maintenance activity. Development includes, but is not limited to, land subdivisions; the construction, installation, addition, or replacement of a building or structure; expansion of a building footprint; and land-disturbing activities related to structural or impervious surfaces. Development shall not include routine maintenance of original lines and grades and/or hydraulic capacity.

E. "Director" means the Director of Public Works.

F. "Drainage system" means a conveyance or system of conveyances, including paths, drives, roads, streets, alleys, catch basins, curbs, gutters, ditches, man-made channels, or storm drains designed or used to collect or convey urban runoff and stormwater.

G. "Excess Volume" means the additional volume of stormwater caused by development; excess volume is determined by calculating the difference in the volume of runoff under undeveloped and post-developed conditions, using the water quality design storm event.

H. "Hardscape" means any durable pervious or impervious surface material, including paving for pedestrians and vehicles.

I. "Hydromodification" means the alteration of a natural drainage system through a change in the system's flow characteristics.

J. "Low impact development ("LID")" means technologies and practices that are part of a sustainable stormwater management strategy that controls stormwater and urban runoff on site.

K. "Natural drainage system" means any unlined or unimproved (not engineered) creek, stream, river, or similar waterway.

L. "Pollutants of concern" means chemical, physical, or biological components of stormwater that impair the beneficial uses of receiving waters, including those defined in the federal Clean Water Act Section 502(6) (33 United States Code Section 1362(6)), and incorporated by reference into California Water Code Section 13373.

M. "Public Works" means the Los Angeles County Department of Public Works.

N. "Softscape" means the horticultural elements of a landscape, such as soil and plants.

O. "Stormwater" means runoff that occurs as the result of rainfall.

P. "Urban runoff" means dry weather surface flows emanating from urban development.

Q. "Water quality design storm event" means any of the volumetric or flow rate based design storm events for water quality BMPs identified in the National Pollutant Discharge Elimination System Municipal Stormwater Permit for the County of Los Angeles.

12.84.430 Applicability.

A. This chapter shall become effective on January 1, 2009, and shall apply to all development within the unincorporated areas of the County after that date except for the following:

1. Any development where a complete discretionary or non-discretionary permit application was filed with the Los Angeles County Department of Regional Planning, Public Works, or any County-controlled design control board, prior to January 1, 2009;

2. Any development involving emergency construction activities required to immediately protect public health and safety; or

3. Public road and flood control infrastructure developments, which shall be subject to Public Works' design standards that incorporate LID principles.

B. Unless excluded by subsection A above, any development that alters an existing impervious surface area shall comply with this Chapter 12.84 as follows:

1. Where the development results in an alteration of at least fifty (50) percent of the impervious surfaces of an existing developed site, the entire site shall be brought into compliance with the standards and requirements of this Chapter; and

2. Where the development results in an alteration of less than fifty (50) percent of the impervious surfaces of an existing developed site, only such incremental development shall meet the standards and requirements of this Chapter; and

3. Where a development results in an alteration of less than fifty (50) percent of the impervious surfaces of an existing developed site consisting of four (4) or fewer residential units, the development shall be exempt from this Chapter.

12.84.440 Low Impact Development Standards.

A. The LID standards of this Chapter are:

1. Mimic undeveloped stormwater and urban runoff rates and volumes in any storm event up to and including the "50-year capital design storm event," as defined by Public Works;

2. Prevent pollutants of concern from leaving the development site in stormwater as the result of storms, up to and including a water quality design storm event; and

3. Minimize hydromodification impacts to natural drainage systems.

B. The Director shall prepare, maintain, and update, as deemed necessary and appropriate, a manual ("LID Standards Manual"), which shall include urban and stormwater runoff quantity and quality control development principles and technologies for achieving the LID Standards described in subsection A of this Section. The LID Standards Manual shall also include technical feasibility and implementation parameters, as well as other rules, requirements and procedures as the Director deems necessary, for implementing the provisions of this Chapter 12.84.

C. To meet the standards described in subsection A of this Section, developments shall install and maintain minimum site design features as follows:

1. A development consisting of four (4) or fewer residential units shall implement at least two LID BMP alternatives listed in the LID Standards Manual, which alternatives include, but are not limited to, disconnecting impervious surfaces, using porous pavement, downspout routing, a dry well, landscaping and irrigation requirements, and a green roof.

2. A development consisting of five (5) or more residential units, or a nonresidential development, shall comply with the following requirements:

a. The excess volume from each lot upon which such development is occurring shall be infiltrated at the lot level, or in the alternative, the excess volume from the entire development site, including streets and public right-of-way, shall be infiltrated in sub-regional facilities. The tributary area of a sub-regional facility shall be limited to five (5) acres, but may be exceeded with approval of the

Director. When infiltration of all excess volume is not technically feasible, on-site storage, reuse, or other water conservation uses of the excess volume is required and shall be implemented as authorized by the Director in accordance with the requirements and provisions in the LID Standards Manual.

b. The runoff from the water quality design storm event associated with the developed site hydrology must be treated to the satisfaction of the Director before discharge.

12.84.450 Site Plan/LID Plan Review.

Compliance with the LID standards of this Chapter 12.84 shall be shown through a site plan review described in subsection A, below, and a LID plan review described in subsection B, below.

A. Site plan review.

1. The County Department of Regional Planning shall conduct a site plan review in accordance with Title 22 of the Los Angeles County Code to determine compliance with this Chapter 12.84. The site plan submitted for the development shall clearly depict any and all LID standards that will be incorporated into the development. Regional Planning shall approve compliance with these standards in concept only, subject to the setback and development standards in Title 22. Final approval of such compliance shall be made by Public Works in conjunction with its review and approval of the LID plan described in subsection B.

2. The same site plan shall be used to show compliance with this Chapter 12.84, the green building requirements of Part 20, Chapter 22.52, and the drought-tolerant landscaping requirements of Part 21, Chapter 22.52, to the extent these other requirements apply to the development.

3. In any case where a site plan for a development has been or will be concurrently filed with an application for a permit, variance, zone change, development agreement, or other discretionary approval under Title 22, or with an application for a subdivision under Title 21, the site plan procedure set forth in this Section 12.84.450 shall not apply and instead, the Exhibit "A," tentative map, or other site plan required for such other approval shall be used to show compliance with this Chapter 12.84.

B. LID plan review.

In addition to the site plan required by subsection A of this Section, the applicant shall also submit a LID plan to the Director for review and approval that provides a comprehensive, technical discussion of how the development will comply with this Chapter 12.84 and the LID Standards Manual. A deposit and fee to recover the costs associated with LID plan review shall be required. The time for obtaining LID plan approval shall be as follows:

1. For subdivisions, the LID plan shall be approved prior to the tentative map approval;

2. For any development requiring a conditional use permit ("CUP") or other entitlement required under Title 22 of the Los Angeles County Code, the LID plan shall be approved prior to the issuance of any such CUP or other entitlement; and

3. For all other development, the LID plan shall be approved prior to issuance of a grading permit for such development, and when no grading permit is required, prior to the issuance of a building permit for such development.

12.84.460 Additional Requirements.

Compliance with this Chapter 12.84 shall also require a development to satisfy the following:

A. All grading and/or site drainage plans for the development shall incorporate the features of the approved LID plan described in subsection B of Section 12.84.450.

B. The development's LID features shall be maintained and shall remain operable at all times and shall not be removed from the development unless and until such features have been replaced with other LID features in accordance with this Chapter 12.84. A covenant or agreement shall be recorded in the office of the Los Angeles County Registrar-Recorder/County Clerk indicating that the owner of the subject development is aware and agrees to the requirements in this subsection B. The covenant or agreement shall also include a diagram of the site indicating the location and type of each LID feature incorporated into the development. The time to record such covenant or agreement shall be as follows:

1. For any subdivision, prior to final map approval; and

2. For any other development, prior to issuance of a grading permit for the development, and when no grading permit is required, prior to the issuance of a building permit for the development.

SECTION 2. Section 21.24.420 of Title 21 of the Los Angeles County Code is hereby added to read as follows:

21.24.420 Low Impact Development.

All subdivisions shall comply with the low impact development requirements of Chapter 12.84 of Title 12 of the Los Angeles County Code, subject to the applicability provisions of said Chapter.

SECTION 3. Part 22 of Chapter 22.52 is hereby added to read as follows:

Part 22

LOW IMPACT DEVELOPMENT

22.52.2210 Applicability.

All development, as defined in Chapter 12.84 of Title 12 of the Los Angeles County Code, shall comply with the low impact development requirements of said Chapter, subject to the applicability provisions of said Chapter.

[LOWIMPACTDEVLHCC]

GREEN STREETS MATRIX City of Ventura Department of Public Works, 2008

Level I	Description	Example	Cost / Benefits	Challenges / Drawbacks
Storm Inlet Trash Excluders	Trash excluders are screens that are installed inside catch basins or at curb inlets. They prevent trash from entering the storm drain system. Screen size opening is typically around 4 mm. Smaller debris / silt and contaminants such as heavy metals will still pass through the screens.		Low cost/low effectiveness (~$1,500 each)	On-going maintenance is required to clean trash from catch basins. Only prevents trash from entering tributaries (not chemicals, silt). On-going maintenance costs for cleaning catch basins will increase as more are installed.
Planting of medium to large canopy trees in parkways and medians	Plant new or preserve existing medium to large canopy trees in parkways and medians. Tree species should be compatible with adjacent curbs and sidewalks to minimize potential damage that may be caused by roots.		Low upfront cost /high effectiveness (~$400 for 24" box tree). Once mature, larger canopy trees are effective in reducing peak storm run-off rates by capturing rainfall in their canopy. They are also very attractive and can raise property values by $10,000 or more.	Medium to high maintenance cost to control and preserve the trees. Bulbouts or sidewalk realignments may need to be installed in narrower parkways (see *Parkway Tree Bulbouts*). Tree roots can be destructive to buried utilities, sidewalks, curbs and gutters. Residents may not care for the increased maintenance (leaf pickup). Overhead utilities can be problematic for ongoing pruning that can damage trees.
Utilization of recycled materials in new and resurfaced streets	Utilize rubberized asphalt (recycled tires), 15% recycled mix, in-place pulverized asphalt and aggregates in the construction of new streets or in street resurfacing projects		Cost competitive compared to using new materials. Relative costs are likely to decrease due to supply constraints and hauling costs for new materials.	Projects may take longer to construct depending on time-of-year and other factors. Tighter inspections (QA/QC) also required.

RB-AR16525

Parkway Tree Bulbouts	Parkway bulbouts may be used to preserve shallow roots on large trees that may be damaging curbs and sidewalks. Bulbouts are a localized extension of the curb and gutter at parkways in the immediate vicinity of a tree. They may be used where new trees are planted so that shallow roots are less likely to cause expensive damage to curbs and gutters when they mature. Wider parkways generally make healthier trees.		Medium cost / relatively effective in preserving older trees. May provide the added benefit of traffic calming.	May be difficult to accomplish on flat streets where the bulbout may impede drainage flows along the gutter. Reduces on-street parking, which is problematic in medium to higher density residential developments. Could be difficult to install if underlying utilities are present.
Recycled rubber sidewalks	Rubberized sidewalks are best used at locations where sidewalks have or may continue to buckle from existing tree roots.		Medium to high lifetime cost. 3 times the cost of concrete @ $15 to $20/square foot to install plus reinstallation costs over time. Environmentally friendly by using recycled rubber from tires.	Rubber sidewalks may need to be reinstalled every 5-10 years as tree roots continue to grow and cause uneven surfaces in the sidewalk.

GREEN STREETS MATRIX **City of Ventura Department of Public Works, 2008**

Level 2	Description	Example	Cost / Benefits	Challenges / Drawbacks
Permeable concrete sidewalks	Install permeable concrete for sidewalks in new or existing streets – particularly where sidewalks are in close proximity to new trees. As opposed to rubber sidewalks, permeable concrete is better suited at locations where new trees are planted and roots have not yet been established.		Provides storm water detention and treatment. Creates a "barrier" for storm run-off between impervious driveways and streets. Allows rainfall/irrigation to percolate into the ground to feed tree roots. Approximately twice the cost of conventional concrete, not including over excavation and aggregate subgrade.	More stringent QA/QC requirements to insure proper functioning. Surface of concrete is much rougher than traditional concrete and is not as attractive. More feasible if done only around trees to allow infiltration of storm and irrigation run-off to reach tree roots under tree drip lines.
Storm drain biotreatment curb inlets (i.e. Filterra)	Low flow biotreatment units typically come premanufactured and are installed upstream from storm curb inlets or catch basins. They typically remove chemicals, oils, and particulates from initial storm runoffs (which often contain the lions' share of contaminants).		Can be very effective in removing pollutants from storm run-off if sized right for the runoff area and adequately maintained. Cost to install is anywhere from \$10,000 to \$35,000 per unit. There is an on-going annual maintenance cost which is uncertain at this time.	Need an existing storm drain system to be in place. Larger units can only treat about 0.5 acres of impervious street. If there is only one curb inlet on a 5-acre street, the unit's effectiveness is substantially diminished. The units are better suited for relatively small watershed areas.
Stormwater detention and percolation curb inlets	– same as above without special media and no connection to storm drain system is made. Storm water percolates naturally into the ground.	Similar appearance to above without the tree	Can be very effective in removing pollutants from storm run-off if sized right for the runoff area and adequately maintained. Cost to install is anywhere from \$10,000 to \$35,000 per unit. There is an on-going annual maintenance cost, which is not known.	Similar to the biotreatment units. Does not require an existing underground storm drain system. The bottom of the unit is broken out and allows water to percolate into the ground.

Sidewalk "bridges" and realignments to preserve mature trees	Sidewalk bridges and realignments may also be used to preserve shallow roots on trees that may be damaging sidewalks. Bridges allow roots to continue to grow without causing the adjacent sidewalk to buckle.		Medium to high cost (estimated at $2,250 each / very effective. Low maintenance if proper materials and construction techniques are used.	Bridges may pose tripping, slipping and similar hazards unless careful attention is made in the design. Maintenance can be high if weather/rot resistant materials are not used. Realignments as depicted may require obtaining easements onto private property.

GREEN STREETS MATRIX **City of Ventura Department of Public Works, 2008**

<u>**Level 3**</u>	<u>**Description**</u>	<u>**Example**</u>	<u>**Cost / Benefits**</u>	<u>**Challenges / Drawbacks**</u>
Bioswales in existing developed neighborhoods	Install bioswales within the street right-of-way of <u>existing</u> developments. Bioswales are typically rock or grass-lined depressions that detain and treat storm water prior to flowing into a storm drain system.		Very high upfront and on-going maintenance cost. Provides storm water detention, percolation and treatment and improved street aesthetics. Can be very effective at treating storm run-off and reducing peak storm run-off rates. More cost effective if installed as part of <u>new</u> developments.	Will be difficult to maintain without an on-going funding commitment such as a Maintenance Assessment District. Eliminates on-street parking. The need to remove or relocate underground utilities will increase upfront costs significantly.
Permeable parking lane via asphalt, concrete, pavers or turfcrete	Install permeable material in the parking lane only for existing streets.		Very high upfront cost but lower life-cycle cost than the installation of a bioswale in an existing street. On-street parking would not be lost. Provides storm water detention and treatment but to a lesser extent than bioswales.	Upfront cost will be high if done along the entire stretch of a street (as opposed to pockets). Subgrade will likely need to be dugout 2-feet. Will require off-hauling large amounts of in-situ soil and importing large amounts of aggregate for underlying base. Will significantly increase truck/hauling traffic on local City Streets. Can't be done on streets with grades exceeding 5%. Vacuum cleaning may be required every several years to remove trapped particles.

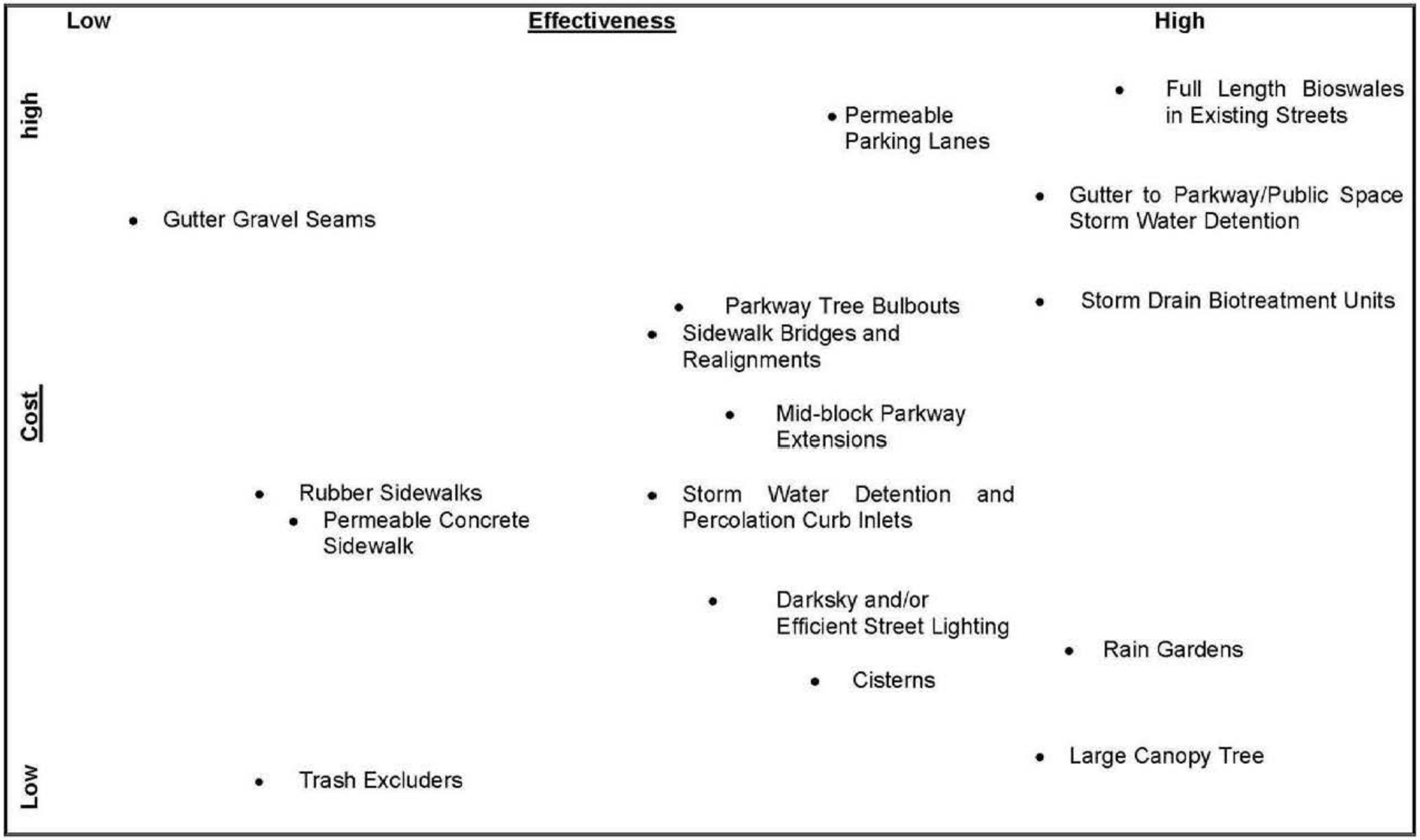
GREEN STREETS MATRIX **City of Ventura Department of Public Works, 2008**

Mid-block parkway extension for bioswales/stormwater detention	A mid-block and/or end-of-block parkway extension can provide detention for storm run-off, percolation and treatment. The design would consist of 50 to 100-foot long extensions in the parkway. The concept could be extended to intermittent locations along a stretch of road.		This is a less expensive alternative than running a bio-swale down the entire length of a street. Relatively small upfront costs and medium lifetime costs for on-going maintenance. Provides some detention and percolation, provides traffic calming and improved street aesthetics.	On-going maintenance costs can be an issue without a Maintenance Assessment District. Loss of parking in the street is also a concern, especially for the property owners that are directly impacted.
Cisterns/rainbarrels at individual private properties	Home owners would install cisterns that collect storm water from roof tops for later use as irrigation water. This is an inexpensive alternative to modifications within the street right-of-way for reducing peak storm run-off rates.		Low upfront and maintenance cost/high effectiveness (~$140 per barrel). Conserves drinking water used for irrigation purposes and reduces peak storm run-off rates.	Would need to set up an incentive/subsidy/ educational program to implement. Cisterns that prevent mosquito breeding are available. Program could be on a citywide or street resurfacing project basis. They cannot be funded with gas tax since they are on private property.
Rain gardens at individual private properties	Home owners would install rain gardens that consist of “depressed” areas on private property that collect rainwater from roof tops. This is an inexpensive alternative to modifications within the street right-of-way for reducing peak storm run-off rates.		Potentially low upfront cost/high effectiveness (cost can vary). Conserves drinking water used for irrigation purposes and reduces peak storm run-off rates.	Would need to set up an incentive/subsidy/ educational program to implement. Program would be on a citywide or street resurfacing project basis. Rain gardens require more maintenance than cisterns. They cannot be funded with gas tax since they are on private property.

GREEN STREETS MATRIX **City of Ventura Department of Public Works, 2008**

Gutter to parkway/public space stormwater detention	This design concept provides some detention, percolation and treatment without actually extending or widening the parkway into the street. Different from rain gardens in that runoff is diverted from street to a "rain garden".		Low to medium upfront cost but potentially high lifetime costs for on-going maintenance. Can provide good detention and percolation and improved street aesthetics if properly maintained.	On-going maintenance costs can be an issue without a Maintenance Assessment District.
Gravel Gutter Seams	Install a 12-inch to 24-inch wide band of gravel along curbs in streets to capture and percolate storm water.	PICTURE NOT AVAILABLE	Relatively high upfront cost and potentially high on-going maintenance cost.	Gravel would likely spill out and cause tripping / roadway hazards. Only recommended for rural and unpaved streets/roadways.
"Dark-sky" and/or energy efficient (LED) street lighting	Dark sky streetlights are designed so that lighting is directed downward onto the street surface and not into the sky. This allows stars to remain visible at night and eliminates wasted energy. LED-type light fixtures are a highly energy efficient type of "bulb" that may be combined with Dark Sky housing.		Medium to high upfront cost (~$5,000) including the pole. Existing poles can be retrofitted but spacing may not be adequate. Lifetime cycle costs are anticipated to be much less than traditional high pressure sodium or metal hallide lights. The costs for LEDs is expected to decrease substantially in coming years.	To obtain adequate spacing, new poles, conduit and wiring may be required which may significantly increase cost. Most lights in the City are owned and maintained by Edison, which will require interagency cooperation for replacement.

RELATIVE COST AND EFFECTIVENESS OF VARIOUS GREEN STREET ELEMENTS



Appendix III:

Research on the Costs of LID

EPA Fact Sheet: Reducing Costs Through LID

"Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices" This fact sheet provides additional information about EPA's report Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, EPA publication number 841-F-07-006, December 2007. Available online at http://www.epa.gov/owow/nps/lid/costs07/documents/factsheet-reducingstormwatercosts.pdf

Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices

This fact sheet provides additional information about EPA's report *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, EPA publication number 841-F-07-006, December 2007.

BACKGROUND

Stormwater has been identified as a major source of pollution for all waterbody types in the United States, and the impacts of stormwater pollution are not static; they usually increase with land development and urbanization. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located.

Parking lot runoff is allowed to infiltrate through a vegetated bioretention area

Low Impact Development (LID) is a stormwater management strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution. LID comprises a set of site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. These practices can effectively remove nutrients, pathogens, and metals from stormwater, and they reduce the volume and intensity of stormwater flows.

COST ANALYSIS

This report is an effort to compare the projected or known costs of LID practices with those of conventional development approaches. Traditional approaches to stormwater management typically involve hard infrastructure, such as curbs, gutters, and piping. LID-based designs, in contrast, are designed to use natural drainage features or engineered swales and vegetated contours for runoff conveyance and treatment. In terms of costs, LID techniques can reduce the amount of materials needed for paving roads and driveways and for installing curbs and gutters. Other LID techniques can eliminate or reduce the need for curbs and gutters, thereby reducing infrastructure costs. Also, by infiltrating or evaporating runoff, LID techniques can reduce the size and cost of flood-control structures. Note that in some circumstances LID techniques might result in higher costs because of more expensive plant material, site preparation, soil amendments, underdrains and connections to municipal stormwater systems, as well as increased project management costs. Other considerations include land required to implement a management practice and differences in maintenance requirements. Finally, in some circumstances LID practices can offset the costs associated with regulatory requirements for stormwater control.

EPA Fact Sheet: Reducing Costs Through LID

FINDINGS

Seventeen case studies were evaluated for this report. In general, the case studies demonstrated that LID practices can reduce project costs and improve environmental performance. Although not all the benefits of the projects highlighted in the case studies were monetized, with a few exceptions, LID practices were shown to be both fiscally and environmentally beneficial to communities. In a few case studies, initial project costs were higher than those for conventional designs; in most cases, however, significant savings were realized due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs. (Table 1)

Table 1. Cost Comparisons Between Conventional and LID Approaches

Project[a]	Conventional Development Cost	LID Cost	Cost Difference[b]	Percent Difference[b]
2nd Avenue SEA Street	$868,803	$651,548	$217,255	25%
Auburn Hills	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall	$27,600	$5,600	$22,000	80%
Bellingham Bloedel Donovan Park	$52,800	$12,800	$40,000	76%
Gap Creek	$4,620,600	$3,942,100	$678,500	15%
Garden Valley	$324,400	$260,700	$63,700	20%
Kensington Estates	$765,700	$1,502,900	–$737,200	-96%
Laurel Springs	$1,654,021	$1,149,552	$504,469	30%
Mill Creek[c]	$12,510	$9,099	$3,411	27%
Prairie Glen	$1,004,848	$599,536	$405,312	40%
Somerset	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus	$3,162,160	$2,700,650	$461,510	15%

[a] Some of the case study results do not lend themselves to display in the format of this table (Central Park Commercial Redesigns, Crown Street, Poplar Street Apartments, Prairie Crossing, Portland Downspout Disconnection, and Toronto Green Roofs). [b] Negative values denote increased cost for the LID design over conventional development costs. [c] Mill Creek costs are reported on a per-lot basis.

A rain garden manages runoff from impervious surfaces such as roofs and paved areas.

In all cases, LID provided other benefits that were not monetized and factored into the project bottom line. These benefits include improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased total number of units developed, increased marketing potential, and faster sales. The case studies also provided other environmental benefits such as reduced runoff volumes and pollutant loadings to downstream waters, and reduced incidences of combined sewer overflows.

CONCLUSIONS

This report summarizes 17 case studies of developments that include LID practices and concludes that applying LID techniques can reduce project costs and improve environmental performance. In most cases, LID practices were shown to be both fiscally and environmentally beneficial communities. In a few cases, LID project costs were higher than those for conventional stormwater management projects. However, in the vast majority of cases, significant savings were realized due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs.

Green roofs capture rainfall, promote evapotransporation, and offer energy savings. This is a photo of a green roof on the EPA Region 8 building in Denver, CO.

EPA has identified several additional areas that will require further study. First, in all cases, there were benefits that this study did not monetize and did not factor into the project's bottom line. These benefits include improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased total number of units developed, increased marketing potential, and faster sales. Second, more research is also needed to quantify the environmental benefits that can be achieved through the use of LID techniques and the costs that can be avoided. Examples of environmental benefits include reduced runoff volumes and pollutant loadings to downstream waters, and reduced incidences of combined sewer overflows. Finally, more research is needed to monetize the cost reductions that can be achieved through improved environmental performance, reductions in long-term operation and maintenance costs, and/or reductions in the life cycle costs of replacing or rehabilitating infrastructure.

AVAILABILITY

The full report is available for download at www.epa.gov/nps/lid.

Acknowledgements

Author:	Haan-Fawn Chau UCLA Department of Urban Planning
Principal Advisor & Reviewer:	Commissioner Paula Daniels City of Los Angeles Board of Public Works
Advisor:	Claire Bowin City of Los Angeles Department of City Planning
Contributors, Chapters 3 & 5	Reza Iranpour, Ken Weston & Hubertus Cox City of Los Angeles Bureau of Sanitation

The City of Los Angeles is grateful for the generous funding provided by the **Annenberg Foundation** which made this research project possible, and for the operational support of the **Los Angeles & San Gabriel Rivers Watershed Council.**

Thank you to **Abby Hall** of the U.S. Environmental Protection Agency for permission to use her photographs of green infrastructure projects, which can be viewed at http://picasaweb.google.com/buildgreeninfrastructure.

Reviewers

Edward Belden	Los Angeles & San Gabriel Rivers Watershed Council
Edith Ben-Horin	TreePeople
Sabrina Bornstein	UCLA Department of Urban Planning
Leigh Christy	Perkins+Will
Randall Crane	UCLA Department of Urban Planning
Bowman Cutter	Pomona College Department of Economics
Noah Garrison	Natural Resources Defense Council
Mark Gold	Heal the Bay
Alice Gong	City of Los Angeles Bureau of Sanitation
Mark Hanna	Los Angeles Department of Water & Power
Stephanie Landregan	UCLA Extension Landscape Architecture Program
Mia Lehrer	Mia Lehrer Associates
Shelley Luce	Santa Monica Bay Restoration Commission
Meredith McCarthy	Heal the Bay
Meredith McKenzie	Arroyo Seco Foundation
Stephanie Pincetl	UCLA Institute of the Environment
Drew Ready	Los Angeles & San Gabriel Rivers Watershed Council
V. Blair Seibert	Verde Concepts
Larry Smith	North East Trees
Katherine Spitz	Katherine Spitz Associates
Nancy Steele	Los Angeles & San Gabriel Rivers Watershed Council
Tracy Stone	Tracy A. Stone Architect
Stephanie Taylor	Liberty Hill Foundation / Green LA
Deborah Weinstein	TreePeople
Jennifer Wolch	USC Center for Sustainable Cities
Will Wright	American Institute of Architects
Eric Yoshida	Los Angeles Department of Water & Power
Susan Zaleski	USC Sea Grant

This Page Intentionally
Left Blank

"Policy"

Department of Public Works

~~Bureau of Engineering~~
Bureau of Sanitation
Bureau of Street Services
Joint Report No. 1

ADOPTED BY THE BOARD
PUBLIC WORKS OF THE CITY
of Los Angeles California

175327

JUL 11 2011

Executive Officer

July 11, 2011
CD Nos. All

DEPARTMENT OF PUBLIC WORKS (DPW) OFFICIAL GREEN STREET POLICY

RECOMMENDATION

Adopt the DPW official Green Street Policy as discussed below.

FISCAL IMPACT STATEMENT

There is no direct impact to the General Fund for initial capital improvement costs. Funding for the design and construction of Green Street elements will come from project funds and will typically be funded directly through available grants or special funds. Costs and funding sources for the continued operation and maintenance of Green Street elements are unknown at this time.

DISCUSSION

Background

The City of Los Angeles has approximately 6,500 miles of streets with 10,000 miles of sidewalks, 900 linear miles of alleys, and 38,000 catch basins. The vast majority of the streets are currently constructed of concrete and asphalt. In addition to carrying vehicle and pedestrian traffic, they are also part of the City's storm water conveyance system. Storm water runoff and dry weather flows captured within the City streets are either deposited into catch basins that are connected to storm drain lines or flow directly into channels, rivers, lakes and the ocean. When the storm water is not treated prior to being discharged into the receiving water bodies, pollutants, including trash, grease, oil, and sediments, are carried into receiving water bodies and eventually the ocean, causing pollution in the waterways and along the shores. Contaminated storm water runoff is the number one source of ocean pollution in Southern California, and the City's street infrastructure plays a major role in flushing these pollutants out to sea.

The City of Los Angeles is subject to a number of water quality mandates and pollutant limits in its water bodies through Total Maximum Daily Load (TMDL) requirements. TMDLs are intended to reduce pollutants of concern that are designated for each water body to restore the designated beneficial use of the water body. Compliance with these TMDLs is conducted through integrated planning that maximizes green projects such as Green Streets. The location and sizing of such projects vary depending on the source of pollutants, the soil type and availability of runoff. Integrating these projects with street improvement projects is beneficial and cost effective.

Rainwater and storm water runoff are valuable water resources. Capturing and infiltrating rainwater and storm water runoff reduces the pollution in water ways and augments water sources by infiltrating water into aquifers and groundwater. By managing runoff close to the source and maximizing infiltration, the volume of runoff will be reduced, which will help in minimizing localized flooding.

The public right-of-way provides a large area where infiltration swales or other types of pervious surfaces can be constructed to collect, retain, or detain storm water runoff. The transformation of the City's existing paved streets into Green Streets can help to alleviate many of the storm water pollution issues, and in many cases provide greener City streets and a sustainable urban environment.

A Green Street contains various elements intentionally designed and placed to treat, capture, and/or infiltrate storm water prior to its release into the standard storm drain system. Two of the more typical green street elements are a landscaped swale or a below grade infiltration or filtration trench designed to capture and infiltrate or filter storm water runoff through a natural soil profile and vegetative root system. The parkway area between the roadway and the sidewalk is one part of the street system that may be used as a location for landscaped infiltration swales or below grade infiltration galleries to increase the treatment capacity. In some cases, below grade infiltration or storage galleries can be located within the roadway area as well as within the parkway. In other cases, curb extensions, parking lanes, areas beneath sidewalks, and other suitable areas within the public right-of-way may be used to facilitate infiltration and/or storage galleries. Each of these areas within a street may be used to incorporate Green Street elements where storm water runoff can be easily and practically directed from the street into the Green Street elements.

Many of the Green Street elements employ the use of either depressed planters or below grade galleries that are capable of capturing, treating, and retaining storm water and urban runoff. They minimize the impacts of storm water runoff on the receiving water bodies by reducing the volume of polluted storm water that currently flows untreated into the City's storm drain system. They also minimize the impact of urban runoff during dry weather by diverting the low volumes of dry weather flow into Green Street elements rather than allowing the water to flow untreated into the City's storm drain system. The reduction of the storm water flow and urban runoff is achieved by allowing the storm water in the infiltration swales or galleries to percolate into the ground below and to be filtered through the soil and root matrix. Bio-swales located in parkways also provide space for street trees to mature and develop significant canopy coverage which will improve air quality as well as reduce the heat island effect from urban pavements.

Landscaped bio-swales typically consist of a depressed planter area located behind the street curb, with curb cuts located at both ends of the swales that allow water to flow from the gutter into the bio-swale and exit back into the downstream gutter during times of high volume flows. Storm water and urban runoff percolates into the ground, filtering pollutants and helping to irrigate the landscaping. Gravel and rock trenches can be incorporated below the bio-swales to increase storage capacity and infiltration. Bio-swales may also function as pre-screening devices in order to reduce the sediment loads contained in the runoff and to reduce clogging of the infiltration system. Sub-drain systems and overflow drainage may be provided to prevent flooding in the parkways.

Typical infiltration galleries consist of long trenches, usually located beneath the sidewalk or street pavement, composed of gravel and rock for the detention of storm water prior to infiltration into the ground. Perforated pipes are usually incorporated to transfer the water into the gravel and rock trench, speeding up the distribution of water into the rock and helping to increase the storage capacity of the rock matrix. Runoff is stored in the void spaces between the gravel and rocks and infiltrates into the soil matrix through a permeable liner at the bottom and sides of the trench.

In areas where soil permeability is very low, infiltration swales and galleries can be used to filter urban runoff before it reaches the storm drain system by placing perforated pipes at the bottom of a sand and gravel matrix to pick up the water after filtration has been achieved and re-depositing it back into the storm drain system.

There are other technologies available to capture pollutants in urban runoff, usually referred to as Best Management Practices (BMPs). Although some of these BMPs can have a higher long term maintenance cost than those elements mentioned above, the overall operable service life may be longer. These other technologies include:

- Pre-fabricated or custom designed storm water clarifiers installed up or downstream of standard catch basins.

- Storm water diversion structures that divert low flow urban runoff from storm drains into the sanitary sewer system or into City facilities such as parks or City parking lots, to be treated outside of the public right-of-way.

- Permeable pavement, which is more appropriate for use in parkways, parking lots or parking lanes in low volume traffic areas such as residential streets.

The Board of Public Works (BPW) adopted a Green Streets Initiative in May 2007 with the idea that the streets of Los Angeles offer an enormous opportunity to infiltrate, capture, and filter urban runoff to prevent pollution and to convert storm water into a valuable source of groundwater and recycled water. Its purpose is to promote, advance and evaluate the implementation and design of streets and parking lots to maximize the capture and infiltration of urban runoff and to create community beautification benefits.

The Green Street Initiative is an aggressive, proactive measure that aims not only to meet water quality objectives but also to address multiple beneficial uses such as infiltration to recharge groundwater aquifers, using "green" BMPs, such as landscaping to provide aesthetics as well as reducing the heat island effect, and to implement the storm water objectives as the BMPs enhance habitat and the natural environment. The Initiative aims to utilize natural landscape systems both at the surface and below-grade to capture, cleanse, and infiltrate storm water and urban runoff where storm water can be easily directed from the streets and sidewalks into the parkways.

The DPW is the lead in carrying out various action items required for this initiative, which include: preparation of design guidelines, standard plan development and adoption, development of policies, identifying priority projects, and applying for funds from various funding sources.

Developing and constructing Green Street elements, such as infiltration galleries, bio-swales, and BMPs in the public right-of-way on a regional scale will address many environmental issues within the City and will:

- Reduce the amount of storm water runoff currently flowing untreated into storm drains and natural bodies of water.
- Improve flooding conditions in some streets and intersections.
- Improve the water quality of storm water runoff that flows to the ocean.
- Increase the City's water supply by recharging local ground water basins.
- Improve air quality and reduce the heat island effect of street pavement.
- Enhance pedestrian use of sidewalks and encourage alternate means of transportation.
- Increase jobs and urban recreational opportunities.

Although the Bureaus within the DPW actively pursue funding for Green Street elements and BMPs, and implement these elements in the design of Capital Improvement Projects (CIPs) whenever feasible, there is currently no official policy adopted by the BPW regarding Green Streets within the Department.

Adopting a Green Street policy for the Department will help the City in meeting its water quality mandates, reduce storm water runoff and flooding, improve water quality, supplement the City's water supply via groundwater recharge (where applicable), improve air quality through reduction of heat island effects from street pavement, and provide a more aesthetically pleasing environment which reinforces the Board's Green Street Initiative.

The Recommendations

It is recommended that the Board adopt the following DPW official Green Street Policy:

- The Bureaus of Engineering (BOE), Sanitation (BOS) and Street Services (BSS) will pursue funding for Green Street BMPs and Green Street Elements for Public Works CIPs whenever appropriate, and will incorporate Green Street BMPs and Green

Street Elements into CIP designs whenever funding is available. All designs incorporating Green Street BMPs and Green Street Elements will be reviewed by the BOS and BSS during the pre-design phase for comments and maintenance commitments before they are included in the design and construction of a project.

- The BOE, in coordination with BSS and BOS and other City Departments, will continue to develop and adopt Green Street Standard Plans and guidelines for use in City street designs and private development.

- The BOE, in cooperation with BSS and BOS and the Los Angeles Departments of Water and Power and Transportation, will develop an annual list of prioritized CIPs that include Green Street Elements and BMPs. This list will be included in an annual report presented to the BPW in July of each year.

- The BOS will identify opportunities for green street projects that maximize the ability to improve water quality and comply with water quality mandates. The opportunities will be identified as part of the TMDL implementation plans for specific watersheds and pollutants.

- The BOS will conduct monitoring as necessary to evaluate the effectiveness of green street projects, specifically for reducing pollutants and maximizing infiltration. The monitoring results will be included in the annual report presented to the BPW each year.

- The BOE will issue this adopted policy to staff by Special Order, and will incorporate it into the Bureau's Project Delivery Manual (PDM) and the appropriate design manuals. Green Street Guidelines and Standard Plans will be referenced in the PDM and the appropriate design manuals

- The BOS will issue this adopted policy to staff by Bureau Directive and will incorporate it into BOS's Project Management Guidelines (PMG) and the appropriate design manuals and guidelines. Green Street Guidelines and Standard Plans will be referenced in the PMG and the appropriate design manuals and guidelines.

- The BSS will issue this adopted policy to staff by Bureau Directive and will incorporate the information into its regularized staff meetings and in-house training sessions with its Engineering Division supervisors and staff. Such policies will also be incorporated into BSS Engineering Division manuals and design guidelines. BSS operations staff will become familiar with departmental policies for Green Streets elements through the implementation of its projects that include Green Street elements.

(MPB TSA RMK VJ AH RO)

Report reviewed by:

BOE (ASD and PAC)

Report prepared by:

Street and Stormwater Program

Michael P. Brown, P.E., G.E.
Program Manager
Phone No. (213) 485-4523

MPB/04-2011-0086.SSD.gva

Questions regarding this
report may be referred to:
Michael P. Brown, Principal Civil Engineer
Phone No. (213) 485-4523
E-mail: Michael.Brown@lacity.org

Respectfully submitted,

Gary Lee Moore

Gary Lee Moore, P.E.
City Engineer

Enrique C. Zaldivar, P.E.
Director, Bureau of Sanitation

Nazario Sauceda
Interim Director
Bureau of Street Services

CITY OF LOS ANGELES

CALIFORNIA

WATERSHED PROTECTION DIVISION
1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939

June 27, 2013

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, California 90013

Attention: Renee Purdy

Dear Mr. Unger:

SUBMITTAL OF NOTICE OF INTENT FOR DEVELOPMENT OF ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM FOR THE SANTA MONICA BAY JURISDICTIONAL GROUPS TWO AND THREE, AND THE CITY OF LOS ANGELES AREA IN JURISDICTION GROUP SEVEN

Please find attached the Notice of Intent (NOI) for the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) for the Jurisdictional Groups 2 and 3 (J2 & J3) of the Santa Monica Bay watershed. All MS4 permittees in these Jurisdictional Groups have agreed to a collaborative approach in meeting the requirements of the new MS4 Permit by Order No. R4-2012-0175. The City of Los Angeles as lead agency for the J2 & J3 of the Santa Monica Bay watershed has prepared this NOI on behalf of itself, the County of Los Angeles, the Los Angeles County Flood Control District, and the Cities of Santa Monica and El Segundo. All agencies have reviewed and approved this NOI, and we appreciate the collaboration by all MS4 co-permittees in the preparation of the NOI documents.

Additionally, this document includes the NOI provisions associated with the City of Los Angeles' land area within Jurisdictional Group 7 of the Santa Monica Bay watershed including the facilities owned by Los Angeles County Flood Control District. The City of Los Angeles and the Los Angeles County Flood Control District have agreed to a collaborative approach in meeting the requirements of the new MS4 Permit by Order No. R4-2012-0175 for the aforementioned area.

The attached document satisfies the requirements for submitting the NOI as provided by Section VI.C.4.b of the MS4 Permit and the CIMP notification requirements as provided by Attachment E Section IV.C.1. We look forward to continuing the process of plan developments for the J2 & J3 of the Santa Monica Bay watershed with the Technical Advisory Committee, the LARWQCB, and other watershed stakeholders. Should you have any questions about this submittal, please contact me at Shahram.Kharaghani@lacity.org or phone (213) 485-0587 or your staff may contact Huub Cox at Hubertus.Cox@lacity.org or phone (213) 485-3984 or Hamid Tadayon at Hamid.Tadayon@lacity.org or phone (213) 485-3841.

Sincerely,

SHAHRAM KHARAGHANI, Ph.D., PE, BCEE
Program Manager

SK:HC:HT
WPDCR9048

Attachment

cc: Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region
Enrique Zaldivar, City of Los Angeles, Bureau of Sanitation
Adel Hagekhalil, City of Los Angeles, Bureau of Sanitation
Gary Hildebrand, County of Los Angeles, Department of Public Works
Rick Valte, City of Santa Monica
Stephanie Katsouleas , City of El Segundo

NOTICE OF INTENT

Enhanced Watershed Management Program and Coordinated Integrated Monitoring Program

Santa Monica Bay Watershed (J2, J3) and Los Angeles Area in J7

City of Los Angeles
County of Los Angeles
Los Angeles County Flood Control District
City of Santa Monica
City of El Segundo

June 27, 2013

This Page is Intentionally Left Blank

TABLE OF CONTENTS

Background

A. Notice of Intent for EWMP and CIMP for Santa Monica Bay Jurisdictional Groups 2 and 3 1

1. Introduction 1
2. Notification of Intent (Section VI.C.4.b.i and Attachment E Section IV.C.1.) 1
3. Interim and final TMDL compliance deadlines (Section VI.C.4.b.ii) 2
4. Geographical scope (Section VI.C.4.b.iii.(1)) 2
5. Plan concept (Section VI.C.4.b.iii.(1)) 3
6. Cost estimate (Section VI.C.4.b.iii.(2)) 4
7. Memorandum of Understanding (Section VI.C.4.b.iii.(3)) 4
8. Interim milestones and deadlines for plan development (section VI.C.4.b.iii.(4)) 4
9. Structural BMP (Section VI.C.4.b.iii.(5)) 5
10. LID ordinance (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1)) 5
11. Green street polices (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2)) 6
12. Implementation of watershed control measures during plan development (Sections VI.C.4.b.ii) 6

TABLE OF CONTENTS

Attachment A.1. J2 and J3 of the Santa Monica Bay watershed and MS4 permittees. 8

Attachment A.2. Open space in J2& J3 of the Santa Monica Bay watershed. 9

Attachment A.3. Final Draft Memorandum of Understanding 12

Attachment A.4. Letters of Intent 26

Attachment A.5. Proposed Structural Project 34

Attachment A.6. LFDs Along J2 and J3 Shoreline 34

TABLE OF CONTENTS

B. Notice of Intent for EWMP and CIMP for City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7 36

1. Introduction 36
2. Notification of Intent (Section VI.C.4.b.i and Attachment E Section IV.C.1.) 36
3. Interim and final TMDL compliance deadlines (Section VI.C.4.b.ii) 37
4. Geographical scope (Section VI.C.4.b.iii.(1)) 37
5. Plan concept (Section VI.C.4.b.iii.(1)) 38
6. Cost estimate (Section VI.C.4.b.iii.(2)) 38
7. Memorandum of Understanding (Section VI.C.4.b.iii.(3)) 38
8. Interim milestones and deadlines for plan development (section VI.C.4.b.iii.(4)) 38
9. Structural BMP (Section VI.C.4.b.iii.(5)) 39
10. LID ordinance (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1)) 39
11. Green street polices (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2)) 40
12. Implementation of watershed control measures during plan development (Sections VI.C.4.b.ii) 40

TABLE OF CONTENTS

Attachment B.1. The City of Los Angeles land area within J7 of the Santa Monica Bay Watershed.. 41

Attachment B.2. The City of Los Angeles detailed land area within J7 of the Santa Monica Bay Watershed. 42

Attachment B.3. Final Draft Memorandum of Understanding 43

Attachment B.4. Letters of Intent 54

Background

In 2002, the Los Angeles Regional Water Quality Control Board (LARWQCB) adopted the Santa Monica Bay Beaches Bacteria Total Maximum Daily Load (TMDL) to address the bacteriological water quality impairments that were found at 44 beaches along the Santa Monica Bay. Subsequently, in 2003, the Santa Monica Bay Beaches Bacteria TMDL became effective. The TMDL established seven jurisdictional groups responsible for water quality compliance along the Santa Monica Bay. The City of Los Angeles is the lead agency of Jurisdictional Group 2 (J2), and participating agencies of this group include the County of Los Angeles, City of Santa Monica, City of El Segundo, and Caltrans. The City of Santa Monica is the lead agency of Jurisdictional Group 3 (J3), and participating agencies of this group include the City of Los Angeles and Caltrans. The State of California Department of Parks and Recreation also owns land in both J2 and J3. In addition, the City of Los Angeles is a participating agency in Jurisdictional Group 7 (J7) within the San Pedro area.

Part A of the following Notice of Intent (NOI) will cover J2 and J3 while Part B will cover only the land area within J7 that is owned by the City of Los Angeles.

A. Notice of Intent for EWMP and CIMP for Santa Monica Bay Jurisdictional Groups 2 and 3

1. Introduction

The Cities of Los Angeles, Santa Monica, El Segundo, the County of Los Angeles, and the Los Angeles County Flood Control District (LACFCD), collectively the Santa Monica Bay J2 & J3 Enhanced Watershed Management Program (EWMP) Agencies, respectfully submit this Notification of Intent (NOI) to develop an EWMP for J2 and J3 of the Santa Monica Bay Watershed per Part VI.C.4.b.i of Order No. R4-2012-0175 (MS4 Permit). Additionally, this NOI includes a statement of the J2 & J3 EWMP agencies' intent to follow a Coordinated Integrated Monitoring Program (CIMP) approach.

Although the City of Santa Monica is the lead agency in J3, the City of Los Angeles will act as the lead agency for developing the EWMP and CIMP for the J2 & J3 Watershed. Development of the EWMP Work Plan, CIMP, and Final EWMP will be a collaborative process between all J2 & J3 EWMP Agencies, coordinated with the Technical Advisory Committee as well as with watershed stakeholders.

The following sections satisfy the EWMP requirements for NOI submittal as provided by Section VI.C.4.b of the MS4 Permit and the CIMP notification requirements as provided by Attachment E Section IV.C.1. Additionally, the following sections provide the LARWQCB with information on the approach that the J2 & J3 EWMP Agencies intend to follow for EWMP development.

2. Notification of Intent (Section VI.C.4.b.i and Attachment E Section IV.C.1.)

The J2 & J3 EWMP Agencies notify the LARWQCB by this NOI of their intention to collaboratively develop an EWMP for J2 and J3 of the Santa Monica Bay Watershed, and will submittal a Final Work Plan no later than 18 months after the effective date of the MS4 Permit (June 28, 2014) and a Draft EWMP Plan no later than 30 months after the effective date of the MS4 Permit (June 28, 2015).

Additionally, the J2 & J3 EWMP Agencies notify the LARWQCB by this NOI of their intention to collaboratively develop a CIMP for J2 & J3 of the Santa Monica Bay watershed, and will submit a Draft CIMP no later than 18 months after the effective date of the MS4 Permit (June 28, 2014).

3. Interim and final TDML compliance deadlines (Section VI.C.4.b.ii)

Table A.1 lists the TMDLs that have been developed for the Santa Monica Bay Watershed. The interim and final compliance deadline of Santa Monica Bay Nearshore and Offshore Debris TMDL and final compliance deadlines of other TMDLs occurring prior to the anticipated approval date of the EWMP (April 28, 2016) are included in Table A.2.

The watershed control measures that have been or will be implemented to meet the applicable interim and final trash water quality based effluent limitations (WQBELs) and other final WQBELs and receiving water limitations are described in more detail in Section 12 of this NOI submittal.

Table A.1. TMDLs applicable to Santa Monica Bay watershed

TMDL	LARWQCB Resolution Number	Effective Date and/or EPA Approval Date
Santa Monica Bay Beaches Dry Weather Bacteria TMDL (Summer and Winter Dry)	2002-004	7/15/2003
Santa Monica Bay Beaches Wet Weather Bacteria TMDL	2002-022	7/15/2003
Santa Monica Bay Nearshore and Offshore Debris TMDL	R10-010	03/20/2012
Santa Monica Bay DDTs and PCBs TMDL	NA	03/26/2012

Table A.2. Interim (debris) and final TMDL compliance deadlines prior to EWMP approval

TMDL	Milestone	Interim/Final	Deadline
Santa Monica Bay Beaches Dry Weather Bacteria TMDL	Compliance with allowable exceedance days during summer dry period	Final	07/15/2006
	Compliance with allowable exceedance days during winter dry period	Final	07/15/2009
Santa Monica Bay Nearshore and Offshore Debris TMDL	20% reduction from baseline load	Interim	03/20/2016

4. Geographical Scope (Section VI.C.4.b.iii.(1))

J2 and J3 are located in the central region of the Santa Monica Bay Watershed and are comprised of portions of the Cities of Los Angeles, Santa Monica, El Segundo, the County of Los Angeles, Caltrans, and the California State Park and Recreation. Attachment A.1 provides a map of the watershed boundaries and delineation of land areas of MS4 permittees and other entities within the watershed. Sub-watersheds within J2 and J3 include Castle Rock, Pulga Canyon, Temescal Canyon, and Santa Monica Canyon, which are mostly natural open space. In contrast, the Dockweiler and Santa

Monica subwatersheds are more urbanized with a large percentage of transportation, residential and commercial land uses.

All MS4 permittees in J2 and J3 have agreed to collectively develop the J2 & J3 EWMP which will cover all of the areas owned by the MS4 permittees within the watershed as shown in Table A.3. The MS4 permittees in J2 and J3 have no jurisdiction over the land that is owned by the State of California, Caltrans and the US Government. In addition, the area of the Chevron facility, which is located within the City of El Segundo, has also been excluded from the geographical scope of the J2 & J3 EWMP. The Chevron facility is responsible for compliance with its own NPDES permit through a comprehensive stormwater runoff implementation program and does not discharge to the MS4. All drainage infrastructures operated and maintained by the LACFCD within J2 and J3 of the Santa Monica Bay Watershed Management Area will be covered under this EWMP.

Table A.3. J2&J3 watershed land area distribution and EWMP participation

Agency	EWMP agency	Land area (acres)	% EWMP Area
City of Los Angeles	Yes	18,934.64	75.02%
County of Los Angeles	Yes	130.40	0.52%
City of Santa Monica	Yes	4,987.47	19.76%
City of El Segundo	Yes	1,185.63	4.70%
Los Angeles County Flood Control District	Yes	N/A	N/A
Area of EWMP agencies		**25,238.14**	**100%**
Caltrans	No	241.40	
Chevron	No	995.36	
State of California	No	7,885.12	
US Government	No	2.50	
Total area of J2&J3 of Santa Monica Bay watershed		**34,362.52**	

5. Plan concept (Section VI.C.4.b.iii.(1))

The J2 & J3 EWMP Agencies of the Santa Monica Bay Watershed have collectively pursued an integrated water resources approach to develop an implementation plan that would represent the most cost-effective and efficient use of resources to address the Santa Monica Bay Bacteria TMDLs. This approach focuses on beneficial use of urban runoff including groundwater infiltration at multiple points throughout the watershed, addresses multiple pollutants by which Santa Monica Bay is impaired, and incorporates enhancement of other public goals, such as water supply, recycling and storage, environmental justice, parks, greenways, and environmental education opportunities. The total area of J2 and J3 is 34,362 acres, of which approximately 49% is pervious/open space. As shown in Attachment A.2, 93% of the open space area is located within the northern sub-watersheds and approximately 7% is located within the Dockweiler subwatershed. Utilizing this opportunity, several regional multi-benefit projects have already been completed such as the Grand Boulevard Tree Wells, the Imperial Highway Sunken Median Storm Water, and the Westminster Dog Park Storm Water Best Management Practices (BMPs). Several other multi-benefit projects are also near completion such as the Penmar Water Quality Improvement and the Temescal Canyon Storm Water BMPs. The J2 & J3 EWMP will build on the existing TMDL implementation plan and identify additional regional projects to maximize opportunities for retaining all non-stormwater runoff and stormwater from the 85th percentile, 24-hour storm events as described in the MS4 permit, as well as identify additional watershed control measures for areas in the watershed that cannot be addressed by a regional project.

6. Cost estimate (Section VI.C.4.b.iii.(2))

The J2 & J3 EWMP Agencies collaboratively prepared a scope of work and cost estimate for developing the Work Plan, the CIMP and the EWMP for J2 and J3 of the Santa Monica Bay watershed. It is estimated that the cost for the Work Plan, the CIMP and the EWMP Plan development is approximately $1M. Of that, $182,000 is allocated for the Work Plan, $148,000 for development of CIMP, $436,000 for EWMP, and $234,000 for project coordination and meetings. This estimate assumes that the CIMP and EWMP will, in part, be based on the existing TMDL Coordinated Monitoring Plans and Implementation Plans. In addition, the J2 & J3 EWMP Agencies will contribute several hundred thousands of dollars in the contract administration costs and to in-kind services.

7. Memorandum of Understanding (Section VI.C.4.b.iii.(3))

Attachment A.3 includes the final draft of the Memorandum of Understanding (MOU) between the City of Los Angeles as the lead agency and the other J2 & J3 EWMP Agencies. All agencies have committed to the execution of the MOU as indicated by the signed letters of intent (Attachment A.4). The MOU will be executed no later than December 28, 2013.

8. Interim milestones and deadlines for plan development (section VI.C.4.b.iii.(4))

Table A.4 summarizes the interim milestone and deadlines for Work Plan, CIMP, and EWMP Plan development, which is based on the scope of work for developing the Work Plan, CIMP, and EWMP as agreed to by the J2 & J3 EWMP Agencies. In addition to the monthly agency coordination meetings and, coordination meetings with the Technical Advisory Committee, the schedule in Table A.4 assumes one workshop with local watershed stakeholders for each plan. Interim milestones in Table A.4 are the expected due dates of draft Technical Memoranda that will summarize the information and approaches for development of the specified components of the final Work Plan, CIMP, and EWMP Plan. It is expected that the draft technical memos will not be finalized; rather, the information presented in the memos will be revised based on comments and presented in the Work Plan, CIMP, and EWMP Plan.

Table A.4. Proposed interim milestones and deadlines for plan development

Deliverable	Milestones and Deadlines
Work Plan	
Draft Technical memos • Identification of water quality priorities • Existing and future watershed control measures, identification of potential regional projects • Reasonable assurance analysis approach • BMP selection approaches	March 2014
Draft Work Plan	April 2014
Final Work Plan submitted to the LARWQCB	June 2014
Coordinated Integrated Monitoring Program	
Draft Technical memos • Outfall and receiving water monitoring approach • Monitoring sites selection • New development and redevelopment effectiveness tracking	March 2014
Draft CIMP	April 2014
Final Draft CIMP submitted to the LARWQCB	June 2014
Enhanced Watershed Management Program	
Draft Technical memos • Approach to US EPA TMDLs, 303(d) listings, other exceedances of RWLs • Final selection of regional projects • Feasibility analyses of regional projects, customization of MCMs, identification of other BMPs • Project schedules and cost estimates	April 2015
Draft EWMP	May 2015
Final Draft EWMP submitted to the LARWQCB	June 2015

9. Structural BMP (Section VI.C.4.b.iii.(5))

The J2 & J3 EWMP Agencies are committed to the implementation of Phase II of the Penmar Water Quality Improvement Project within 30 months after the effective date (June 28, 2015) of the MS4 permit. This is a regional project that is jointly implemented by the Cities of Los Angeles and Santa Monica for the purpose of reusing collected stormwater for irrigation. This project is funded by Proposition "O", a $500M general bond program that was approved by the City of Los Angeles voters in 2004, the City of Santa Monica's Clean Beach special tax, and the State's Proposition 84. A detailed description of this project is presented in Attachment A.5.

10. LID ordinance (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1))

Table A.5 summarizes the status of Low Impact Development (LID) ordinances by the J2 & J3 EWMP Agencies. As presented in Table A.5, greater than 50% of the land area addressed by the geographical scope of the EMWP is addressed by an LID ordinance that is in place.

Table A.5. Summary of percent EWMP area addressed by LID ordinances

EWMP agency	Status LID ordinance	% EWMP area addressed by LID ordinance
City of Los Angeles	In Place	75.02
County of Los Angeles	Draft Ordinance	0.52
City of El Segundo	In Development	-
City of Santa Monica	In place	19.76
LACFCD	N/A	N/A
Total EWMP Area covered by LID Ordinance		95.30

- In Place – Permittee has adopted an LID Ordinance that is in compliance with the requirements of the MS4 Permit for its portion in the watershed. For the City of Los Angeles: its LID Ordinance became operative on May 12, 2012. The City of Los Angeles is currently amending sections of the LID Ordinance, as well as its Stormwater and Urban Runoff Pollution Control Ordinance (L.A.M.C. Chapter VI, Article 4.4) to meet all the MS4 permit requirements
- Draft Ordinance – Permittee has completed or will complete by June 28, 2013 the development of a draft LID Ordinance that is in compliance with the MS4 Permit for its portion in the watershed.
- In Development – Permittee initiated development of an LID Ordinance that is in compliance with the requirements of the MS4 Permit for its portion in the watershed.

11. Green street polices (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2))

Table A.6 summarizes the status of green street policies by the various J2 & J3 EWMP Agencies. As presented in Table A.6, greater than 50% of the land area addressed by the geographical scope of the EMWP is addressed by green streets policies that are in place.

Table A.6. Summary of percent EWMP area addressed by Green Street Policies

EWMP agency	Status of Green Street Policy	% EWMP area addressed by Green Street Policy
City of Los Angeles	In place	75.02
County of Los Angeles	Draft Policy	0.52
City of El Segundo	In Development	-
City of Santa Monica	In place	19.76
LACFCD	N/A	N/A
Total EWMP Area covered by LID Ordinance		95.30

- In Place – Permittee has adopted a Green Street Policy that is in compliance with the requirements of the MS4 Permit for its portion in the watershed.
- Draft Policy – Permittee has completed or will complete by June 28, 2013 the development of a draft Green Street Policy that is in compliance with the MS4 Permit for its portion in the watershed.
- In Development – Permittee initiated development of a Green Street Policy that is in compliance with the requirements of the MS4 Permit for its portion in the watershed.

12. Implementation of watershed control measures during plan development (Sections VI.C.4.b.ii)

The J2 & J3 EWMP Agencies have been collaborating since the development and adoption of the Santa Monica Bay Bacteria TMDLs by the LARWQCB to achieve the water quality objectives. In June 2005, the J2 & J3 EWMP Agencies submitted a comprehensive implementation plan to the LARWQCB, which included structural and institutional mitigation measures to meet the Bacteria TMDL requirements for dry and wet weather. Table A7 summarizes the control measures that have been implemented

RB-AR16557

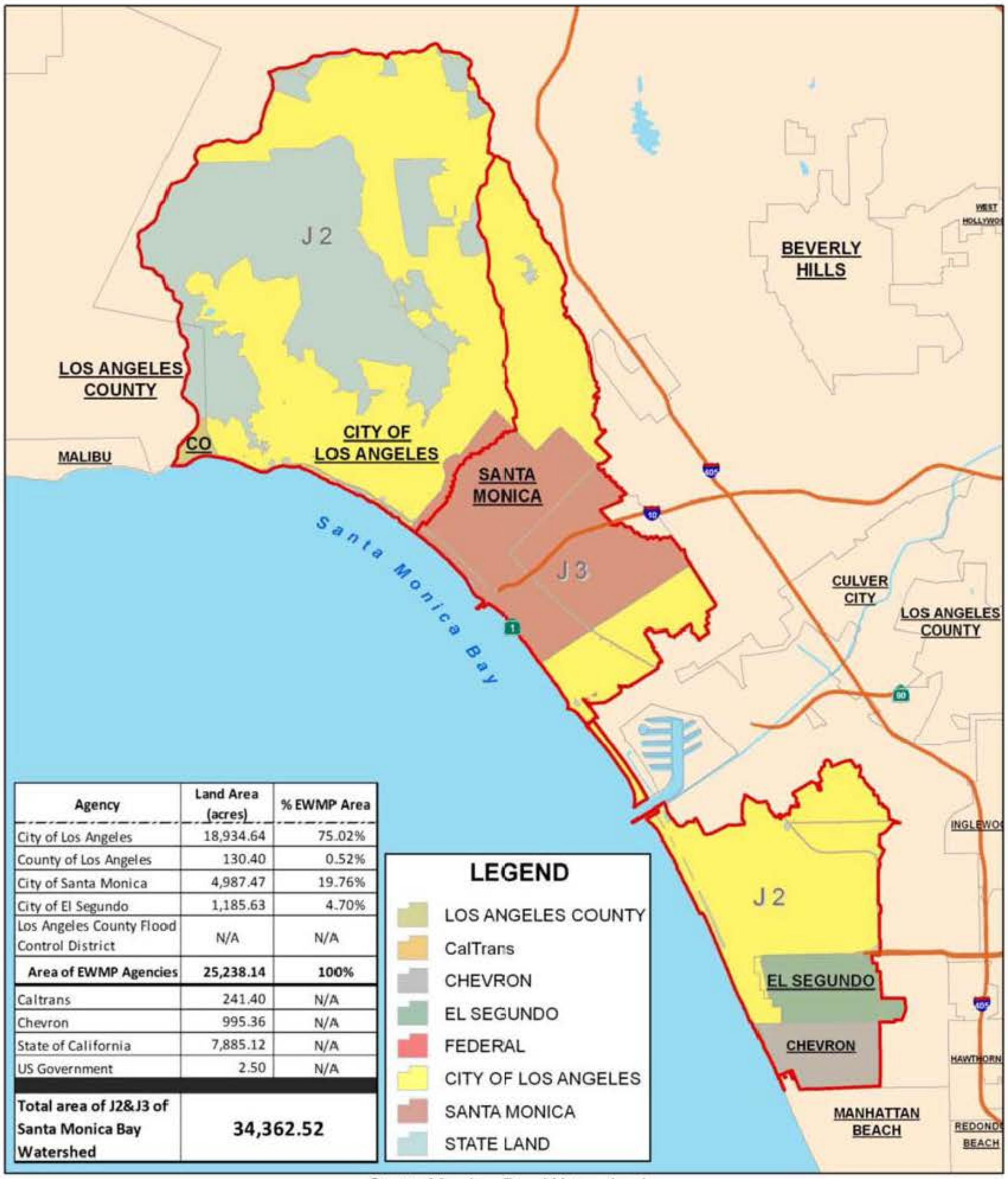
to date for the dry weather bacteria TMDL, as well as the measures that are planned for meeting the 20% interim milestone of the Santa Monica Bay Nearshore Debris TMDL.

TableA. 7. Watershed Control Measures for J2 & J3 of the Santa Monica Bay watershed

TMDL	Agencies/Permittees	Implementation Plan and Status
Dry Weather Bacteria TMDL	City of Los Angeles, City of Santa Monica, and the Los Angeles County Flood Control District	Implemented 23 Low Flow Diversions (LFD) along the Santa Monica Bay shoreline in J2 & J3 (Attachment A.6). These LFDs have been operated during summer dry weather since July 2006, and year-round during dry weather since July 2009.
	City of Santa Monica	Constructed the Santa Monica Urban Run off Recycling Facility (SMURRF) in 2001, operating year-round during dry weather.
Santa Monica Bay Nearshore and Offshore Debris TMDL	City of Los Angeles	By September 2013, will submit Plastic Monitoring and Reporting Plan (PMRP) for plastic pellets. By March 2016, will retrofit 57 Catch Basins to achieve 20% trash reduction.
	County of Los Angeles	By September 2013, will submit PMRP for plastic pellets. By 2014, will retrofit 41 catch basins in unincorporated area to achieve 100% trash reduction
	City of Santa Monica	Retrofitted 100s of catch basin screens and inserts and installed 5 Continuous Deflection System (CDS) units. By 2015, will install additional 3 CDS units and retrofit dozens of full capture catch basin inserts for the Pico-Kenter sub-watershed

Aside from the above watershed control measures, the J2 & J3 EWMP Agencies have utilized a multi-pollutant and multi-benefit approach to develop the Bacteria TMDL Implementation Plan with structural and institutional watershed control measures, as well as timelines for implementation to meet the receiving water limitations of the Bacteria TMDL. This final plan was submitted on June 16, 2005 and developed by the following agencies: the City of Los Angeles, the County of Los Angeles, the City of Santa Monica, the City of El Segundo, and Caltrans.

Attachment A.1. J2 and J3 of the Santa Monica Bay watershed and MS4 permittees.



Agency	Land Area (acres)	% EWMP Area
City of Los Angeles	18,934.64	75.02%
County of Los Angeles	130.40	0.52%
City of Santa Monica	4,987.47	19.76%
City of El Segundo	1,185.63	4.70%
Los Angeles County Flood Control District	N/A	N/A
Area of EWMP Agencies	**25,238.14**	**100%**
Caltrans	241.40	N/A
Chevron	995.36	N/A
State of California	7,885.12	N/A
US Government	2.50	N/A
Total area of J2&J3 of Santa Monica Bay Watershed	**34,362.52**	

Santa Monica Bay Watersheds
Jurisdiction 2-3 Agencies

BUREAU OF SANITIATION

ENRIQUE C. ZALDIVAR
DIRECTOR

SHAHRAM KHARAGHANI
PROGRAM MANAGER

DRAWN BY | CHECKED BY | DATE | DATE REVISED

This map shall not be copied or reproduced, all or any part thereof, whether for distribution or resale without the proper written permission of the Dept. of Public Works, City of Los Angeles

WATERSHED PROTECTION DIVISION

RB-AR16559

Attachment A.2. Open space in J2& J3 of the Santa Monica Bay watershed.

RB-AR16560

Attachment A.3. Final Draft Memorandum of Understanding.

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE CITY OF LOS ANGELES, THE CITY OF SANTA MONICA, THE CITY OF ELSEGUNDO, LOS ANGELES COUNTY FLOOD CONTROL DISTRICT, AND THE COUNTY OF LOS ANGELES

REGARDING THE ADMINISTRATION AND COST SHARING FOR DEVELOPMENT OF THE ENHANCED WATERSHED MANAGEMENT PROGRAM FOR THE JURISDICTIONAL GROUPS 2 & 3 OF THE SANTA MONICA BAY WATERSHED

This Memorandum of Understanding (MOU) is made and entered into as of the date of the last signature set forth below by and between the City of Los Angeles, a municipal corporation, the Los Angeles County Flood Control District (LACFCD), a political subdivision of the State of California, the County of Los Angeles, a political subdivision of the State of California, the City of Santa Monica, a municipal corporation, and the City of El Segundo, a municipal corporation. Collectively, these entities shall be known herein as "Parties" or individually as "Party."

WITNESSETH

WHEREAS, the Regional Water Quality Control Board, Los Angeles Region (Regional Board) adopted National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Order No. R4-2012-0175 (MS4 Permit); and

WHEREAS, the MS4 Permit became effective on December 28, 2012 and requires that the LACFCD, County of Los Angeles, and 84 of the 88 cities (excluding Avalon, Long Beach, Palmdale, and Lancaster) within the County of Los Angeles comply with the prescribed elements of the MS4 Permit; and

WHEREAS, the MS4 Permit identified the Parties as the MS4 permittees that are responsible for compliance with the MS4 Permit requirements pertaining to Jurisdiction Groups 2 and 3 in the Santa Monica Bay Watershed Management Area; and

WHEREAS, the Parties have agreed to collaborate on the development of an Enhanced Watershed Management Program (EWMP) for Jurisdiction Groups 2 and 3 of the Santa Monica Bay Watershed Management Area to comply with certain elements of the MS4 Permit; and

WHEREAS, the PARTIES agree that each shall assume full and independent responsibility for ensuring its own compliance with the MS4 Permit despite the collaborative approach of this MOU; and WHEREAS, the development of an EWMP includes the preparation of a Work Plan, a draft and final Coordinated Integrated Monitoring Plan ("CIMP"), and a draft and final Enhanced Watershed Management Program ("EWMP Plan"), collectively referred to herein as "Plans"; and

WHEREAS, the Parties collaboratively prepared a final Scope of Work and Request for Proposal to obtain a Consultant for preparing the Plans that will satisfy the requirements of the MS4 Permit; and

WHEREAS, the PARTIES have determined that hiring a Consultant to prepare and deliver the PLANS will be beneficial to the PARTIES and they desire to participate and will provide funding in accordance with the cost allocation formula shown in Table (3) of Exhibit A; and

WHEREAS, the Parties have agreed that the total cost for developing the Plans shall not exceed $1,050,000 including the project administration and management cost; and

WHEREAS, the Parties have agreed to retain the City of Los Angeles to coordinate the services of a Consultant to develop the Plans, the Parties have agreed to share in the cost and pay the City of Los Angeles for these consultant services as provided by Exhibit A of this MOU, and the City of Los Angeles has agreed to act on behalf of all Parties in the preparation of the Plans and the coordination of the consultant services;

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the Parties, and of the promises contained in this MOU, the PARTIES agree as follows:

Section 1. Recitals: The recitals set forth above are incorporated into this MOU.

Section 2. Purpose: The purpose of this MOU is to cooperatively fund the preparation and submittal of the Plans to the Regional Board.

Section 3. Cooperation: The Parties shall fully cooperate with one another to attain the purpose of this MOU.

Section 4. Voluntary: This MOU is voluntarily entered into for the purpose of preparing and submitting the Plans to the Regional Board.

Section 5. Term: Term: This MOU shall become effective on the last date of execution by the Parties or December 28, 2013, whichever comes first, and shall remain and continue to remain in effect until June 30, 2016. If a Party does not execute this MOU by December 28, 2013, that Party shall be excluded from this MOU and this MOU shall become effective on December 28, 2013 by execution by the remaining Parties.

Section 6. Assessment for Proportional Cost: The Parties agree to pay the City of Los Angeles for preparation and delivery of the Plans in the amounts shown in Table (4) of Exhibit A, based on the total costs shown in Tables (1) and (2) and the cost allocation formula shown in Table (3) of Exhibit A, attached hereto and made part of this MOU by this reference. The City of Los Angeles will invoice the Parties in two installments upon execution of this MOU as shown in Table (4) of Exhibit A, based on the allocated costs for developing the Plan and the project administration and management costs at a percentage not to exceed 5% of the allocated costs for development of the Plan. At the end of each fiscal year, the City of Los Angeles will provide the Agencies with a statement with the actual expenditures. Unexpended funds at the termination of this MOU will be reimbursed to the Parties in accordance with the cost allocation formula set forth in Table (3) of Exhibit A

Section 7. City of Los Angeles agrees:

a. To solicit proposals for, award and administer a Consultant contract for the preparation and delivery of the Plans. The City of Los Angeles will be compensated for the administration and management of the Consultant contract as described in Exhibit A.

b. To utilize the funds deposited by the Parties only for the administration of the Consultant contract, project management, and the preparation and completion of the Plans.

c. To provide the Parties with an electronic copy of the technical memos, draft Plans and completed Plans within 7 business days of receipt from the Consultant.

d. To invoice the Parties in the amounts and according to the schedule shown in Table (4) of Exhibit A.

e. To provide an accounting within 90 days at the termination of this MOU or within 90 days after the early termination of the MOU pursuant to Section 11. The City of Los Angeles shall return the unused portion of all funds deposited with the City of Los Angeles in accordance with the cost allocation formula set forth in table (3) of Exhibit A.

Section 8. The Parties further agree:

a. To make a full faith effort to cooperate with one another to achieve the purposes of this MOU by providing information about project opportunities, reviewing deliverables in a timely manner, and informing administration, and/or governing body.

b. To fund the cost of the preparation and delivery of the Plans and to pay the City of Los Angeles for the preparation and delivery of the Plans based on the cost allocation shown in Table (3) of Exhibit A. This includes the costs incurred by the City of Los Angeles for administering the Consultant services between awarding the Consultant contract and the execution of this MOU

c. To grant access rights and entry to the City of Los Angeles and the Consultant during the terms of this MOU to the Parties' facilities (i.e. storm drains, channels, catch basins, properties, etc.) ("Facilities") to achieve the purposes of this MOU. Prior to exercising said right of entry, the City of Los Angeles or their Consultant shall provide written notice to the Parties at least 48 hours in advance. For the purposes of this provision, written notice shall include notice delivered via e-mail that has been delivered to the Parties' representatives identified in Exhibit B.

Section 9. Invoice and Payment

a. Payment: The Parties shall pay the City of Los Angeles their proportional share of the cost for the preparation and delivery of the Plans and project administration and management as shown in Table (4) of Exhibit A. Payments are due within sixty (60) days of receiving the invoice from the City of Los Angeles.

b. Invoice: The City of Los Angeles will invoice Parties in two installments in the amounts shown in Table (4) of Exhibit A. The first invoice will be sent upon execution of this MOU or in January 2014, whichever comes first. The second invoice will be sent in July 2014.

c. Contingency: The City of Los Angeles will notify the Parties if actual expenditures are anticipated to exceed the cost estimates contained in Exhibits A and obtain approval of such expenditures from all Parties. Upon approval, the Parties agree to reimburse the City of Los Angeles for their proportional share of these additional expenditures at an amount not to exceed 10% of the original cost estimate as shown in Exhibit A. This 10% contingency will not be invoiced, unless actual expenditures exceed the original cost estimate. Expenditures that exceed the 10% contingency will require an amendment of this MOU.

Section 10. Indemnification

Each Party shall indemnify, defend, and hold harmless each other Party, including its special districts, elected and appointed officers, employees, and agents, from and against any and all liability, including but not limited to demands, claims, actions, fees, costs, and expenses (including attorney and expert witness fees), arising from or connected with the respective acts of each Party arising from or related to this MOU; provided, however, that no party shall indemnify another party for that party's own negligence or willful misconduct.

In light of the provisions of Section 895.2 of the Government Code of the State of California imposing certain tort liability jointly upon public entities solely by reason of such entities being parties to an agreement (as defined in Section 895 of said Code), each of the Parties hereto, pursuant to the authorization contained in Section 895.4 and 895.6 of said Code, shall assume the full liability imposed upon it or any of its officers, agents, or employees, by law for injury caused by any act or omission occurring in the performance of this MOU to the same extent that such liability would be imposed in the absence of Section 895.2 of said Code. To achieve the above stated purpose, each Party indemnifies, defends, and holds harmless each other Party for any liability, cost, or expense that may be imposed upon such other Party solely by virtue of said Section 895.2. The provisions of Section 2778 of the California Civil Code are made a part hereof as if incorporated herein.

Section 11. Termination

a. This MOU may be terminated upon the express written agreement of all Parties. If this MOU is terminated, all Parties must agree on the equitable redistribution of remaining funds deposited, if there are any, or payment of invoices due at the time of termination. Completed work shall be owned by all Parties. Rights to uncompleted work by the Consultant still under contract will be held by the Party or Parties who fund the completion of such work.

b. If a Party fails to comply with any of the terms or conditions of this MOU, that Party shall forfeit its rights to the work completed through this MOU, but no such forfeiture shall occur unless and until the defaulting PARTY has first been given notice of its default and a reasonable opportunity to cure the alleged default.

Section 12. General Provisions

a) Notices. Any notices, bills, invoices, or reports relating to this MOU, and any request, demand, statement or other communication required or permitted hereunder shall be in writing and shall be delivered to the Representative of the Party at the address set forth in Exhibit B. Parties shall promptly notify each other of any change of contact information, including personnel changes, provided in Exhibit B. Written notice shall include notice delivered via email or fax. A notice shall be deemed to have been received on (a) the date of delivery, if delivered by hand during regular business hours, or by confirmed facsimile or by email; or (b) on the third (3) business day following mailing by registered or certified mail (return receipt requested) to the addresses set forth in Exhibit B.

b) Administration. For the purpose of this MOU, the parties hereby designate as their respective Party Representatives the persons named in Exhibit B. The designated Party Representatives, or their respective designees, shall administer the terms and conditions of this MOU on behalf of their respective Party. Each of the persons signing below on behalf of a Party represents and warrants that they are authorized to sign this MOU on behalf of such Party.

c) Relationship of Parties. The Parties are and shall remain at all times as to each other, wholly independent entities. No Party to this MOU shall have power to incur any debt, obligation, or liability on behalf of another Party unless expressly provided to the contrary by this MOU. No employee, agent, or officer of a Party shall be deemed for any purpose whatsoever to be an agent, employee or officer of another Party.

d) Binding Effect. This MOU shall be binding upon and inure to the benefit of each Party to this MOU and their respective heirs, administrators, representatives, successors and assigns.

e) Amendment. The terms and provisions of this MOU may not be amended, modified, or waived, except by an instrument in writing signed by all the Parties. This section applies to, but is not limited to, amendments proposed to address regulatory changes in the MS4 permit, modifications to the Scope of Work, or changes in the number of Parties to this MOU. For the City of Los Angeles, the Director of Bureau of Sanitation or his/her designee is authorized to execute such amendments.

f) Waiver. Waiver by any Party to this MOU of any term, condition, or covenant of this MOU shall not constitute a waiver of any other term, condition, or covenant. Waiver by any Party to any breach of the provisions of this MOU shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this MOU.

g) Law to Govern; Venue. This MOU shall be interpreted, construed and governed according to the laws of the State of California. In the event of litigation between the Parties, venue in the state trial courts shall lie exclusively in the County of Los Angeles.

h) No Presumption in Drafting. The Parties to this MOU agree that the general rule that an MOU is to be interpreted against the Party drafting it, or causing it to be prepared shall not apply.

i) Entire Agreement. This MOU constitutes the entire agreement of the Parties with respect to the subject matter hereof and supersedes all prior or contemporaneous agreements, whether written or oral, with respect thereto.

j) Severability. If any term, provision, condition or covenant of this MOU is declared or determined by any court or competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this MOU shall not be affected thereby and this MOU shall be read and constructed without the invalid, void, or unenforceable provision(s).

k) Counterparts. This MOU may be executed in any number of counterparts, each of which shall be an original, but all of which taken together shall constitute but one and the same instrument, provided, however, that such counterparts shall have been delivered to all Parties to this MOU.

l) All Parties have been represented by counsel in the preparation and negotiation of this MOU. Accordingly, this MOU shall be construed according to its fair language.

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed by their duly authorized representatives and affixed as of the date of signature of the Parties:

CITY OF LOS ANGELES

Date: ____________________ By: __________________

Capri W. Maddox, President

Board of Public Works

ATTEST:

By: _____________________

June Lagmay

City Clerk

APPROVED AS TO FORM:

Carmen Trutanich

City Attorney

By: __________________

John A. Carvalho

Deputy City Attorney

COUNTY OF LOS ANGELES

By ______________________________ ____________________
GAIL FARBER Date

APPROVED AS TO FORM:

John F. Krattli
County Counsel

By ______________________________ ____________________
Deputy Date

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By ________________________
Chief Engineer

APPROVED AS TO FORM:

John F. Krattli
County Counsel

By ______________________________________ ________________________
Deputy Date

CITY OF SANTA MONICA

Date: ___________________ By: ___________________________
Rod Gould, City Manager

ATTEST:

By: ___________________________
Sarah P. Goran
City Clerk

APPROVED AS TO FORM:

By:
____
Marsha Jones Moutrie,
City Attorney

CITY OF EL SEGUNDO

________________________________ Date: ________________________
Greg Carpenter
City Manager

ATTEST:

____
Tracy Weaver,
City Clerk

APPROVED AS TO FORM:
MARK D. HENSLEY, City Attorney

By: ________________________________
Karl H. Berger,
Assistant City Attorney

EXHIBIT A

Santa Monica Bay Watershed
Jurisdictional Groups 2&3
EWMP
Funding Contributions

Table 1. Consultant Contract Costs

Deliverable	Deliverable Due Date	Cost
Work Plan	June 28, 2014	$ 182,000
CIMP	June 28, 2014	$ 148,000
EWMP Plan	June 28, 2015 (draft plan) April 28, 2016 (final plan)	$ 436,000
Project Management Coordination & Meetings	On going	$234,000
Contract Cost	-	**$ 1,000,000**

Table 2. Total Cost

Item	Cost
Consultant Contract	$1,000,000
Project Administration & Management (5%)*	$50,000
Total Cost	**$1,050,000**
Flood Control District Contribution (10%)	-$105,000
Cost for area cost sharing	**$945,000**

Table 3. Cost Allocation Formula for Area Cost Sharing

Party	Acres	Percent of Area[1]	Total Cost
County of Los Angeles	130.40	**0.52%**	$4,914
City of Santa Monica	4,987.47	**19.76%**	$186,732
City of El Segundo	1,185.63	**4.70%**	$44,415
City of Los Angeles	18,934.64	**75.02%**	$708,939
Total	25,238.14	**100%**	**$945,000**

[1]Areas owned by Caltrans, State Parks, Chevron, and U.S. Government have been excluded from the total area of Jurisdictional Groups 2 and 3.

RB-AR16573

Table 4. City of Los Angeles Invoicing Schedule and Invoice Amounts to Parties

Invoice Date[1]	LACFCD Invoice	County of Los Angeles Invoice	City of Santa Monica Invoice	City of El Segundo Invoice
January 2014	$52,500	$2,457	$93,366	$22,208
July 2014	$52,500	$2,457	$93,366	$23,208
Total Invoice Amount[1]	**$105,000**	**$4,914**	**$186,732**	**$44,415**
10% Contingency	$10,500	$491	$18,673	$4,442
Total including 10% contingency	**$115,500**	**$5,405**	**$205,405**	**$48,857**

[1]Contingency is 10% of the total estimated cost. Contingency will not be invoiced unless there is a need for its expenditure as agreed by all Parties.

EXHIBIT B

Santa Monica Bay Watershed
Jurisdictional Groups 2&3
Responsible Agencies Representatives

1. City of Los Angeles
   Department of Public Works
   Bureau of Sanitation, Watershed Protection Division
   1149 S. Broadway
   Los Angeles, CA 90015

   Shahram Kharaghani
   E-mail: Shahram.Kharaghani@Lacity.org
   Phone: (213) 485-0587
   Fax: (213) 485-3939

2. County of Los Angeles
   Department of Public Works
   Watershed Management Division, 11th Floor
   900 South Fremont Avenue
   Alhambra, CA 91803-1331

   Gary Hildebrand
   E-mail: GHILDEB@dpw.lacounty.gov
   Phone: (626) 458-4300
   Fax: (626) 457-1526

3. Los Angeles County Flood Control District
   Department of Public Works
   Watershed Management Division, 11th Floor
   900 South Fremont Avenue
   Alhambra, CA 91803-1331

   Gary Hildebrand
   E-mail: GHILDEB@dpw.lacounty.gov
   Phone: (626) 458-4300
   Fax: (626) 457-1526

4. City of Santa Monica
   Public Works Department
   Civil Engineering Division
   1437 4th Street, Suite 300
   Santa Monica, CA 90401

   Rick Valte
   E-Mail: rick.valte@smgov.net
   Pjone: (310)458-8234
   Fax: (310) 393-4425

5. City of El Segundo
   Department of Public Works
   350 Main Street
   El Segundo, CA 90245-3813

   Stephanie Katsouleas
   E-mail: skatsouleas@elsegundo.org
   Phone: (310)524-2356
   Fax: (310)640-0489

Attachment A.4. Letters of Intent.

CITY OF LOS ANGELES
CALIFORNIA

ANTONIO R. VILLARAIGOSA
MAYOR

BUREAU OF SANITATION
ENRIQUE C. ZALDIVAR
DIRECTOR
TRACI J. MINAMIDE
CHIEF OPERATING OFFICER
VAROUJ S. ABKIAN
ADEL H. HAGEKHALIL
ALEXANDER E. HELOU
ASSISTANT DIRECTORS
NEIL M. GUGLIELMO
ACTING CHIEF FINANCIAL OFFICER
WATERSHED PROTECTION DIVISION
1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939

June 27, 2013

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, California 90013

Attention: Renee Purdy

Dear Mr. Unger:

CITY OF LOS ANGELES COMMITMENT TO PARTICIPATE IN AND SHARE THE COST FOR DEVELOPMENT OF ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM FOR THE SANTA MONICA BAY WATERSHED (JURISDICTIONAL GROUPS 2 AND 3)

The City of Los Angeles submits this letter of intent with our commitment to participate in and share the cost for the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) for Jurisdictional Groups 2 and 3 (J2 and J3) of the Santa Monica Bay watershed as outlined in the Notice of Intent submitted by the City of Los Angeles to meet the requirements of Part VI.C.4.b of the MS4 Permit (Order No. R4-2012-0175) and the CIMP notification requirements specified in Attachment E Section IV.C.1.

The J2 and J3 of the Santa Monica Bay Watershed Group consist of the following MS4 Permittees: the City of Los Angeles (lead agency for EWMP and CIMP development), the County of Los Angeles, Los Angeles County Flood Control District, the City of Santa Monica, and the City of El Segundo. The final draft agreement to fund program development by the Santa Monica Bay J2 and J3 Watershed Groups has been included in the Notice of Intent and the City of Los Angeles is committed to execute this agreement prior to December 28, 2013.

Should you have any questions regarding this correspondence, please contact me at Shahram.Kharaghani@lacity.org or phone (213) 485-0587 or your staff may contact Huub Cox at Hubertus.Cox@lacity.org or phone (213) 485-3984 or Hamid Tadayon at Hamid.Tadayon@lacity.org or (213) 485-3841.

Sincerely,

SHAHRAM KHARAGHANI, Ph.D., P.E., BCEE
Program Manager

SK:HC:HT
WPDCR9042

Sam Unger, Executive Officer
City of Los Angeles Letter of Intent for J2 and J3 Santa Monica Bay Watershed
June 27, 2013
Page 2

cc: Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region
Enrique Zaldivar, City of Los Angeles, BOS
Adel Hagekhalil, City of Los Angeles, BOS
Gary Hildebrand, County of Los Angeles
Rick Valte, City of Santa Monica
Stephanie Katsouleas, City of El Segundo

City of
Santa Monica®

Office of the City Manager
1685 Main Street
PO Box 2200
Santa Monica, California 90407-2200

June 17, 2013

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, California 90013

Attention: Renee Purdy

CITY OF SANTA MONICA COMMITMENT TO PARTICIPATE IN AND SHARE THE COST FOR DEVELOPMENT OF ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM FOR THE JURISDICTIONAL GROUPS 2 AND 3 (J2 and J3) OF THE SANTA MONICA BAY WATERSHED

Dear Mr. Unger;

The CITY OF SANTA MONICA submits this letter of intent with our commitment to participate in and share the cost for the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) for J2 and J3 of the Santa Monica Bay watershed as outlined in the Notice of Intent submitted by the City of Los Angeles to meet the requirements of Part VI.C.4.b of the MS4 Permit (Order No. R4-2012-0175) and the CIMP notification requirements specified in Attachment E Section IV.C.1.

The J2 and J3 of the Santa Monica Bay Watershed Group consists of the following MS4 Permittees: the City of Los Angeles (lead agency for EWMP and CIMP development), the County of Los Angeles, Los Angeles County Flood Control District, the City of Santa Monica, and the City of El Segundo. The final draft agreement to fund program development by J2 and J3 of the Santa Monica Bay Watershed Group has been included in the Notice of Intent and the CITY OF SANTA MONICA is committed to execute this agreement prior to December 28, 2013.

tel: 310 458-8301 • fax: 310 917-6640

Should you have any questions regarding this correspondence, please contact Rick Valte at (310) 458-8234.

Sincerely,

ROD GOULD
City Manager

cc:
Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region
Shahram Kharaghani, City of Los Angeles
Gary Hildebrand, County of Los Angeles
Rick Valte, City of Santa Monica
Stephanie Katsouleas, City of El Segundo

City of El Segundo

Public Works Department
Stephanie Katsouleas, Director

June 5, 2013

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, California 90013

THE CITY OF EL SEGUNDO'S COMMITMENT TO PARTICIPATE IN AND SHARE THE COST FOR DEVELOPMENT OF ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM FOR THE JURISDICTIONAL GROUPS 2 AND 3 (J2 and J3) OF THE SANTA MONICA BAY WATERSHED

Dear Mr. Unger;

The City of El Segundo submits this letter of intent with our commitment to participate in and share the cost for the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) for J2 and J3 of the Santa Monica Bay watershed as outlined in the Notice of Intent. The NOI will be submitted by the City of Los Angeles to Regional Board to meet the requirements of Part VI.C.4.b of the MS4 Permit (Order No. R4-2012-0175) and the CIMP notification requirements specified in Attachment E Section IV.C.1.

The J2 and J3 watershed groups of the Santa Monica Bay watershed consists of the following MS4 Permittees: the City of Los Angeles (lead agency for EWMP and CIMP development), the County of Los Angeles, Los Angeles County Flood Control District, the City of Santa Monica, and the City of El Segundo. The final draft agreement to fund program development by J2 and J3 groups of the Santa Monica Bay watershed is included in the Notice of Intent. The City of El Segundo is committed to executing this agreement prior to December 28, 2013.

Should you have any questions, please contact me at (310)524-2356 or vial email to skatsouleas@elsegundo.org, or Lifan Xu, of my staff, at (310)524-2368 or via email to lxu@elsegundo.org.

Sincerely

Stephanie Katsouleas

Stephanie Katsouleas
Director of Public Works

Cc: Greg Carpenter, City Manager

350 Main Street, El Segundo, California 90245-3813
Phone (310)524-2300 Fax (310) 640-0489

Lifan Xu, Principal Civil Engineer
Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region
Shahram Kharaghani, City of Los Angeles, Department of Public Works
Gary Hildebrand, County of Los Angeles, Department of Public Works
Rick Valte, City of Santa Monica

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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

GAIL FARBER, Director

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

IN REPLY PLEASE
REFER TO FILE: WM-7

June 24, 2013

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

Attention Ms. Renee Purdy

Dear Mr. Unger:

**LETTER OF INTENT – COUNTY OF LOS ANGELES
SANTA MONICA BAY WATERSHED JURISDICTIONAL GROUPS 2 AND 3
ENHANCED WATERSHED MANAGEMENT PROGRAM
AND COORDINATED INTEGRATED MONITORING PROGRAM**

The County of Los Angeles (County) submits this Letter of Intent to participate in and share the cost of the development of an Enhanced Watershed Management Program (EWMP) and a Coordinated Integrated Monitoring Program (CIMP) for Jurisdictional Groups 2 and 3 of the Santa Monica Bay Watershed. This Letter of Intent serves to satisfy the EWMP notification requirements of Section VI.C.4.b.iii(3) of Order No. R4-2012-0175 (Municipal Separate Storm Sewer System Permit) and the CIMP requirements of Section IV.C.1 of Attachment E of the Municipal Separate Storm Sewer System Permit.

The Santa Monica Bay Watershed Jurisdictional Groups 2 and 3 EWMP agencies consist of the following: City of Los Angeles as the coordinating agency for EWMP and CIMP development, County, Los Angeles County Flood Control District, and cities of El Segundo and Santa Monica. The Santa Monica Bay Watershed Jurisdictional Groups 2 and 3 EWMP agencies have included a final draft Memorandum of Understanding as Attachment A.3 of the Notice of Intent. The County intends to submit a final Memorandum of Understanding to its Board of Supervisors for approval prior to December 28, 2013.

RB-AR16583

Mr. Samuel Unger
June 24, 2013
Page 2

If you have any questions, please contact Ms. Angela George at (626) 458-4325 or ageorge@dpw.lacounty.gov.

Very truly yours,

for GAIL FARBER
Director of Public Works

RP:jht
P:\wmpub\Secretarial\2013 Documents\Letter\LOI Santa Monica Bay J 2&3 County.doc\C13224

cc: City of El Segundo
City of Los Angeles
City of Santa Monica

Attachment A.5. Proposed Structural Project.

Penmar Water Quality Improvement Project

Project Description

This project is implemented in two phases.

Phase I consist of:

- A storm water diversion structure which taps into an 18 ft wide and 12 ft tall double box storm drain under Rose Ave.
- A pump station to lift and convey the storm water to a detention tank
- A 2.75 million gallon detention tank under the Penmar Park.
- Conveyance pipes and pumps to convey detained storm water to the sewer system for treatment at Hyperion Treatment Plant.

The dry weather storm water run off and first flush flow during the rain events is diverted into the detention tank at 11,000 gallon per minute for 4 hours where it is held for 72 hours prior to discharge into the sewer system.

Phase II includes of:

- An on site treatment system following the detention tank to disinfect and treat the harvested storm water to the required water quality standards for irrigation and reuse application
- An irrigation system to deliver the water to the City of Santa Monica near by Marin Park.

Project Location and Drainage Area

This project is located at Penmar Parks and recreation center, one mile from the beach at 1341 Lake Street within the Santa Monica Bay watershed. The Park features an attractive landscape with baseball diamonds tennis courts and children play area. The project captures dry and wet weather runoff from a drainage area of 1,500 acres from the City of Los Angeles, and the City of Santa Monica. The service area of the project is predominately light commercial, industrial, and high density single family land use.

Project Benefits

Project benefits include;

- Restoration of beneficial use of the Santa Monica Bay through bacteria removal from the run off
- Reduce incidents of Beach Closures
- Improve public health,
- Improve marine and aquatic habit
- Improve compliance with the Santa Monica Bay Bacteria TMDL

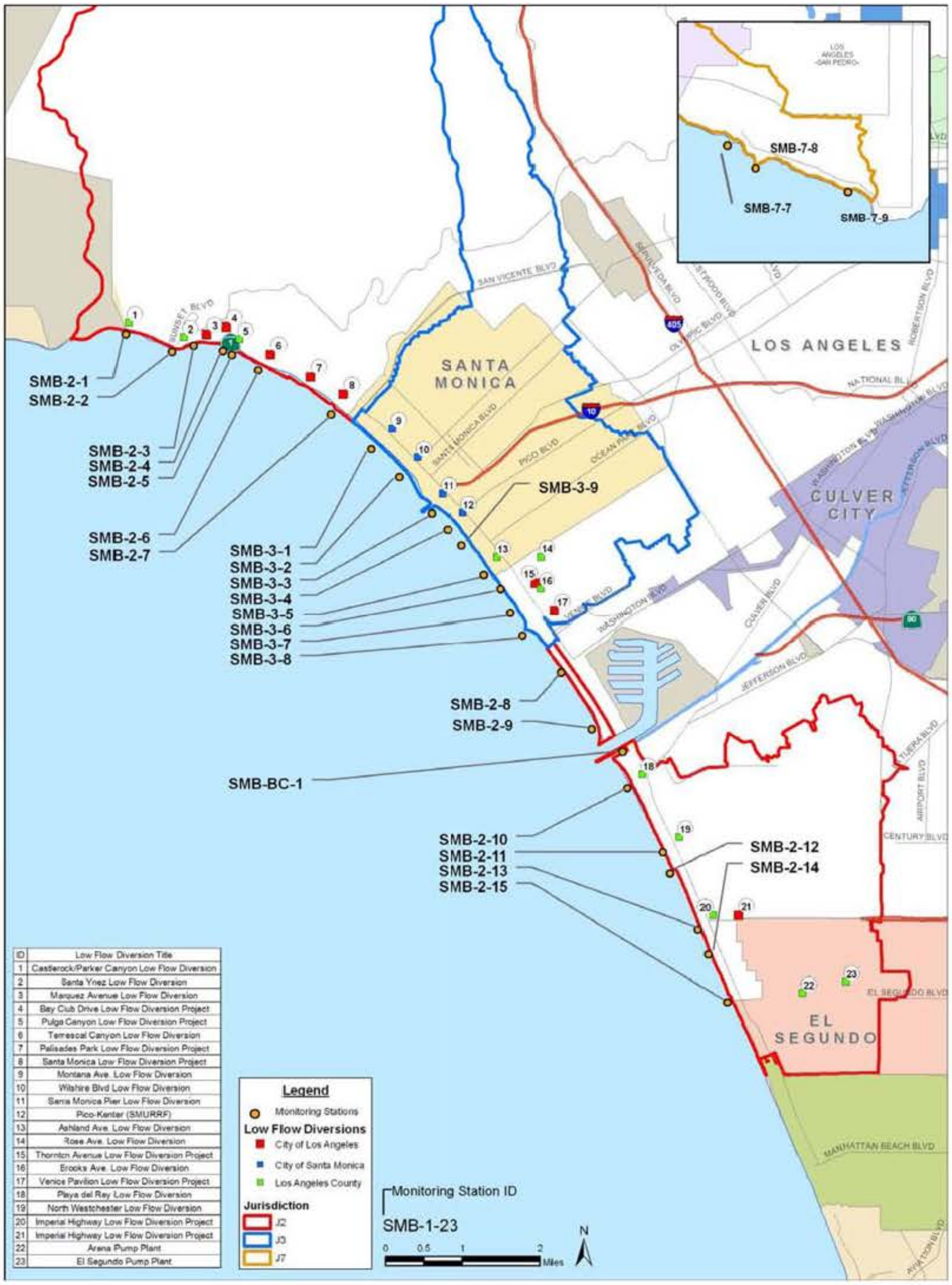
Schedule

Phase I – completed : Phase II – expected completion by Spring 2015

Project Funding

The estimated cost for design and construction of phase II is funded through Proposition "O", the City of Santa Monica's Clean Beach special tax, and the State's Proposition 84.

Attachment A.6. LFDs along the J2 & J3 Shoreline.



RB-AR16586

PART B

City of Los Angeles Area In J7

This Page is Intentionally Left Blank

B. Notice of Intent for EWMP and CIMP for City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7

1. Introduction

The City of Los Angeles has been a participating agency of Jurisdictional Group 7 (J7) of the Santa Monica Bay Watershed since the adoption of the Santa Monica Bay Beaches Bacteria TMDLs in 2003. However, for the purpose of developing the EWMP, the City of Los Angeles and the remaining MS4 permittees of this group have mutually agreed to develop separate programs. Therefore, the City of Los Angeles and the Los Angeles County Flood Control District (LACFCD) respectfully submit this Notification of Intent (NOI) to develop an EWMP for its area within J7 of the Santa Monica Bay watershed per Part VI.C.4.b.i of Order No. R4-2012-0175 (MS4 Permit). Additionally, this NOI includes a statement of the City of Los Angeles' and the LACFCD's intent to follow a Coordinated Integrated Monitoring Program (CIMP) approach. The City of Los Angeles will continue its collaboration with other Peninsula cities should there be opportunities during the development and implementation of EWMP and CIMP to ensure that the MS4 permit requirements are met most effectively.

Though geographically separated, J2 and J3 and J7 are located in the Santa Monica Bay Watershed Management Area and subject to the same water quality regulations. The approach that the City of Los Angeles and the LACFCD will follow for the development of the EWMP and CIMP for the City of Los Angeles' area in J7 will be the same as that outlined in Part A for J2 and J3. Accordingly, we are planning on the EWMP for the City of Los Angeles area in J7 being included as a separate chapter to the EWMP for J2 and J3. It should be emphasized that the other J2 & J3 EWMP Agencies (City of Santa Monica, County of Los Angeles, and City of El Segundo) are not responsible for the development of the EWMP and CIMP of the City of Los Angeles area in J7 or vice versa.

The following sections are intended to provide specific information related to the City of Los Angeles area in J7 of the Santa Monica Bay watershed. The remaining sections are similar to that of J2 & J3.

2. Notification of Intent (Section VI.C.4.b.i and Attachment E Section IV.C.1.)

The City of Los Angeles and LACFCD notify the LARWQCB by this NOI of their intention to collaboratively develop an EWMP for the City of Los Angeles land area of J7 in the Santa Monica Bay Watershed, and will submit a Final Work Plan no later than 18 months after the effective date of the MS4 Permit (June 28, 2014) and a Draft EWMP Plan no later than 30 months after the effective date of the MS4 Permit (June 28, 2015).

Additionally, the City of Los Angeles and LACFCD notify the LARWQCB by this NOI of their intention to collaboratively develop a CIMP for the City of Los Angeles land area of J7 in the Santa Monica Bay Watershed, and will submit a Draft CIMP no later than 18 months after the effective date of the MS4 Permit (June 28, 2014).

3. Interim and final TDML compliance deadlines (Section VI.C.4.b.ii)

Table B.1 lists the TMDLs that have been developed for the Santa Monica Bay watershed. The interim and final compliance deadline of the Santa Monica Bay Nearshore and Offshore TMDL and final compliance deadline of other TMDLs occurring prior to the anticipated approval date of EWMP (April 28, 2016) are included in Table B.2.

The watershed control measures that have been or will be implemented to meet the applicable interim and final trash water quality based effluent limitations (WQBELs) and all other final WQBELs and receiving water limitations are described in more detail in Section 12 of this NOI submittal.

Table B.1. TMDLs applicable to Santa Monica Bay watershed

TMDL	LARWQCB Resolution Number	Effective Date and/or EPA Approval Date
Santa Monica Bay Beaches Dry Weather Bacteria TMDL (Summer and Winter Dry)	2002-004	7/15/2003
Santa Monica Bay Beaches Wet Weather Bacteria TMDL	2002-022	7/15/2003
Santa Monica Bay Nearshore and Offshore Debris TMDL	R10-010	03/20/2012
Santa Monica Bay DDTs and PCBs TMDL	NA	03/26/2012

Table B.2. Interim (debris) and final TMDL compliance deadlines prior to EWMP approval

TMDL	Milestone	Interim/Final	Deadline
Santa Monica Bay Beaches Dry Weather Bacteria TMDL	Compliance with allowable exceedance days during summer dry period	Final	07/15/2006
	Compliance with allowable exceedance days during winter dry period	Final	07/15/2009
Santa Monica Bay Nearshore and Offshore Debris TMDL	20% reduction from baseline load	Interim	03/20/2016

4. Geographical scope (Section VI.C.4.b.iii.(1))

J7 of the Santa Monica Bay watershed is comprised of the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, and Rolling Hills Estate (collectively referred to as Peninsula Cities), and the City of Los Angeles. The City of Los Angeles area is approximately 976.61 acres, or 9.4% of the total area of J7 as shown in Attachment B.1. J7 has unique characteristics that differentiate it from other Santa Monica Bay Jurisdictional Groups. Many of the storm drains on Palos Verdes Peninsula have outfalls on steep bluffs that are up to hundred feet high; some of these outfalls are at rocky points locations without safe access to the shoreline.

The City of Los Angeles land area of J7 includes open space from the White Point Nature Preserve Wild Park featuring 102 acres of restored coastal sage scrub habitat, hiking and handicap accessible trails overlooking the ocean and Catalina Island. Currently, there are three active shoreline stations for bacteria monitoring within the City of Los Angeles area of J7 (SMB 7-6, SMB 7-8, and SMB 7-9), and one inactive station

(SMB 7-7), which is inaccessible and unsafe to enter due to a land slide in 2009 (Attachment B.2).

All drainage infrastructure operated and maintained by the LACFCD within the City of Los Angeles land area in J7 of the Santa Monica Bay Watershed Management Area will be covered under this EWMP.

5. Plan concept (Section VI.C.4.b.iii.(2))

The City of Los Angeles has pursued an integrated water resources approach to address urban runoff to take the most cost effective and efficient use of resources. The City of Los Angeles and LACFCD will evaluate the possibility of regional projects to maximize opportunities for retaining all non-stormwater runoff and stormwater from the 85th percentile, 24-hour storm event as described in the MS4 permit, as well as identifying additional watershed control measures for areas in the watershed that cannot be addressed by a regional project.

6. Cost estimate (Section VI.C.4.b.iii.(2))

The City of Los Angeles and the LACFCD collaboratively prepared a scope of work and cost estimate for developing the EWMP Work Plan, the CIMP and the Final EWMP for the City of Los Angeles' area in J7 of the Santa Monica Bay Watershed. It is estimated that the cost for the Work Plan, the CIMP and the EWMP Plan development for is approximately $50,000. Of that, 20% is allocated for the CIP, and 80% for EWMP. This estimate assumes that the CIMP and EWMP will, in part, be based on the existing TMDL Coordinated Monitoring Plans and Implementation Plans.

7. Memorandum of understanding (Section VI.C.4.b.iii.(3))

Attachment B.3 includes the final draft of the Memorandum of Understanding (MOU) between the City of Los Angeles and the LACFCD. Both agencies have committed to the execution of the MOU as indicated by the signed letters of intent (Attachment B.4). The MOU shall be executed no later than December 28, 2013.

8. Iinterim milestones and deadlines for plan development (section VI.C.4.b.iii.(4))

Table B.4 summarizes the interim milestone and deadlines for Work Plan, CIMP, and EWMP Plan development, which is based on the scope of work for developing the Work Plan, CIMP, and EWMP as agreed to by the City of Los Angeles and the LACFCD. In addition to the monthly agency coordination meetings and coordination meetings with the Technical Advisory Committee, the schedule in Table B.4 assumes one workshop with local watershed stakeholders for each plan. Interim milestones in Table B.4 are the expected due dates of draft Technical Memoranda that will summarize the information and approaches for development of the specified components of the Work Plan, CIMP, and EWMP Plan. It is expected that the draft technical memos will not be finalized; rather, the information presented in the memos will be revised based on comments and presented in the Work Plan, CIMP, and EWMP Plan.

Table B.4. Proposed interim milestones and deadlines for plan development

Deliverable	Milestones and Deadlines
Work Plan	
Draft Technical memos • Identification of water quality priorities • Existing and future watershed control measures, identification of potential regional projects • Reasonable assurance analysis approach • BMP selection approaches	March 2014
Draft Work Plan	April 2014
Final Work Plan submitted to the LARWQCB	June 2014
Coordinated Integrated Monitoring Program	
Draft Technical memos • Outfall and receiving water monitoring approach • Monitoring sites selection • New development and redevelopment effectiveness tracking	March 2014
Draft CIMP	April 2014
Final Draft CIMP submitted to the LARWQCB	June 2014
Enhanced Watershed Management Program	
Draft Technical memos • Approach to US EPA TMDLs, 303(d) listings, other exceedances of RWLs • Final selection of regional projects • Feasibility analyses of regional projects, customization of MCMs, identification of other BMPs • Project schedules and cost estimates	April 2015
Draft EWMP	May 2015
Final Draft EWMP submitted to the LARWQCB	June 2015

9. Structural BMP (Section VI.C.4.b.iii.(5))

The City of Los Angeles is committed to retrofit 50 catch basins within the City owned portion of J7 before June of 2015. This will provide for over 20% trash reduction in compliance with the Santa Monica Bay Nearshore and Offshore Debris TMDL.

10. LID ordinance (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1))

Table B.5 summarizes the status of Low Impact Development (LID) ordinances by the City of Los Angeles and LACFCD. As presented in Table B.5, greater than 50% of the land area addressed by the geographical scope of the EMWP is addressed by an LID ordinance that is in place.

Table B.5. Summary of percent EWMP area addressed by LID ordinances

EWMP agency	Status LID ordinance	% EWMP area addressed by LID ordinance
City of Los Angeles	In place	100%
LACFCD	N/A	N/A
	Total EWMP Area covered by LID Ordinance	100%

RB-AR16592

In Place – Permittee has adopted an LID Ordinance that is in compliance with the requirements of the MS4 Permit for its portion in the watershed. For the City of Los Angeles: its LID Ordinance became operative on May 12, 2012. The City of Los Angeles is currently amending sections of the LID Ordinance, as well as its Stormwater and Urban Runoff Pollution Control Ordinance (L.A.M.C. Chapter VI, Article 4.4) to meet all the MS4 permit requirements.

11. Green street polices (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2))

Table B.6 summarizes the status of green street policies by the City of Los Angeles and the LACFCD. As presented in Table B.6, greater than 50% of the land area addressed by the geographical scope of the EMWP is addressed by green streets policies that are in place.

Table B. 6. Summary of percent EWMP area addressed by Green Street Policies

EWMP agency	Status of Green Street Policy	% EWMP area addressed by Green Street Policy
City of Los Angeles	In place	100%
LACFCD	N/A	N/A
Total EWMP Area covered by LID Ordinance		100%

In Place – Permittee has adopted a Green Street Policy that is in compliance with the requirements of the MS4 Permit for its portion in the watershed.

12. Implementation of watershed control measures during plan development (Sections VI.C.4.b.ii)

The City of Los Angeles has implemented an extensive program of institutional measures (street sweeping, catch basin cleaning, public education, etc.) for pollution source control that supports reduction of bacteria discharges from the City of Los Angeles land area in J7 of the Santa Monica Bay watershed. In addition, the City will retrofit 50 catch basins with screens and/or inserts within its area to satisfy the 20% compliance milestone of the Santa Monica Bay Nearshore and Offshore Debris TMDL by March 2016.

Attachment B.1. **The City of Los Angeles land area within J7 of the Santa Monica Bay Watershed.**

Attachment B.2. The City of Los Angeles detailed land area within J7 of the Santa Monica Bay Watershed.

RB-AR16595

Attachment B.3. Final Draft Memorandum of Understanding.

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE CITY OF LOS ANGELES AND THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

REGARDING THE ADMINISTRATION AND COST SHARING FOR DEVELOPMENT OF THE ENHANCED WATERSHED MANAGEMENT PROGRAM FOR THE CITY OF LOS ANGELES AREA OF JURISDICTION GROUP 7 OF THE SANTA MONICA BAY WATERSHED

This Memorandum of Understanding (MOU) is made and entered into as of the date of the last signature set forth below by and between the City of Los Angeles, a municipal corporation, and the Los Angeles County Flood Control District (LACFCD), a political subdivision of the State of California. Collectively, these entities shall be known herein as "PARTIES" or individually as "PARTY."

WITNESSETH

WHEREAS, the Regional Water Quality Control Board, Los Angeles Region (Regional Board) adopted National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Order No. R4-2012-0175 (MS4 Permit); and

WHEREAS, the MS4 Permit became effective on December 28, 2012 and requires that the LACFCD, County of Los Angeles, and 84 of the 88 cities (excluding Avalon, Long Beach, Palmdale, and Lancaster) within the County of Los Angeles comply with the prescribed elements of the MS4 Permit; and

WHEREAS, the MS4 Permit identified the Parties as the MS4 permittees that are responsible for compliance with the MS4 Permit requirements pertaining to Jurisdiction Groups 7 in the Santa Monica Bay Watershed Management Area; and

WHEREAS, the Parties have agreed to collaborate on the development of an Enhanced Watershed Management Program (EWMP) for the City of Los Angeles area within Jurisdictional Group 7 of the Santa Monica Bay Watershed Management Area (CLA in J7) to comply with certain elements of the MS4 Permit; and

WHEREAS, for the purpose of developing the Enhanced Watershed Management Programs, the City of Los Angeles and the other MS4 permittees of the Jurisdictional Group 7 of the Santa Monica Bay Watershed,(Except for the Los Angeles County Flood Control District), have mutually agreed to develop separate programs

WHEREAS, the PARTIES agree that each shall assume full and independent responsibility for ensuring its own compliance with the MS4 Permit despite the collaborative approach of this MOU; and

WHEREAS, the development of an EWMP includes the preparation of a Work Plan, a draft and final Coordinated Integrated Monitoring Plan ("CIMP"), and a draft and final Enhanced Watershed Management Program Plan ("EWMP Plan"), collectively referred to herein as "Plans"; and

WHEREAS, the Parties collaboratively prepared a final Scope of Work and Request for Proposal to obtain a Consultant for preparing the Plans that will satisfy the requirements of the MS4 Permit; and

WHEREAS, the PARTIES have determined that hiring a Consultant to prepare and deliver the PLANS will be beneficial to the PARTIES and they desire to participate and will provide funding in accordance with the cost allocation formula shown in Table (3) of Exhibit A; and

WHEREAS, the Parties have agreed that the total cost for developing the Plans shall not exceed $52,500 including the project administration and management cost; and

WHEREAS, the Parties have agreed to retain the City of Los Angeles to coordinate the services of a Consultant to develop the Plans, the Parties have agreed to share in the cost and pay the City of Los Angeles for these consultant services as provided by Exhibit A of this MOU, and the City of Los Angeles has agreed to act on behalf of all Parties in the preparation of the Plans and the coordination of the consultant services;

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the Parties, and of the promises contained in this MOU, the PARTIES agree as follows:

Section 1. Recitals: The recitals set forth above are incorporated into this MOU.

Section 2. Purpose: The purpose of this MOU is to cooperatively fund the preparation and submittal of the Plans to the Regional Board.

Section 3. Cooperation: The Parties shall fully cooperate with one another to attain the purpose of this MOU.

Section 4. Voluntary: This MOU is voluntarily entered into for the purpose of preparing and submitting the Plans to the Regional Board.

Section 5. Term: Term: This MOU shall become effective on the last date of execution by the Parties or December 28, 2013, whichever comes first, and shall remain and continue to remain in effect until June 30, 2016. If a Party does not execute this MOU by

December 28, 2013, that Party shall be excluded from this MOU and this MOU shall become effective on December 28, 2013 by execution by the remaining Parties.

Section 6. Assessment for Proportional Cost: The LACFCD agree to pay the City of Los Angeles for preparation and delivery of the Plans in the amounts shown in Table (4) of Exhibit A, based on the total costs shown in Tables (1) and (2) and the cost allocation formula shown in Table (3) of Exhibit A, attached hereto and made part of this MOU by this reference. The City of Los Angeles will invoice the LACFCD in two installments upon execution of this MOU as shown in Table (4) of Exhibit A, based on the allocated costs for developing the Plan and the project administration and management costs at a percentage not to exceed 5% of the allocated costs for development of the Plan. At the end of each fiscal year, the City of Los Angeles will provide the LACFCD with a statement with the actual expenditures. Unexpended funds at the termination of this MOU will be reimbursed to the LACFCD in accordance with the cost allocation formula set forth in Table (3) of Exhibit A

Section 7. City of Los Angeles agrees:

a. To solicit proposals for, award and administer a Consultant contract for the preparation and delivery of the Plans. The City of Los Angeles will be compensated for the administration and management of the Consultant contract as described in Exhibit A.

b. To utilize the funds deposited by the Parties only for the administration of the Consultant contract, project management, and the preparation and completion of the Plans.

c. To provide the Parties with an electronic copy of the technical memos, draft Plans and completed Plans within 7 business days of receipt from the Consultant.

d. To invoice the Parties in the amounts and according to the schedule shown in Table (4) of Exhibit A.

e. To provide an accounting within 90 days at the termination of this MOU or within 90 days after the early termination of the MOU pursuant to Section 11. The City of Los Angeles shall return the unused portion of all funds deposited with the City of Los Angeles in accordance with the cost allocation formula set forth in table (3) of Exhibit A.

Section 8. The Parties further agree:

a. To make a full faith effort to cooperate with one another to achieve the purposes of this MOU by providing information about project opportunities, reviewing deliverables in a timely manner, and informing administration, and/or governing body.

b. To fund the cost of the preparation and delivery of the Plans and to pay the City of Los Angeles for the preparation and delivery of the Plans based on the cost allocation shown in Table (3) of Exhibit A. This includes the costs incurred by the City of Los Angeles for administering the Consultant services between awarding the Consultant contract and the execution of this MOU

c. To grant access rights and entry to the City of Los Angeles and the Consultant during the terms of this MOU to the Parties' facilities (i.e. storm drains, channels, catch basins, properties, etc.) ("Facilities") to achieve the purposes of this MOU. Prior to exercising said right of entry, the City of Los Angeles or their Consultant shall provide written notice to the Parties at least 72 hours in advance. For the purposes of this provision, written notice shall include notice delivered via e-mail that has been delivered to the Parties' representatives identified in Exhibit B.

Section 9. Invoice and Payment

a. Payment: The Parties shall pay the City of Los Angeles their proportional share of the cost for the preparation and delivery of the Plans and project administration and management as shown in Table (4) of Exhibit A. Payments are due within sixty (60) days of receiving the invoice from the City of Los Angeles.

b. Invoice: The City of Los Angeles will invoice Parties in two installments in the amounts shown in Table (4) of Exhibit A. The first invoice will be sent upon execution of this MOU or in January 2014, whichever comes first. The second invoice will be sent in July 2014.

c. Contingency: The City of Los Angeles will notify the Parties if actual expenditures are anticipated to exceed the cost estimates contained in Exhibits A and obtain approval of such expenditures from all Parties. Upon approval, the Parties agree to reimburse the City of Los Angeles for their proportional share of these additional expenditures at an amount not to exceed 10% of the original cost estimate as shown in Exhibit A. This 10% contingency will not be invoiced, unless actual expenditures exceed the original cost estimate. Expenditures that exceed the 10% contingency will require an amendment of this MOU.

Section 10. Indemnification

Each Party shall indemnify, defend, and hold harmless each other Party, including its special districts, elected and appointed officers, employees, and agents, from and against any and all liability, including but not limited to demands, claims, actions, fees, costs, and expenses (including attorney and expert witness fees), arising from or connected with the respective acts of each Party arising from or related to this MOU; provided, however, that no party shall indemnify another party for that party's own negligence or willful misconduct.

In light of the provisions of Section 895.2 of the Government Code of the State of California imposing certain tort liability jointly upon public entities solely by reason of such entities being parties to an agreement (as defined in Section 895 of said Code), each of the Parties hereto, pursuant to the authorization contained in Section 895.4 and 895.6 of said Code, shall assume the full liability imposed upon it or any of its officers, agents, or employees, by law for injury caused by any act or omission occurring in the performance of this MOU to the same extent that such liability would be imposed in the absence of Section 895.2 of said Code. To achieve the above stated purpose, each Party indemnifies, defends, and holds harmless each other Party for any liability, cost, or expense that may be imposed upon such other Party solely by virtue of said Section 895.2. The provisions of Section 2778 of the California Civil Code are made a part hereof as if incorporated herein.

Section 11. Termination

a. This MOU may be terminated upon the express written agreement of all Parties. If this MOU is terminated, all Parties must agree on the equitable redistribution of remaining funds deposited, if there are any, or payment of invoices due at the time of termination. Completed work shall be owned by all Parties. Rights to uncompleted work by the Consultant still under contract will be held by the Party or Parties who fund the completion of such work.

b. If a Party fails to comply with any of the terms or conditions of this MOU, that Party shall forfeit its rights to the work completed through this MOU, but no such forfeiture shall occur unless and until the defaulting PARTY has first been given notice of its default and a reasonable opportunity to cure the alleged default.

Section 12. General Provisions

a) Notices. Any notices, bills, invoices, or reports relating to this MOU, and any request, demand, statement or other communication required or permitted hereunder shall be in writing and shall be delivered to the Representative of the Party at the address set forth in Exhibit B. Parties shall promptly notify each other of any change of contact information, including personnel changes, provided in Exhibit B. Written notice shall include notice delivered via email or fax. A notice shall be deemed to have been received on (a) the date of delivery, if delivered by hand during regular business hours, or by confirmed facsimile or by email; or (b) on the third (3) business day following mailing by registered or certified mail (return receipt requested) to the addresses set forth in Exhibit B.

b) Administration. For the purpose of this MOU, the parties hereby designate as their respective Party Representatives the persons named in Exhibit B. The designated Party Representatives, or their respective designees, shall administer the terms and conditions of this MOU on behalf of their respective Party. Each of the persons signing below on behalf of a Party represents and warrants that they are authorized to sign this MOU on behalf of such Party.

c) Relationship of Parties. The Parties are and shall remain at all times as to each other, wholly independent entities. No Party to this MOU shall have power to incur any debt, obligation, or liability on behalf of another Party unless expressly provided to the contrary by this MOU. No employee, agent, or officer of a Party shall be deemed for any purpose whatsoever to be an agent, employee or officer of another Party.

d) Binding Effect. This MOU shall be binding upon and inure to the benefit of each Party to this MOU and their respective heirs, administrators, representatives, successors and assigns.

e) Amendment. The terms and provisions of this MOU may not be amended, modified, or waived, except by an instrument in writing signed by all the Parties. This section applies to, but is not limited to, amendments proposed to address regulatory changes in the MS4 permit, modifications to the Scope of Work, or changes in the number of Parties to this MOU. For the City of Los Angeles, the Director of Bureau of Sanitation or his/her designee is authorized to execute such amendments.

f) Waiver. Waiver by any Party to this MOU of any term, condition, or covenant of this MOU shall not constitute a waiver of any other term, condition, or covenant. Waiver by any Party to any breach of the provisions of this MOU shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this MOU.

g) Law to Govern; Venue. This MOU shall be interpreted, construed and governed according to the laws of the State of California. In the event of litigation between the Parties, venue in the state trial courts shall lie exclusively in the County of Los Angeles.

h) No Presumption in Drafting. The Parties to this MOU agree that the general rule that an MOU is to be interpreted against the Party drafting it, or causing it to be prepared shall not apply.

i) Entire Agreement. This MOU constitutes the entire agreement of the Parties with respect to the subject matter hereof and supersedes all prior or contemporaneous agreements, whether written or oral, with respect thereto.

j) Severability. If any term, provision, condition or covenant of this MOU is declared or determined by any court or competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this MOU shall not be affected thereby and this MOU shall be read and constructed without the invalid, void, or unenforceable provision(s).

k) Counterparts. This MOU may be executed in any number of counterparts, each of which shall be an original, but all of which taken together shall constitute but one and the same instrument, provided, however, that such counterparts shall have been delivered to all Parties to this MOU.

l) All Parties have been represented by counsel in the preparation and negotiation of this MOU. Accordingly, this MOU shall be construed according to its fair language.

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed by their duly authorized representatives and affixed as of the date of signature of the Parties:

CITY OF LOS ANGELES

Date: ______________________

By: ___________________
Capri W. Maddox, President
Board of Public Works

ATTEST:

By: _______________________
June Lagmay
City Clerk

APPROVED AS TO FORM:

Carmen Trutanich
City Attorney

By: ____________________
John A. Carvalho
Deputy City Attorney

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By ________________________
Chief Engineer

APPROVED AS TO FORM:

John F. Krattli
County Counsel

By ______________________________________ ________________________
Deputy Date

EXHIBIT A

Santa Monica Bay Watershed
Jurisdictional Groups 2&3
EWMP
Funding Contributions

Table 1. Consultant Contract Costs

Deliverable	Deliverable Due Date	Cost
Work Plan	June 28, 2014	$ 9000
CIMP	June 28, 2014	$ 7,500
EWMP Plan	June 28, 2015 (draft plan) April 28, 2016 (final plan)	$ 22,000
Project Management Coordination & Meetings	On going	$11,500
Contract Cost	-	**$ 50,000**

Table 2. Total Cost

Item	Cost
Consultant Contract	$50,000
Project Administration & Management (5%)*	$2,500
Total Cost	**$52,500**
Flood Control District Contribution (10%)	-$5,250
Cost for area cost sharing	**$47,250**

Table 3. Cost Allocation Formula for Area Cost Sharing

Party	Acres	Percent of Area(1)	Total Cost
City of Los Angeles		**100%**	$47,250
Total		**100%**	**$47,250**

Table 4.City of Los Angeles Invoicing Schedule and Invoice Amounts to Parties

Invoice Date[1]	LACFCD Invoice
January 2014	$2,625
July 2014	$2,625
Total Invoice Amount[1]	**$5,250**
10% Contingency	$525
Total including 10% contingency	**$5,775**

[1]Contingency is 10% of the total estimated cost. Contingency will not be invoiced unless there is a need for its expenditure as agreed by all Parties.

EXHIBIT B

Santa Monica Bay Watershed
Jurisdictional Groups 2&3
Responsible Agencies Representatives

1. City of Los Angeles
   Department of Public Works
   Bureau of Sanitation, Watershed Protection Division
   1149 S. Broadway
   Los Angeles, CA 90015

   Shahram Kharaghani
   E-mail: Shahram.Kharaghani@Lacity.org
   Phone: (213) 485-0587
   Fax: (213) 485-3939

2. Los Angeles County Flood Control District
   Department of Public Works
   Watershed Management Division, 11th Floor
   900 South Fremont Avenue
   Alhambra, CA 91803-1331

   Gary Hildebrand
   E-mail: GHILDEB@dpw.lacounty.gov
   Phone: (626) 458-4300
   Fax: (626) 457-1526

Attachment B.4. Letter of Intent.

CITY OF LOS ANGELES
CALIFORNIA

ANTONIO R. VILLARAIGOSA
MAYOR

BUREAU OF SANITATION
ENRIQUE C. ZALDIVAR
DIRECTOR
TRACI J. MINAMIDE
CHIEF OPERATING OFFICER
VAROUJ S. ABKIAN
ADEL H. HAGEKHALIL
ALEXANDER E. HELOU
ASSISTANT DIRECTORS
NEIL M. GUGLIELMO
ACTING CHIEF FINANCIAL OFFICER
WATERSHED PROTECTION DIVISION
1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939

June 20, 2013

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, California 90013

Attention: Renee Purdy

Dear Mr. Unger:

CITY OF LOS ANGELES COMMITMENT TO PARTICIPATE IN AND SHARE THE COST FOR DEVELOPMENT OF ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM FOR THE CITY AREA IN JURISDICTIONAL GROUP 7 OF THE SANTA MONICA BAY WATERSHED

The City of Los Angeles submits this letter of intent with our commitment to participate in and share the cost for the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) for the City area in Jurisdiction 7 of the Santa Monica Bay Watershed and all drainage infrastructure owned and maintained by the Los Angeles County Flood Control District (LACFCD) within this area, as outlined in the Notice of Intent submitted by the City of Los Angeles to meet the requirements of Part VI.C.4.b of the MS4 Permit (Order No. R4-2012-0175) and the CIMP notification requirements specified in Attachment E Section IV.C.1.

The City of Los Angeles (lead agency for EWMP and CIMP development) and LACFCD are the MS4 permittees for this EWMP and CIMP. The final draft agreement to fund program development by the City of Los Angeles and LACFCD for this watershed has been included in the Notice of Intent and the City of Los Angeles is committed to execute this agreement prior to December 28, 2013.

Should you have any questions regarding this correspondence, please contact me at Shahram.Kharaghani@lacity.org or phone (213) 485-0587 or your staff may contact Huub Cox at Hubertus.Cox@lacity.org or phone (213) 485-3984 or Hamid Tadayon at Hamid.Tadayon@lacity.org or (213) 485-3841.

Sincerely,

SHAHRAM KHARAGHANI, Ph.D., P.E., BCEE
Program Manager

SK:HC:HT
WPDCR9043

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

Sam Unger, Executive Officer
City of Los Angeles Letter of Intent for J7 Santa Monica Bay Watershed
June 20, 2013
Page 2

cc: Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region
Enrique Zaldivar, City of Los Angeles, Bureau of Sanitation
Adel Hagekhalil, City of Los Angeles, Bureau of Sanitation
Gary Hildebrand, County of Los Angeles

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, Director

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

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

June 24, 2013

IN REPLY PLEASE
REFER TO FILE: WM-7

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

Attention Ms. Renee Purdy

Dear Mr. Unger:

LETTER OF INTENT – LOS ANGELES COUNTY FLOOD CONTROL DISTRICT SANTA MONICA BAY WATERSHED JURISDICTIONAL GROUP 7 WITHIN THE CITY OF LOS ANGELES ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM

The Los Angeles County Flood Control District (LACFCD) submits this Letter of Intent to participate in and share the cost of the development of an Enhanced Watershed Management Program (EWMP) and a Coordinated Integrated Monitoring Program (CIMP) for the Santa Monica Bay Watershed Jurisdictional Group 7 within the City of Los Angeles. This Letter of Intent serves to satisfy the EWMP notification requirements of Section VI.C.4.b.iii(3) of Order No. R4-2012-0175 (Municipal Separate Storm Sewer System Permit) and the CIMP requirements of Section IV.C.1 of Attachment E of the Municipal Separate Storm Sewer System Permit.

The Santa Monica Bay Watershed Jurisdictional Group 7 within the City of Los Angeles consists of the following agencies: City of Los Angeles as the coordinating agency for EWMP and CIMP development and LACFCD. The Santa Monica Bay Watershed Jurisdictional Group 7 within the City of Los Angeles has included a final draft Memorandum of Understanding as Attachment B.3. The LACFCD intends to submit a final Memorandum of Understanding to the County of Los Angeles Board of Supervisors (which is the LACFCD's governing body) for approval prior to December 28, 2013.

Mr. Samuel Unger
June 24, 2013
Page 2

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

Very truly yours,

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

RP:jht
P:\wmpub\Secretarial\2013 Documents\Letter\LOI SMB J7 LACFCD.doc\C13234

cc: City of Los Angeles

November 26, 2013

Dr. Shahram Kharaghani
City of Los Angeles
Department of Public Works, Bureau of Sanitation
Watershed Protection Division
1149 South Broadway, 10th Floor
Los Angeles, CA 90015

Ms. Stephanie Katsouleas, Director
City of El Segundo
Department of Public Works
350 Main Street
El Segundo, CA 90245

Mr. Rod Gould, City Manger
City of Santa Monica
1685 Main Street
Santa Monica, CA 90407

Ms. Gail Farber, Director
County of Los Angeles
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

Ms. Gail Farber, Chief Engineer
Los Angeles County Flood Control District
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

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

Dear Permittees participating in the Santa Monica Bay Subwatershed J2, J3 and part of J7:

On November 8, 2012, the California Regional Water Quality Control Board, Los Angeles Region (Regional Board) adopted Order No. R4-2012-0175, *Waste Discharge Requirements for MS4 Discharges within the Coastal Watersheds of Los Angeles County, except those Discharges Originating from the City of Long Beach* (hereafter, Order). The Order allows Permittees the option to develop Watershed Management Programs (WMP) to implement the requirements of this Order on a watershed scale through customized strategies, control measures, and best management practices (BMPs). Participation in a Watershed Management Program is voluntary and allows a Permittee to address the highest watershed priorities, including complying with the requirements of Part V.A (Receiving Water Limitations), Part VI.E

(Total Maximum Daily Load Provisions) and Attachments L through R, by customizing the control measures in Parts III.A (Prohibitions – Non-Storm Water Discharges) and VI.D (Minimum Control Measures) of the Order.

The Order also allows Permittees the option to elect to develop an enhanced Watershed Management Program (EWMP). An EWMP is a watershed based program that comprehensively evaluates opportunities, within the participating Permittees' collective jurisdictional area in a watershed management area, for collaboration among Permittees and other partners on multi-benefit regional stormwater retention projects. These projects will, wherever feasible, retain (i) all non-storm water runoff and (ii) all storm water runoff from the 85th percentile, 24-hour storm event for the drainage areas tributary to the projects, while also achieving other benefits including flood control and water supply, among others.

Pursuant to Part VI.C.4.b of the Order, Permittees electing to develop a WMP or EWMP were required to submit notification and supporting documentation to the Regional Board of their intent to develop a WMP or EWMP, and request a submittal date for their draft program plan, by June 28, 2013.

On June 27, 2013, the Regional Board received the Santa Monica Bay (SMB) Subwatershed Jurisdictional Groups 2 and 3 (J2 and J3) and the City of Los Angeles area within Jurisdictional Group 7 (J7) notification of intent (NOI) to develop an EWMP. The Permittees participating in the SMB Subwatershed J2 and J3 EWMP are the City of Los Angeles, City of El Segundo, City of Santa Monica, County of Los Angeles and the Los Angeles County Flood Control District. The Permittees participating in the City of Los Angeles area within Jurisdictional Group 7 are the City of Los Angeles and the Los Angeles County Flood Control District.

Regional Board Staff has reviewed Part A of the EWMP NOI covering the SMB Subwatersheds J2 and J3 for compliance with all notification requirements of Part VI.C of the Order. Staff has determined that the following additional information and documentation is required per Part VI.C. of the Order:

- The City of El Segundo did not identify any watershed control measures to be implemented during EWMP development to achieve compliance with the interim WQBELs for the SMB Debris TMDL or the final dry weather WQBELs and RWL for the SMB Beaches Bacteria TMDL.
- The map in Attachment A.1 needs to be updated because the Chevron El Segundo Refinery does not extend out to the coastline. West of the Chevron El Segundo Refinery is the El Segundo Generation Station and open beach, these areas need to be included in the geographical scope of the SMB Subwatershed J2 and J3 EWMP.
- The Cities of Los Angeles and Santa Monica need to quantify the water quality improvements to be achieved by implementing Phase II of the Penmar Water Quality Improvement Project (e.g., estimate the pollutant load reductions to be achieved by the proposed treatment system.)

Permittees participating in the SMB Subwatershed J2 and J3 EWMP are required to provide the information listed above as soon as possible and no later than **December 17, 2013**. An amended NOI and the other required supporting documentation must be submitted to losangeles@waterboards.ca.gov with the subject line "LA County MS4 Permit – Revised Notification of Intent" with copies to Ivar.Ridgeway@waterboards.ca.gov and Rebecca.Christmann@waterboards.ca.gov.

Pursuant to section VI.C.4.b.iii.(5) of the Order, the proposed suite of structural BMPs are subject to approval by the Regional Water Board Executive Officer. Review and approval of the proposed structural BMPs will be provided under separate cover, once the requested information regarding the proposed structural BMPs has been provided to the Regional Board.

Regional Board Staff has reviewed Part B of the EWMP NOI covering the City of Los Angeles area within SMB Subwatershed J7 for compliance with all notification requirements of Part VI.C of the Order. The City of Los Angeles area within J7 is approximately 977 acres or 9.4% of the total area of SMB Jurisdictional Group 7. This means that less than 10% of the subwatershed is included in the geographical scope of the City of Los Angeles area within the proposed J7 EWMP. Further, this area is not contiguous with the areas within Subwatersheds J2 and J3. The City of Los Angeles area within J7 does not meet the intent of an Enhanced Watershed Management Program. Regional Board staff has had multiple conversations with Dr. Shahram Kharaghani and other City of Los Angeles staff regarding the following options available to the City:

- Elect to develop an Individual Watershed Management Program. In which case the draft individual WMP is required to be submitted by June 28, 2014; or
- Elect to participate with another EWMP, which is geographically contiguous with the City of Los Angeles area within Subwatershed J7; or
- Comply with the baseline requirements in Part VI.D of the Order and demonstrate compliance with receiving water limitations pursuant to Part V.A and with applicable interim and final water quality-based effluent limitations (WQBELs) in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3) and VI.E.2.e.i.(1)-(3), respectively.

On November 19, 2013, Dr. Shahram Kharaghani confirmed that the City of Los Angeles will develop a stand-alone WMP by June 28, 2014 for the City area within subwatershed J7.

Once all additional information and documentation have been provided and the Regional Board has determined that all of the notification requirements of Part VI.C of the Order have been met, Permittees participating in the SMB Subwatersheds J2 and J3 EWMP or the City of Los Angeles area within Subwatershed J7 WMP should continue working on the completion of their draft EWMP or WMP, respectively. Until the SMB Subwatershed J2 and J3 EWMP or the City of Los Angeles area within Subwatershed J7 Program is approved by the Regional Board, Permittees participating in the EWMP or WMP are required to:

(a) Continue to implement all watershed control measures in their existing storm water management programs, including actions within each of the six categories of minimum control measures consistent with Title 40, Code of Federal Regulations, section 122.26(d)(2)(iv);
(b) Continue to implement watershed control measures to eliminate non-storm water discharges through the MS4 that are a source of pollutants to receiving waters consistent with Clean Water Act section 402(p)(3)(B)(ii);
(c) Target implementation of watershed control measures in (a) and (b) above to address known contributions of pollutants from MS4 discharges to receiving waters;
(d) Implement watershed control measures, including those from existing TMDL implementation plans, to ensure that MS4 discharges achieve compliance with interim and final trash WQBELs and all other final WQBELs and receiving water limitations

pursuant to Part VI.E and set forth in Attachments L through Q of the Order by the applicable compliance deadlines occurring prior to approval of a EWMP or WMP; and

(e) Meet all interim and final deadlines for development of a EWMP or WMP.

If you have any questions, please contact Mr. Ivar Ridgeway, Storm Water Permitting, at Ivar.Ridgeway@waterboards.ca.gov or by phone at (213) 620-2150 or Ms. Rebecca Christmann at Rebecca.Christmann@waterboards.ca.gov or by phone at (213) 576-6786.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

cc: Huub Cox, City of Los Angeles
Hamid Tadayon, City of Los Angeles
Lifan Xu, City of El Segundo
Rick Valte, City of Santa Monica
Angela George, County of Los Angeles, Department of Public Works
Gary Hildebrand, Los Angeles County Flood Control District
David Smith, NPDES Program, USEPA Region IX
Jennifer Fordyce, Office of Chief Counsel, State Water Board

ECM #1085877

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

BUREAU OF SANITATION

ENRIQUE C. ZALDIVAR
DIRECTOR

TRACI J. MINAMIDE
CHIEF OPERATING OFFICER

VAROUJ S. ABKIAN
ADEL H. HAGEKHALIL
ALEXANDER E. HELOU
ASSISTANT DIRECTORS

NEIL M. GUGLIELMO
CHIEF FINANCIAL OFFICER

1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939
WWW.LACITYSAN.ORG

December 16, 2013

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, California 90013

Attention: Renee Purdy

Dear Mr. Unger:

SUBMITTAL OF REVISED NOTICE OF INTENT FOR DEVELOPMENT OF WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM FOR THE CITY OF LOS ANGELES LAND AREA WITHIN THE JURISDICTIONAL GROUP SEVEN OF THE SANTA MONICA BAY WATERSHED

This is in response to your letter dated November 26, 2013 regarding your review of the Notice of Intent (NOI) for the Enhanced Watershed Management Program for the City of Los Angeles land area within the Jurisdictional Group 7 of the Santa Monica Bay Watershed. According to your request, the City of Los Angeles is providing the attached revised NOI with the modified approach to develop a Watershed Management Program (WMP) instead of an Enhanced Watershed Management Program for this area.

We hope that the revised NOI satisfies the requirements of RWQCB's review and we look forward to continuing the process of WMP development for the City's land area within the Jurisdictional Group 7 of the Santa Monica Bay Watershed.

Should you have any questions about this submittal, please contact me at Shahram.Kharaghani@lacity.org or phone (213) 485-0587 or your staff may contact Huub Cox at hubertus.Cox@lacity.org or phone (213) 485-3984 or Hamid Tadayon at Hamid.Tadayon@lacity.org or phone (213) 485-3841.

Sincerely

SHAHRAM KHARAGHANI, Ph.D., PE, BCEE
Program Manager

SK:HC:ht
WPDCR9090

Attachment

cc: Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region
Enrique Zaldivar, City of Los Angeles, Bureau of Sanitation
Adel Hagekhalil, City of Los Angeles, Bureau of Sanitation
Gary Hildebrand, County of Los Angeles, Department of Public Works
Rick Valte, City of Santa Monica
Stephanie Katsouleas, City of El Segundo

NOTICE OF INTENT

Watershed
Management Program
and
Coordinated Integrated
Monitoring Program

Santa Monica Bay
Watershed
Los Angeles
Area in J7

City of Los Angeles
Los Angeles County Flood Control District

December 17, 2013

This Page is Intentionally Left Blank

TABLE OF CONTENTS

Notice of Intent for EWMP and CIMP for City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7 1

1. Introduction 1
2. Notification of Intent (Section VI.C.4.b.i and Attachment E Section IV.C.1.) 1
3. Interim and final TMDL compliance deadlines (Section VI.C.4.b.ii) 1
4. Geographical scope (Section VI.C.4.b.iii.(1)) 2
5. Cost estimate (Section VI.C.4.b.iii.(2)) 2
6. Memorandum of Understanding (Section VI.C.4.b.iii.(3)) 3
7. Interim milestones and deadlines for plan development (section VI.C.4.b.iii.(4)) 3
8. LID ordinance (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1)) 3
9. Green street polices (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2)) 4
10. Implementation of watershed control measures during plan development (Sections VI.C.4.b.ii) 4

TABLE OF CONTENTS

Attachment 1. The City of Los Angeles land area within J7 of the Santa Monica Bay Watershed.. 5

Attachment 2. The City of Los Angeles detailed land area within J7 of the Santa Monica Bay Watershed........ 6

Notice of Intent for WMP and CIMP for City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7

1. Introduction

The City of Los Angeles has been a participating agency of Jurisdictional Group 7 (J7) of the Santa Monica Bay Watershed since the adoption of the Santa Monica Bay Beaches Bacteria TMDLs in 2003. However, the City of Los Angeles and the other MS4 permittees in J7 could not reach an agreement for a collaborative approach to satisfying the requirements of the MS4 permit. Following the request by the RWQCB on November 26, 2013 to pursue a Watershed Management Program (WMP) instead of an Enhanced Watershed Management Program (EWMP), the City of Los Angeles and the Los Angeles County Flood Control District (LACFCD) respectfully submit this revised Notification of Intent (NOI) to develop a WMP for the City of Los Angeles land area within J7 of the Santa Monica Bay watershed per Part VI.C.4.b.i of Order No. R4-2012-0175 (MS4 Permit). Additionally, this NOI includes a statement of the City of Los Angeles' and the LACFCD's intent to follow a Coordinated Integrated Monitoring Program (CIMP) approach. The City of Los Angeles will continue its collaboration with other Peninsula cities should there be opportunities during the development and implementation of the WMP and CIMP to ensure that the MS4 permit requirements are met most effectively.

The following sections are intended to provide specific information related to the City of Los Angeles area in J7 of the Santa Monica Bay watershed.

2. Notification of Intent (Section VI.C.4.b.i and Attachment E Section IV.C.1.)

The City of Los Angeles and LACFCD notify the LARWQCB by this NOI of their intention to collaboratively develop an WMP for the City of Los Angeles land area of J7 in the Santa Monica Bay Watershed, and will submit a Final Plan no later than 18 months after the effective date of the MS4 Permit (June 28, 2014)

Additionally, the City of Los Angeles and LACFCD notify the LARWQCB by this NOI of their intention to collaboratively develop a CIMP for the City of Los Angeles land area of J7 in the Santa Monica Bay Watershed, and will submit a Draft CIMP no later than 18 months after the effective date of the MS4 Permit (June 28, 2014).

3. Interim and final TDML compliance deadlines (Section VI.C.4.b.ii)

Table 1 lists the TMDLs that have been developed for the Santa Monica Bay watershed. The interim and final compliance deadline of the Santa Monica Bay Nearshore and Offshore TMDL and final compliance deadline of other TMDLs occurring prior to the anticipated approval date of WMP (April 28, 2015) are included in Table 2.

The watershed control measures that have been or will be implemented to meet the applicable interim and final trash water quality based effluent limitations (WQBELs) and all other final WQBELs and receiving water limitations are described in more detail in Section 10 of this NOI submittal.

Table 1. TMDLs applicable to Santa Monica Bay watershed

TMDL	LARWQCB Resolution Number	Effective Date and/or EPA Approval Date
Santa Monica Bay Beaches Dry Weather Bacteria TMDL (Summer and Winter Dry)	2002-004	7/15/2003
Santa Monica Bay Beaches Wet Weather Bacteria TMDL	2002-022	7/15/2003
Santa Monica Bay Nearshore and Offshore Debris TMDL	R10-010	03/20/2012
Santa Monica Bay DDTs and PCBs TMDL	NA	03/26/2012

Table.2. Interim (debris) and final TMDL compliance deadlines prior to WMP approval

TMDL	Milestone	Interim/Final	Deadline
Santa Monica Bay Beaches Dry Weather Bacteria TMDL	Compliance with allowable exceedance days during summer dry period	Final	07/15/2006
	Compliance with allowable exceedance days during winter dry period	Final	07/15/2009

4. Geographical scope (Section VI.C.4.b.iii.(1))

J7 of the Santa Monica Bay watershed is comprised of the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, and Rolling Hills Estate (collectively referred to as Peninsula Cities), and the City of Los Angeles. The City of Los Angeles area is approximately 976.61 acres, or 9.4% of the total area of J7 as shown in Attachment 1. J7 has unique characteristics that differentiate it from other Santa Monica Bay Jurisdictional Groups. Many of the storm drains on Palos Verdes Peninsula have outfalls on steep bluffs that are up to hundred feet high; some of these outfalls are at rocky points locations without safe access to the shoreline.

The City of Los Angeles land area of J7 includes open space from the White Point Nature Preserve Wild Park featuring 102 acres of restored coastal sage scrub habitat, hiking and handicap accessible trails overlooking the ocean and Catalina Island. Currently, there are three active shoreline stations for bacteria monitoring within the City of Los Angeles area of J7 (SMB 7-6, SMB 7-8, and SMB 7-9), and one inactive station (SMB 7-7), which is inaccessible and unsafe to enter due to a land slide in 2009 (Attachment B.2).

All drainage infrastructure operated and maintained by the LACFCD within the City of Los Angeles land area in J7 of the Santa Monica Bay Watershed Management Area will be covered under this WMP.

5. Cost estimate (Section VI.C.4.b.iii.(2))

The City of Los Angeles and the LACFCD collaboratively prepared a scope of work and cost estimate for developing the WMP Plan and, the CIMP for the City of Los Angeles' area in J7 of the Santa Monica Bay Watershed. It is estimated that the cost for the development of WMP Plan and the CIMP is approximately $50,000. Of that, 20% is allocated for the CIMP, and 80% for WMP. This estimate assumes that the CIMP and WMP will, in part, be based on the existing TMDL Coordinated Monitoring Plans and Implementation Plans.

6. Memorandum of understanding (Section VI.C.4.b.iii.(3))

At the time of submitting the NOI for an EWMP in June 2013, the City of Los Angeles and LACFCD agreed to executing a Memorandum of Understanding to share the cost for development of EWMP and CIMP. The City of Los Angeles and the LACFCD will determine at a later time whether to execute the original MOU, or to execute a revised MOU that reflects the intent to develop of a WMP. A copy of the original MOU and the letters of intent from both permittees can be found in the original NOI which was submitted on June 27, 2013.

7. Interim milestones and deadlines for plan development (section VI.C.4.b.iii.(4))

Table.4 summarizes the interim milestone and deadlines for the CIMP and WMP Plan development, which is based on the scope of work for developing the CIMP and WMP as agreed to by the City of Los Angeles and the LACFCD. Interim milestones in Table 4 are the expected due dates of draft Technical Memoranda and/or draft plans that will summarize the information and approaches for development of the specified components of the CIMP and WMP Plan. It is expected that the draft technical memos will not be finalized; rather, the information presented in the memos will be revised based on comments and presented in the CIMP and WMP Plan.

Table .4. Proposed interim milestones and deadlines for plan development

Deliverable	Milestones and Deadlines
Draft WMP Plan	April 2014
Final Draft WMP Plan submitted to the LARWQCB	June 2014
Coordinated Integrated Monitoring Program	
Draft Technical memos • Outfall and receiving water monitoring approach • Monitoring sites selection • New development and redevelopment effectiveness tracking	March 2014
Draft CIMP	April 2014
Final Draft CIMP submitted to the LARWQCB	June 2014

8. LID ordinance (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1))

Table 5 summarizes the status of Low Impact Development (LID) ordinances by the City of Los Angeles and LACFCD. As presented in Table 5, greater than 50% of the land area addressed by the geographical scope of the WMP is addressed by an LID ordinance that is in place.

Table 5. Summary of percent EWMP area addressed by LID ordinances

WMP agency	Status LID ordinance	% WMP area addressed by LID ordinance
City of Los Angeles	In place	100%
LACFCD	N/A	N/A
Total WMP Area covered by LID Ordinance		100%

RB-AR16623

In Place – Permittee has adopted an LID Ordinance that is in compliance with the requirements of the MS4 Permit for its portion in the watershed. For the City of Los Angeles: its LID Ordinance became operative on May 12, 2012. The City of Los Angeles is currently amending sections of the LID Ordinance, as well as its Stormwater and Urban Runoff Pollution Control Ordinance (L.A.M.C. Chapter VI, Article 4.4) to meet all the MS4 permit requirements.

9. Green street polices (Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2))

Table 6 summarizes the status of green street policies by the City of Los Angeles and the LACFCD. As presented in Table.6, greater than 50% of the land area addressed by the geographical scope of the WMP is addressed by green streets policies that are in place.

Table 6. Summary of percent WMP area addressed by Green Street Policies

WMP agency	Status of Green Street Policy	% WMP area addressed by Green Street Policy
City of Los Angeles	In place	100%
LACFCD	N/A	N/A
Total WMP Area covered by LID Ordinance		100%

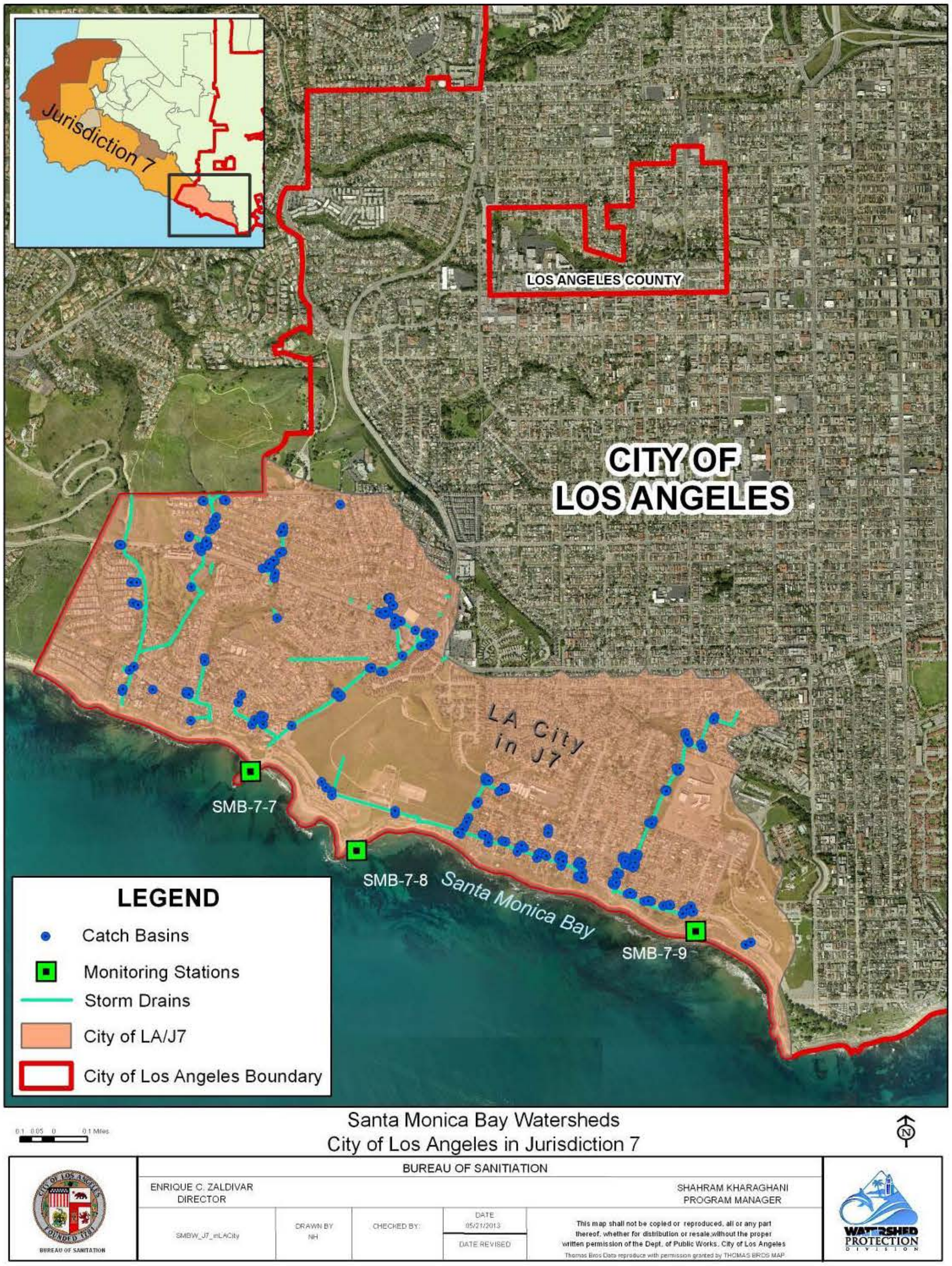
In Place – Permittee has adopted a Green Street Policy that is in compliance with the requirements of the MS4 Permit for its portion in the watershed.

10. Implementation of watershed control measures during plan development (Sections VI.C.4.b.ii)

The City of Los Angeles has implemented an extensive program of institutional measures (street sweeping, catch basin cleaning, public education, etc.) for pollution source control that supports reduction of bacteria discharges from the City of Los Angeles land area in J7 of the Santa Monica Bay watershed. In addition, the City will retrofit 50 catch basins with screens and/or inserts within its area to satisfy the 20% compliance milestone of the Santa Monica Bay Nearshore and Offshore Debris TMDL by March 2016.

Attachment 1. **The City of Los Angeles land area within J7 of the Santa Monica Bay Watershed.**

Attachment.2. The City of Los Angeles detailed land area within J7 of the Santa Monica Bay Watershed.



MEMORANDUM OF UNDERSTANDING
BETWEEN
THE CITY OF LOS ANGELES AND THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

REGARDING THE ADMINISTRATION AND COST SHARING FOR DEVELOPMENT OF THE ENHANCED WATERSHED MANAGEMENT PROGRAM FOR THE CITY OF LOS ANGELES AREA OF JURISDICTIONAL GROUP 7 OF THE SANTA MONICA BAY WATERSHED

This Memorandum of Understanding (MOU) is made and entered into as of the date of the last signature set forth below by and between the City of Los Angeles, a municipal corporation, and the Los Angeles County Flood Control District (LACFCD), a body corporate and politic. Collectively, these entities shall be known herein as “Parties” or individually as “Party.”

WITNESSETH

WHEREAS, the Regional Water Quality Control Board, Los Angeles Region (Regional Board) adopted National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Order No. R4-2012-0175 (MS4 Permit); and

WHEREAS, the MS4 Permit became effective on December 28, 2012 and requires that the LACFCD, County of Los Angeles, and 84 of the 88 cities (excluding Avalon, Long Beach, Palmdale, and Lancaster) within the County of Los Angeles comply with the prescribed elements of the MS4 Permit; and

WHEREAS, the MS4 Permit identified the Parties as the MS4 permittees that are responsible for compliance with the MS4 Permit requirements pertaining to the City of Los Angeles area in Jurisdictional Group 7 of the Santa Monica Bay Watershed; and

WHEREAS, the Parties have agreed to collaborate on the development of an Enhanced Watershed Management Program (EWMP) for the City of Los Angeles area in Jurisdictional Group 7 of the Santa Monica Bay Watershed to comply with certain elements of the MS4 Permit; and

WHEREAS, the Parties agree that each shall assume full and independent responsibility for ensuring its own compliance with the MS4 Permit despite the collaborative approach of this MOU; and

WHEREAS, the development of an EWMP includes the preparation of a Work Plan, a draft and final Coordinated Integrated Monitoring Plan (“CIMP”), and a draft and final Enhanced Watershed Management Program Plan ("EWMP Plan"), collectively referred to herein as "Plans"; and

WHEREAS, the Parties collaboratively prepared a final Scope of Work and Request for Proposal to obtain a Consultant for preparing the Plans that will satisfy the requirements of the MS4 Permit; and

WHEREAS, the PARTIES have determined that hiring a Consultant to prepare and deliver the Plans will be beneficial to the Parties and they desire to participate and will provide funding in accordance with the cost allocation formula shown in Table (3) of Exhibit A; and

WHEREAS, the Parties have agreed that the total cost for developing the Plans shall not exceed $52,500 including the project administration and management cost; and

WHEREAS, the Parties have agreed to retain the City of Los Angeles to coordinate the services of a Consultant to develop the Plans, the Parties have agreed to share in the cost and pay the City of Los Angeles for these consultant services as provided by Exhibit A of this MOU, and the City of Los Angeles has agreed to act on behalf of all Parties in the preparation of the Plans and the coordination of the consultant services;

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the Parties, and of the promises contained in this MOU, the Parties agree as follows:

Section 1. Recitals: The recitals set forth above are incorporated into this MOU.

Section 2. Purpose: The purpose of this MOU is to cooperatively fund the preparation and submittal of the Plans to the Regional Board.

Section 3. Cooperation: The Parties shall fully cooperate with one another to attain the purpose of this MOU.

Section 4. Voluntary: This MOU is voluntarily entered into for the purpose of preparing and submitting the Plans to the Regional Board.

Section 5. Term: This MOU shall become effective on the last date of execution by the Parties or December 28, 2013, whichever comes first, and shall remain and continue to remain in effect until June 30, 2016. If a Party does not execute this MOU by December 28, 2013, that Party shall be excluded from this MOU and this MOU shall become effective on December 28, 2013 by execution by the remaining Party.

Section 6. Assessment for Proportional Cost: The LACFCD agrees to pay the City of Los Angeles for preparation and delivery of the Plans in the amounts shown in Table (4) of Exhibit A, based on the total costs shown in Tables (1) and (2) and the cost allocation formula shown in Table (3) of Exhibit A, attached hereto and made part of this MOU by this reference. The City of Los Angeles will invoice the LACFCD in two installments upon execution of this MOU as shown in Table (4) of Exhibit A, based on the allocated costs for developing the Plan and the project administration and management costs at a percentage not to exceed 5% of the allocated costs for development of the Plan. At the end of each fiscal year, the City of Los Angeles will provide the LACFCD with a statement with the actual expenditures. Unexpended funds at the termination of this MOU will be reimbursed to the LACFCD in accordance with the cost allocation formula set forth in Table (3) of Exhibit A

Section 7. City of Los Angeles agrees:

a. To solicit proposals for, award and administer a Consultant contract for the preparation and delivery of the Plans. The City of Los Angeles will be compensated for the administration and management of the Consultant contract as described in Exhibit A.

b. To utilize the funds deposited by the Parties only for the administration of the Consultant contract, project management, and the preparation and completion of the Plans.

c. To provide the Parties with an electronic copy of the technical memos, draft Plans and completed Plans within 7 business days of receipt from the Consultant.

d. To invoice the Parties in the amounts and according to the schedule shown in Table (4) of Exhibit A.

e. To provide an accounting within 90 days of the termination of this MOU or within 90 days after the early termination of the MOU pursuant to Section 11. The City of Los Angeles shall return the unused portion of all funds deposited with the City of Los Angeles in accordance with the cost allocation formula set forth in table (3) of Exhibit A.

Section 8. The Parties further agree:

a. To make a full faith effort to cooperate with one another to achieve the purposes of this MOU by providing information about project opportunities, reviewing deliverables in a timely manner, and informing their respective administration, agency heads, and/or governing body.

b. To fund the cost of the preparation and delivery of the Plans and to pay the City of Los Angeles for the preparation and delivery of the Plans based on the cost allocation shown in Table (3) of Exhibit A. This includes the costs incurred by the City of Los Angeles for administering the Consultant services between awarding the Consultant contract and the execution of this MOU.

c. To grant access rights and entry to the City of Los Angeles and the Consultant during the terms of this MOU to the Parties' facilities (i.e. storm drains, channels, catch basins, properties, etc.) ("Facilities") to achieve the purposes of this MOU. Prior to exercising said right of entry, the City of Los Angeles or their Consultant shall provide written notice to the LACFCD at least 72 hours in advance. For the purposes of this provision, written notice shall include notice delivered via e-mail that has been delivered to the LACFCD's representatives identified in Exhibit B.

Section 9. Invoice and Payment

a. Payment: The LACFCD shall pay the City of Los Angeles their proportional share of the cost for the preparation and delivery of the Plans and project administration and management as shown in Table (4) of Exhibit A. Payments are due within sixty (60) days of receiving the invoice from the City of Los Angeles.

b. Invoice: The City of Los Angeles will invoice LACFCD in two installments in the amounts shown in Table (4) of Exhibit A. The first invoice will be sent upon execution of this MOU or in January 2014, whichever comes first. The second invoice will be sent in July 2014.

c. Contingency: The City of Los Angeles will notify the LACFCD if actual expenditures are anticipated to exceed the cost estimates contained in Exhibits A and obtain written approval of such expenditures from all Parties. Upon approval, the LACFCD agrees to reimburse the City of Los Angeles for their proportional share of these additional expenditures at an amount not to exceed 10% of the original cost estimate as shown in Exhibit A. This 10% contingency will not be invoiced, unless actual expenditures exceed the original cost estimate. Expenditures that exceed the 10% contingency will require an amendment of this MOU.

Section 10. Indemnification

a. Each Party shall indemnify, defend, and hold harmless each other Party, including its special districts, elected and appointed officers, employees, and agents, from and against any and all liability, including but not limited to demands, claims, actions, fees, costs, and expenses (including attorney and expert witness fees), arising from or connected with the respective acts of each Party arising from or related to this MOU; provided, however, that no party shall indemnify another party for that party's own negligence or willful misconduct.

b. In light of the provisions of Section 895.2 of the Government Code of the State of California imposing certain tort liability jointly upon public entities solely by reason of such entities being parties to an agreement (as defined in Section 895 of said Code), each of the Parties hereto, pursuant to the authorization contained in Section 895.4 and 895.6 of said Code, shall assume the full liability imposed upon it or any of its officers, agents, or employees, by law for injury caused by any act or omission occurring in the performance of this MOU to the same extent that such liability would be imposed in the absence of Section 895.2 of said Code. To achieve the above stated purpose, each Party indemnifies, defends, and holds harmless each other Party for any liability, cost, or expense that may be imposed upon such other Party solely by virtue of said Section 895.2. The provisions of Section 2778 of the California Civil Code are made a part hereof as if incorporated herein.

Section 11. Termination

a. This MOU may be terminated upon the express written agreement of all Parties. If this MOU is terminated, all Parties must agree on the equitable redistribution of remaining funds deposited, if there are any, or payment of invoices due at the time of termination. Completed work shall be owned by all Parties. Rights to uncompleted work by the Consultant still under contract will be held by the Party or Parties who fund the completion of such work.

b. If a Party fails to comply with any of the terms or conditions of this MOU, that Party shall forfeit its rights to the work completed through this MOU, but no such forfeiture shall occur unless and until the defaulting Party has first been given notice of its default and a reasonable opportunity to cure the alleged default.

Section 12. General Provisions

a) <u>Notices</u>. Any notices, bills, invoices, or reports relating to this MOU, and any request, demand, statement or other communication required or permitted hereunder shall be in writing and shall be delivered to the Representative of the Party at the address set forth in Exhibit B. Parties shall promptly notify each other of any change of contact information, including personnel changes, provided in Exhibit B. Written notice shall include notice delivered via email or fax. A notice shall be deemed to have been received on (a) the date of delivery, if delivered by hand during regular business hours, or by confirmed facsimile or by email; or (b) on the third (3) business day following mailing by registered or certified mail (return receipt requested) to the addresses set forth in Exhibit B.

b) Administration. For the purpose of this MOU, the parties hereby designate as their respective Party Representatives the persons named in Exhibit B. The designated Party Representatives, or their respective designees, shall administer the terms and conditions of this MOU on behalf of their respective Party. Each of the persons signing below on behalf of a Party represents and warrants that they are authorized to sign this MOU on behalf of such Party.

c) Relationship of Parties. The Parties are and shall remain at all times as to each other, wholly independent entities. No Party to this MOU shall have power to incur any debt, obligation, or liability on behalf of another Party unless expressly provided to the contrary by this MOU. No employee, agent, or officer of a Party shall be deemed for any purpose whatsoever to be an agent, employee or officer of another Party.

d) Binding Effect. This MOU shall be binding upon and inure to the benefit of each Party to this MOU and their respective heirs, administrators, representatives, successors and assigns.

e) Amendment. The terms and provisions of this MOU may not be amended, modified, or waived, except by an instrument in writing signed by all the Parties. For the City of Los Angeles, the Director of Bureau of Sanitation or his/her designee is authorized to execute such amendments.

f) Waiver. Waiver by any Party to this MOU of any term, condition, or covenant of this MOU shall not constitute a waiver of any other term, condition, or covenant. Waiver by any Party to any breach of the provisions of this MOU shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this MOU.

g) Law to Govern; Venue. This MOU shall be interpreted, construed and governed according to the laws of the State of California. In the event of litigation between the Parties, venue in the state trial courts shall lie exclusively in the County of Los Angeles.

h) No Presumption in Drafting. The Parties to this MOU agree that the general rule that an MOU is to be interpreted against the Party drafting it, or causing it to be prepared shall not apply.

i) Entire Agreement. This MOU constitutes the entire agreement of the Parties with respect to the subject matter hereof and supersedes all prior or contemporaneous agreements, whether written or oral, with respect thereto.

j) Severability. If any term, provision, condition or covenant of this MOU is declared or determined by any court or competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this MOU shall not be affected thereby and this MOU shall be read and constructed without the invalid, void, or unenforceable provision(s).

k) Counterparts. This MOU may be executed in any number of counterparts, each of which shall be an original, but all of which taken together shall constitute but one and the same instrument, provided, however, that such counterparts shall have been delivered to all Parties to this MOU.

l) All Parties have been represented by counsel in the preparation and negotiation of this MOU. Accordingly, this MOU shall be construed according to its fair language.

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed by their duly authorized representatives and affixed as of the date of signature of the Parties:

CITY OF LOS ANGELES

Date: 12-20-2013

C-123494

By: ____________________
Kevin James, President
Board of Public Works

ATTEST:

By: ____________________
Holly L. Wolcott
Interim City Clerk

APPROVED AS TO FORM:

Michael N. Feuer
City Attorney

By: ____________________
John A. Carvalho
Deputy City Attorney

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By ______________________________ 11/7/13
for GAIL FARBER, Chief Engineer | Date

APPROVED AS TO FORM:

John F. Krattli
County Counsel

By ______________________________ 10/29/2013
Senior Associate | Date

EXHIBIT A

Santa Monica Bay Watershed
Jurisdictional Group 7 City of Los Angeles Area
EWMP
Funding Contributions

Table 1. Consultant Contract Costs

Deliverable	Deliverable Due Date	Cost
Work Plan	June 28, 2014	$ 9000
CIMP	June 28, 2014	$ 7,500
EWMP Plan	June 28, 2015 (draft plan) April 28, 2016 (final plan)	$ 22,000
Project Management Coordination & Meetings	On going	$11,500
Contract Cost	**-**	**$ 50,000**

Table 2. Total Cost

Item	Cost
Consultant Contract	$50,000
Project Administration & Management (5%)	$2,500
Total Cost	**$52,500**
Flood Control District Contribution (10%)	-$5,250
Cost for area cost sharing	**$47,250**

Table 3. Cost Allocation Formula for Area Cost Sharing

Party	Acres	Percent of Area[(1)]	Total Cost
City of Los Angeles		**100%**	$47,250
Total		**100%**	**$47,250**

Table 4.City of Los Angeles Invoicing Schedule and Invoice Amounts to Parties

Invoice Date[1]	LACFCD Invoice
January 2014	$2,625
July 2014	$2,625
Total Invoice Amount[1]	**$5,250**
10% Contingency	$525
Total including 10% contingency	**$5,775**

[1]Contingency is 10% of the total estimated cost. Contingency will not be invoiced unless there is a need for its expenditure as agreed by all Parties.

EXHIBIT B

Santa Monica Bay Watershed
Jurisdictional Group 7 City of Los Angeles Area
Responsible Agencies Representatives

1. City of Los Angeles
   Department of Public Works
   Bureau of Sanitation, Watershed Protection Division
   1149 S. Broadway
   Los Angeles, CA 90015

   Shahram Kharaghani
   E-mail: Shahram.Kharaghani@Lacity.org
   Phone: (213) 485-0587
   Fax: (213) 485-3939

2. Los Angeles County Flood Control District
   Department of Public Works
   Watershed Management Division, 11th Floor
   900 South Fremont Avenue
   Alhambra, CA 91803-1331

   Gary Hildebrand
   E-mail: GHILDEB@dpw.lacounty.gov
   Phone: (626) 458-4300
   Fax: (626) 457-1526

March 12, 2014

Dr. Shahram Kharaghani
City of Los Angeles
Department of Public Works, Bureau of Sanitation
Watershed Protection Division
1149 South Broadway, 10th Floor
Los Angeles, CA 90015

Ms. Gail Farber, Chief Engineer
Los Angeles County Flood Control District
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

APPROVAL OF REVISED NOTIFICATION OF INTENT TO DEVELOP A WATERSHED MANAGEMENT PROGRAM FOR THE CITY OF LOS ANGELES AREA IN SANTA MONICA BAY SUBWATERSHED JURISDICTIONAL GROUP 7, PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT (NPDES PERMIT NO. CAS004001; ORDER NO. R4-2012-0175)

Dear Dr. Kharaghani and Ms. Farber:

In a letter dated November 26, 2013, the California Regional Water Quality Control Board, Los Angeles Region (Regional Water Board or Board) provided its review of the Santa Monica Bay (SMB) Subwatershed Jurisdictional Group 7 (J7) notification of intent (NOI) to develop an enhanced watershed management program. After discussions between the City of Los Angeles (City) and the Regional Water Board the City elected to develop a watershed management program (WMP).

On December 16, 2013, the Board received the revised NOI to develop a WMP for the City of Los Angeles' land area within Jurisdictional Group 7 of the Santa Monica Bay Subwatershed. Regional Water Board staff has reviewed the revised NOI for compliance with all notification requirements of Part VI.C of Order No. R4-2012-0175 and has determined that all the notification requirements have been met.

The draft WMP for the City of Los Angeles' land area within J7 of the Santa Monica Bay Subwatershed is due by June 28, 2014. Please submit the plan to losangeles@waterboards.ca.gov with the subject line "LA County MS4 Permit – Watershed Management Program" with copies to Ivar.Ridgeway@waterboards.ca.gov and Rebecca.Christmann@waterboards.ca.gov.

If you have any questions, please contact Mr. Ivar Ridgeway, Storm Water Permitting, at (213) 620-2150 or Ms. Rebecca Christmann at (213) 576-6786.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

cc: Hubertus Cox, City of Los Angeles
Hamid Tadayon, City of Los Angeles
Gary Hildebrand, Los Angeles County Flood Control District
David Smith, NPDES Program, USEPA Region IX
Jennifer Fordyce, Office of Chief Counsel, State Water Board

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

BUREAU OF SANITATION

ENRIQUE C. ZALDIVAR
DIRECTOR

TRACI J. MINAMIDE
CHIEF OPERATING OFFICER

VAROUJ S. ABKIAN
ADEL H. HAGEKHALIL
ALEXANDER E. HELOU
ASSISTANT DIRECTORS

VACANT
CHIEF FINANCIAL OFFICER

1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939
WWW.LACITYSAN.ORG

June 27, 2014

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

Dear Mr. Unger:

SUBMITTAL OF WATERSHED MANAGEMENT PROGRAM FOR THE CITY OF LOS ANGELES AREA IN JURISDICTIONAL GROUP 7 OF THE SANTA MONICA BAY WATERSHED

Please find attached the Watershed Management Program (WMP) for the City of Los Angeles area in Jurisdictional Group 7 of the Santa Monica Bay watershed. The City of Los Angeles, as lead agency for this area, has prepared this WMP on behalf of itself and the Los Angeles County Flood Control District (LACFCD). LACFCD has reviewed the draft WMP prior to submission to the Regional Water Board, and we appreciate their collaboration in the preparation of the document.

The City of Los Angeles and LACFCD originally intended to develop an Enhanced Watershed Management Program (EWMP) for the City of Los Angeles area in Jurisdictional Group 7, as indicated in our Notice of Intent jointly submitted with the Notice of Intent or Jurisdictional Groups 2 and 3 on June 27, 2013. However, Regional Board staff requested the City of Los Angeles and LACFCD to develop a WMP instead of an EWMP because of antidegradation conditions in Jurisdictional Group 7 and limited opportunities for implementation of regional projects capable of capturing and retaining runoff from the 85th percentile storm event. Accordingly, the City of Los Angeles and LACFCD submitted a revised Notice of Intent for a WMP for the City of Los Angeles area in Jurisdictional Group 7 on December 16, 2013.

The WMP for the City of Los Angeles area in Jurisdictional Group 7 mostly relies on implementing the Minimum Control Measures as provided by section VI.D of the new MS4 Permit (Order No. R4-2012-0175), because of the aforementioned antidegradation conditions and limited opportunities for regional projects with groundwater recharge. In addition, water quality data pertaining to this area and information of potential sources and quantities of urban runoff pollutants are very limited at this time. Accordingly, implementation of the Coordinated Integrated Monitoring Program will indicate if there is a need to identify additional structural watershed control measures through the adaptive management process for the WMP for the City of Los Angeles area in jurisdictional Group 7.

We appreciate the discussions with and the input received from Regional Water Board staff during the development of this WMP and we look forward to the comments on the WMP by your staff and finalizing this document.

Should you have any questions about this submittal, please contact me at Shahram.Kharaghani@lacity.org or phone (213) 485-0587, or your staff may contact Dr. Huub Cox at Hubertis.Cox@lacity.org or phone (213) 485-3984.

Sincerely,

Robert Vega for

SHAHRAM KHARAGHANI, Ph.D., P.E., BCEE
Program Manager

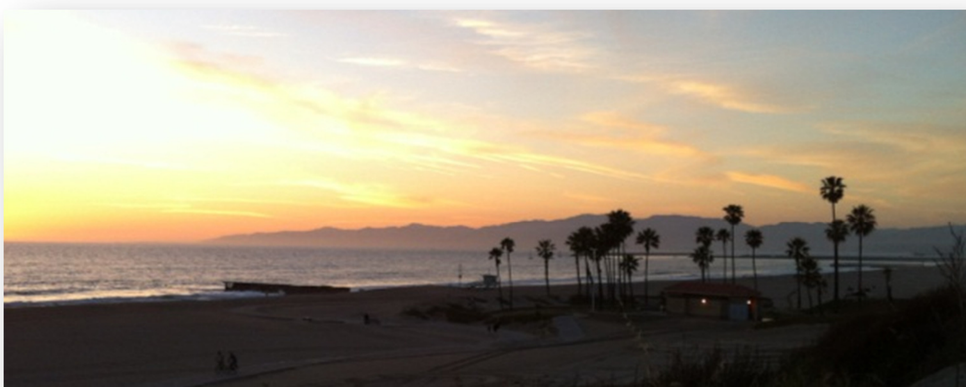
SK:HC
WPDCR9133

Attachment

cc: Renee Purdy, California Regional Water Quality Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Board, Los Angeles Region
Adel Hagekhalil, City of Los Angeles, Bureau of Sanitation
Donna Chen, City of Los Angeles, Bureau of Sanitation
Gary Hildebrand, County of Los Angeles, Department of Public Works

Watershed Management Program for Santa Monica Bay Jurisdictional Group 7 with the City of Los Angeles

Prepared by:
City of Los Angeles
Los Angeles County Flood Control District



The MWH Team

MWH Geosyntec consultants CWE M2 Resource Consulting, Inc.

RB-AR16641

Table of Contents

Section Name | **Page Number**

1 Introduction 1

1.1 Background and Regulatory Framework 1

1.2 SMB JG7 WMP Group Geographical Area 2

1.3 Watershed Management Program Development Process 5

1.4 Watershed Management Program Plan Overview 5

2 Identification of Water Quality Priorities 6

2.1 Water Quality Characterization 6

2.1.1 Water Quality Objectives/Criteria 7

2.1.2 QA/QC Criteria 10

2.1.3 Detailed Data Analysis 10

2.1.4 TMDL Compliance Status 10

2.1.5 Other Water Body-Pollutant Combinations that meet 303(d) Listing Criteria 13

2.1.6 Remaining Water Body-Pollutant Combinations Demonstrating Exceedance(s) of Applicable Receiving Water Limitations 13

2.2 Water Body-Pollutant Prioritization 14

2.2.1 Category 1 – Highest Priority 15

2.2.2 Category 2 – High Priority 16

2.2.3 Category 3 – Medium Priority 16

2.3 Source Assessment 16

2.3.1 Indicator Bacteria 17

2.3.2 DDT and PCBs 18

3 Watershed Control Measures 19

3.1 Minimum Control Measures/Institutional BMPs 19

3.1.1 Customization of MCMs 23

3.1.2 MCMs and Outcome Levels 24

3.1.3 Next Steps to MCM Customization 25

4 Reasonable Assurance Analysis 28

4.1 Bacteria 28

4.2 PCBs and DDTs 28

4.3 Debris, and Plastic Pellets 29

5 Adaptive Management Process 30

RB-AR16642

5.1 Compliance Schedule 30
5.2 Re-Characterization of Water Quality Priorities 31
5.3 Source Assessment Re-evaluation 31
5.4 Effectiveness Assessment of Watershed Control Measures 31
5.5 Update of Reasonable Assurance Analysis 31
6 References 33
Attachment A: 37

List of Acronyms

Acronym	Definition
AED	Allowable Exceedance Day
ASBS	Areas of Special Biological Significance
Basin Plan	Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
BIOL	Preservation of Biological Habitats of Special Significance Beneficial Use Designation
BMP	Best Management Practice
CALTRANS	California Department of Transportation
CASQA	California Stormwater Quality Association
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIMP	Coordinated Integrated Monitoring Program
City	City of Los Angeles
COMM	Commercial and Sport Fishing Beneficial Use Designation
CSMP	Coordinated Shoreline Monitoring Plan
CWA	Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
ED	Exceedance Day
EMC	Event Mean Concentration
ES	Executive Summary
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment Control Plan
EWMP	Enhanced Watershed Management Program
FC	Fecal Coliform
FIB	Fecal Indicator Bacteria
g/yr	Grams per Year
GM	Geometric Mean
IC/ID	Illicit Connections and Illicit Discharges
IND	Industrial Service Supply Beneficial Use Designation
JG	Jurisdictional Group
JG7	Jurisdictional Group 7 of the City of Los Angeles
L-SWPPP	Local Storm Water Pollution Prevention Plan
LACFCD	Los Angeles County Flood Control District
LFD	Low-Flow Diversion
LID	Low Impact Development
MAR	Marine Habitat Beneficial Use Designation

List of Acronyms

Acronym	Definition
MCM	Minimum Control Measure
mg/l	Milligrams per Liter
MIGR	Migration of Aquatic Organisms Beneficial Use Designation
MPN/ml	Most Probable Number of Organisms per Milliliter
MRP	Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
MWH	MWH Americas, Inc.
N	Nitrogen
NA	Not Applicable
NAICS	North American Industry Classification System
NAV	Navigation Beneficial Use Designation
ND	Non-Detects
ng/L	Nanograms per Liter
NH_3	Ammonia
NO_3	Nitrate
NPDES	National Pollutant Discharge Elimination System
OPTI	Online Project Tracking and Integration System
PCB	Polychlorinated Biphenyl
Permit	Los Angeles Regional Water Quality Control Board Order No. R4-2012-0175
PIPP	Public Information and Participation Program
PMRP	Plastic Pellet Monitoring and Reporting Program
POTW	Publically-Owned Treatment Works
PR	Percent Removal
QA/QC	Quality Assurance/Quality Control
RAA	Reasonable Assurance Analysis
RARE	Rare, Threatened, or Endangered Species Beneficial Use Designation
Regional Board	Los Angeles Regional Water Quality Control Board
RWL	Receiving Water Limitation
SCBPP	Southern California Bight Pilot Project
SCCWRP	Southern California Coastal Water Research Project
SHELL	Shellfish Harvesting Beneficial Use Designation
SIC	Standard Industrial Classification
SMB	Santa Monica Bay
SMBB	Santa Monica Bay Beaches
SMB JG7 WMP Group	Santa Monica Bay Jurisdictional Group 7 Watershed Management Program Group
SMB WMA	Santa Monica Bay Watershed Management Area
SMURRF	Santa Monica Urban Runoff Recycling Facility
SPWN	Spawning, Reproduction, and/or Early Development Beneficial Use Designation

Acronym	Definition
SQMP	Stormwater Quality Management Plan
SUSMP	Standard Urban Stormwater Mitigation Plan
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
TMRP	Trash Monitoring and Reporting Plan
TP	Total Phosphorus
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
WBPCs	Water Body-Pollutant Combinations
WDID	Waste Discharger Identification
WILD	Wildlife Habitat Beneficial Use Designation
WMA	Watershed Management Area
WMP	Watershed Management Program
WQBEL	Water Quality-Based Effluent Limitation

1 Introduction

1.1 Background and Regulatory Framework

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) has been a participating agency of Jurisdictional Group 7 (JG7) of the Santa Monica Bay Watershed since the adoption of the Santa Monica Bay Beaches Bacteria Total Maximum Daily Loads (TMDLs) in 2003. However, the City of Los Angeles and the other MS4 permittees in JG7 could not reach an agreement for a collaborative approach to satisfying the requirements of the MS4 permit. Therefore, on November 26, 2013 the Regional Board requested that the City and the Los Angeles County Flood Control District (LACFCD), collectively referred to as the Santa Monica Bay JG7 WMP Group (SMB JG7 WMP Group), pursue a WMP instead of an EWMP. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural best management practice (BMP) implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). In December of 2013, the SMB JG7 WMP Group submitted a revised Notice of Intent to develop a WMP for the City of Los Angeles land area within the JG7 area to fulfill the requirements of the Permit.

This WMP, in combination with the JG7 Coordinate Integrated Monitoring Program (CIMP), was prepared to satisfy Part C.1.f of the Permit, which includes the following tasks:

1. Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters within each Watershed Management Area (WMA);
2. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d;
3. Execute an integrated monitoring program and assessment program pursuant to Attachment E – MRP, Part VI to determine progress towards achieving applicable limitations and/or action levels in Attachment G;
4. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the monitoring and reporting program (MRP) to ensure that applicable WQBELs, RWLs and other milestones set forth in the WMP are achieved in the required timeframes; and
5. 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 WMPs and EWMPs from month 6 through the date of program approval.

1.2 SMB JG7 WMP Group Geographical Area

The SMB JG7 WMP Group area is located within the southern portion of the Santa Monica Bay WMA, which encompasses an area of approximately 414 square miles and includes the Santa Monica Bay and land area that drains into the Bay. The boundary of the Santa Monica Bay, as defined for the National Estuary Program, extends from the Los Angeles/Ventura County line to the northwest, southeast toward Point Fermin located on the Palos Verdes Peninsula. The land area that drains into the Bay follows the crest of the Santa Monica Mountains on the north to Griffith Park; then extends south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek, the natural drainage is a narrow coastal strip between Playa del Rey and Palos Verdes (Regional Board, 2011). **Figure 1-1** depicts the location of the SMB JG7 WMP Group within the Santa Monica Bay Watershed.

The full JG7 area includes the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, Rolling Hills Estate, and the City of Los Angeles. This SMB JG7 WMP only addresses the area owned by the City and LACFCD within JG7, which includes the following water bodies as listed in the Basin Plan:

- Los Angeles County Coastal Nearshore Zone
- Royal Palms Beach
- Whites Point County Beach

The SMB JG7 WMP area, which consists of land owned by the City and includes any LACFCD infrastructure, totals approximately 977 acres, which is approximately 9% of the entire JG7 area within the Santa Monica Bay Watershed. **Figure 1-1** illustrates the extent of the SMB JG7 WMP Group Area. The geographical scope of the SMB JG7 WMP Group area excludes areas of land totaling approximately 47 acres for which the MS4 permittees do not have jurisdiction, including land owned by the Los Angeles Air Force Base Pacific Crest Housing Area. With the exclusion of these areas, the SMB JG7 WMP area covers 907 acres. The majority of the land uses within the WMP area consist of residential (approximately 69%) and vacant/open space (approximately 26%), with the remaining area consisting of a mixture of commercial, educational, and industrial land uses. There are no designated transportation or agricultural land uses in the WMP area. The open space area includes 102 acres of restored coastal sage scrub habitat and hiking trails located within the White Point Nature Preserve Wild Park.

Table 1-1
SMB JG7 WMP Land Use Summary

Land Use	% of Total
Commercial	3%
Industrial	0.1%
Education	3%
Multi-Family Residential	12%
Single Family Residential	56%
Open Space	26%
Total	100%

The City of Los Angeles JG7 WMP area includes 218 catch basins and seven storm drain outfalls owned and operated by either the City of Los Angeles or the LACFCD. The majority of the storm drain outfalls in the SMB JG7 WMP area are circular pipes extending from the Cliffside, around one hundred feet above the rocky shoreline. The majority of the outfalls themselves are inaccessible at the pipe outlet.

Introduction

The coastline along, and several inland sites within, the SMB JG7 WMP area is characterized as being subject to landslide and liquefaction hazards (City of Los Angeles Bureau of Engineering, 2014). This characterization was exemplified by the destruction of the SMB 7-7 TMDL shoreline monitoring site due to landslide in 2009.

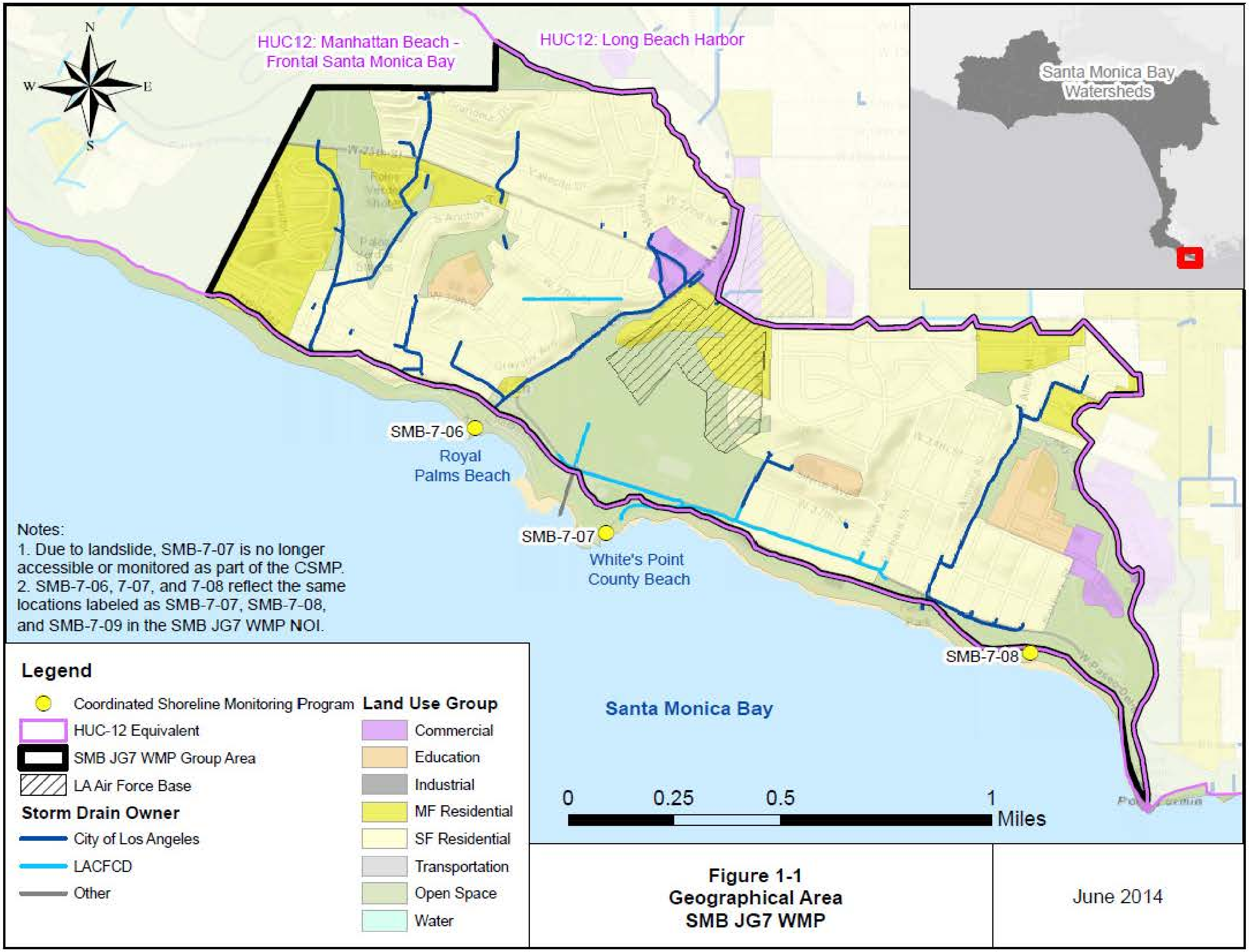


Figure 1-1
Geographical Area
SMB JG7 WMP

RB-AR16650

1.3 Watershed Management Program Development Process

The WMP for the SMB JG7 WMP Group includes four major components, as follows:

1. **Water Quality Priorities:** The identification of water quality priorities is an important first step in the WMP process. Water quality priorities, described in Section 2, are defined for individual constituents within a specific water body, termed as Water Body-Pollutant Combinations (WBPCs). Categories of the WBPCs are defined in the Permit. Priorities are assigned to the WBPCs based on the categorization. The water quality priorities will provide the basis for prioritizing implementation activities within the WMP.

2. **Watershed Control Measures/Minimum Control Measures:** Development of the WMP requires identification of control measures/BMPs, as described in Section 4, expected to be sufficient to meet receiving water and effluent limitations set forth in the MS4 Permit (Regional Board, 2012). BMPs vary in function and type, with each BMP providing unique design characteristics and benefits from implementation. The overarching goal of BMPs in the WMP is to reduce the impact of stormwater and non-stormwater runoff on receiving water quality.

3. **Reasonable Assurance Analysis:** A key element of each WMP is the reasonable assurance analysis (RAA), described in Section 4, which is used to demonstrate *"…that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term"* (Section C.5.b.iv.(5), page 63). The Permit prescribes the RAA as a quantitative demonstration that control measures, specifically BMPs, will be effective. In other words, the RAA not only demonstrates the cumulative effectiveness of BMPs to be implemented, but it also supports their selection. However, due to zero target load reductions and alternative compliance measures for the identified WBPCs, a quantitative analysis is not necessary at this time. Therefore, the SMB JG7 WMP group has decided to present a qualitative RAA discussion, acknowledging that a quantitative RAA may become necessary in the future based on results of future CIMP monitoring.

4. **Adaptive Management Process:** The WMP is intended to be implemented as an adaptive program as described in Section 5. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time.

1.4 Watershed Management Program Overview

This WMP has been prepared to outline the steps that will be taken by the SMB JG7 WMP Group in compliance with the requirements and deadlines set forth within the MS4 Permit. This document is organized into the following sections:

- **Section 1 –** Introduction
- **Section 2** – Identification of Water Quality Priorities
- **Section 3** – Watershed Control Measures
- **Section 4** – Reasonable Assurance Analysis Approach
- **Section 5** – Adaptive Management Process
- **Section 6** – References

2
Identification of Water Quality Priorities

To develop the WMP, the Permit requires that SMB JG7 WMP Group establish water quality priorities within their WMA. In accordance with the Permit Section IV.C.5(a), this section characterizes the water quality conditions within the SMB JG7 WMP area, identifies water quality priorities, determines water body-pollutant classifications, and assesses pollutant sources. The water quality priorities identified in this section provide the basis for prioritizing project implementation; selecting and scheduling BMPs (if needed); and focusing monitoring activities developed in the CIMP.

2.1 Water Quality Characterization

Figure 2-1 identifies the receiving waters in the SMB JG7 WMP Group area, as depicted in the Water Quality Control Plan, Los Angeles Region (Basin Plan) (Regional Board, 1995, Updated 2011). **Table 2-1** summarizes the beneficial uses for each of these water bodies, as designated in the Basin Plan. As beneficial uses designated as "potential" have not yet been established, these uses will not be evaluated further in the WMP. The SMB JG7 WMP Group area includes the water bodies listed below.

- Los Angeles County Coastal Nearshore Zone
- Royal Palms Beach
- Whites Point County Beach

Beneficial use designations for these water bodies include the following:

- **Water Contract Recreation (REC-1):** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2):** Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- **Industrial Services Supply (IND):** Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, firs protection, or oil well re-pressurization.
- **Navigation (NAV):** Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
- **Commercial and Sport Fishing (COMM):** Uses of water for commercial or recreational collection of fish, shellfish, or other organisms intended for human consumption or bait purposes.
- **Marine Habitat (MAR):** Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).
- **Preservation of Biological Habitats (BIOL):** Uses of water that support designated areas of habitats, such as Areas of Special Biological Significance (ASBS), established refuges, parks,

sanctuaries, ecological reserves, or other areas where the preservation or enhancement of natural resources requires special protection.

- **Migration of Aquatic Organisms (MIGR):** Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
- **Spawning, Reproduction, and/or Early Development (SPWN):** Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
- **Shellfish Harvesting (SHELL):** Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.
- **Wildlife Habitat (WILD):** Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- **Rare, Threatened, or Endangered Species (RARE):** Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

Table 2-1
Beneficial Uses of Water Bodies and Coastal Features Designated in the Basin Plan

Water Body (and Tributaries)	Beneficial Uses											
	REC-1	REC-2	WILD	RARE	IND	NAV	COMM	MAR	BIOL	MIGR	SPWN	SHELL
Los Angeles County Coastal Nearshore Zone^	E	E	E	Ee	E	E	E	E	Ean	Ef	Ef	E
Royal Palms Beach	E	E	E			E	E	E			P	E
Whites Point County Beach	E	E	E			E	E	E			P	E

E = Existing beneficial use

P = Potential beneficial use

e = One or more rare species utilizes all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f = Aquatic organisms utilize all bays, estuaries, lagoons, and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas that are heavily influenced by freshwater inputs.

an = Areas of Special Biological Significance (along coast from Latigo Point to Laguna Point) and Big Sycamore Canyon and Abalone Cove Ecological Reserves and Point Fermin Marine Life Refuge.

^ = Nearshore is defined as the zone bounded by the shoreline or the 30-foot depth contours, whichever is further from the shoreline. Longshore extent is from Rincon Creek to the San Gabriel River Estuary.

2.1.1 Water Quality Objectives/Criteria

The Clean Water Act (CWA) requires that the State Water Resources Control Board (SWRCB) and Regional Boards conduct a water quality assessment that addresses the condition of its surface waters [required in Section 305(b) of the CWA] and provides a list of impaired waters [required in CWA Section 303(d)] that is then submitted to the U.S. Environmental Protection Agency (USEPA) for review and approval. The 2010 Integrated Report and updated 303(d) list were approved by the SWRCB on August 4, 2010 and by the USEPA on October 11, 2011. The 2010 303(d)-listed water bodies and associated pollutants within the SMB JG7 WMP Group area are summarized in **Table 2-2**.

Table 2-2
2010 303(d)-Listed Water Bodies in the SMB JG7 WMP Group Area

Water Body	Pollutant Class	Pollutant	Notes
Santa Monica Bay Beaches	Pathogens	Coliform Bacteria	Addressed by Bacteria TMDL
	Pesticides	DDT	Addressed by PCB/DDT TMDL
	Other Organics	PCBs	Addressed by PCB/DDT TMDL
Santa Monica Bay (Los Angeles County Coastal Nearshore Zone)	Trash	Debris Plastic Pellets	Addressed by Trash TMDL
	Pesticides	DDT (tissue & sediment)	Addressed by PCB/DDT TMDL
	Other Organics	PCBs (tissue & sediment)	Addressed by PCB/DDT TMDL
	Toxicity	Sediment Toxicity	Addressed by PCB/DDT TMDL
	Miscellaneous	Fish Consumption Advisory	Addressed by PCB/DDT TMDL

Water bodies are subject to water quality objectives in the Basin Plan, or Basin Plan Amendments, such as those to implement TMDLs. There are currently three TMDLs in effect for the water bodies within the SMB JG7 WMP Group area as listed in Attachment M of the Permit. These TMDLs are summarized in **Table 2-3**.

Table 2-3
Santa Monica Bay TMDLs

TMDL Name	Agency	Effective Date
SMB Beaches Bacteria TMDL, Reconsideration of Certain Technical Matters of the SMB Beaches Bacteria TMDL, Resolution R12-007[a]	Regional Board	Not yet effective
SMB TMDL for DDT and PCBs	USEPA	March 26, 2012
SMB Nearshore Debris TMDL, Resolution R10-010	Regional Board	March 20, 2012
SMB Beaches Bacteria TMDL, Dry Weather, Resolution 2002-004[b]	Regional Board	July 15, 2003
SMB Beaches Bacteria TMDL, Wet Weather, Resolution 2002-022[b]	Regional Board	July 15, 2003

[a] This TMDL revision is not yet approved by USEPA.
[b] This TMDL was revised pursuant to Resolution R12-2007.

Table 2-4 identifies the applicable WQBELs and/or RWLs established pursuant to TMDLs included in Attachment M of the Permit. The water quality objectives as listed in the Basin Plan are also applicable to water bodies based on the designated beneficial uses. The Trash TMDL final WQBELs are effective March 20, 2020. The effective date of the polychlorinated biphenyl (PCB) and dichlorodiphenyltrichloroethane (DDT) final WQBELs will be specified later in this document, since the USEPA-developed TMDL lacks a compliance schedule. The Bacteria TMDL final WQBELs and RWLs are currently effective for both dry weather and wet weather[1].

Table 2-4
Final Permit RWLs and WQBELs for SMB TMDLs

Reference	Parameter	Effluent Limitation/ Receiving Water Limitation
SMB Nearshore Debris TMDL	Trash – WQBEL	Zero
	Plastic Pellets – WQBEL	Zero
TMDL for PCBs/DDTs (for LA County MS4)	DDT – WLA	27.08 g/yr (based on 3-year averaging period)[2]
	PCBs – WLA	140.25 g/yr (based on 3-year averaging period)[2]
SMB Beaches Bacteria TMDL	Total coliform (daily maximum) – WQBEL	10,000 Most Probable Number (MPN)/100 mL
	Total coliform (daily maximum), if the ratio of fecal-to-total coliform exceeds 0.1 – WQBEL	1,000 MPN/100 mL
	Fecal coliform (daily maximum) – WQBEL	400 MPN/100 mL
	Enterococcus (daily maximum) – WQBEL	104 MPN/100 mL
	Total coliform (geometric mean[1]) – WQBEL/RWL	1,000 MPN/100 mL
	Fecal coliform (geometric mean[1]) – WQBEL/RWL	200 MPN/100 mL
	Enterococcus (geometric mean[1]) – WQBEL/RWL	35 MPN/100 mL

[1]The rolling 30-day geometric mean is calculated based on the previous 30 days. The reopened 2012 TMDL, which has not yet been approved by USEPA, modified this to weekly calculation of a rolling six-week geometric mean using five or more samples, starting all calculation weeks on Sunday.
[2]Group load-based WQBELs that apply to all SMB MS4 dischargers; the individual load-based WQBELs for SMB JG7 WMP Group members would be an area-weighted fraction of this.
MPN/ml = most probable number of organisms per milliliter

Grouped RWLs for the Santa Monica Bay Beaches Bacteria TMDL are also expressed in the Permit in terms of allowable exceedance days (AEDs), which vary by season and by Coordinated Shoreline Monitoring Plan (CSMP) monitoring station. AEDs applicable to SMB 7-6 and 7-8 are summarized and discussed in **Table 2-6**, presented in the following Section 2.1.4.

[1] Per Resolution 2006-008, the J7 agencies elected to pursue a non-integrated water resources approach to SMB Beaches Bacteria TMDL compliance, which results in a final wet weather compliance deadline of at most 10 years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

2.1.2 QA/QC Criteria

Quality assurance/quality control (QA/QC) criteria have been established to verify that data referenced in this water body characterization are qualified for use. All data used have either been peer reviewed; were submitted as part of an official record, such as in an agency's Annual Report to the Regional Board; or have met QA/QC criteria established by another party, such as the County, City Environmental Health Division, Regional Board, or California Environmental Data Exchange Network (CEDEN), which includes the Bight Program. Data not meeting these criteria have not been used in this water body characterization.

2.1.3 Detailed Data Analysis

A detailed monitoring data analysis was conducted to:

1. Evaluate the status of TMDL compliance;
2. Evaluate the status of 303(d) listings (i.e., whether any WBPCs meet the SWRCB's 303[d] delisting criteria);
3. Identify other WBPCs that meet 303(d) listing criteria; and
4. Identify remaining WBPCs demonstrating exceedance(s) of applicable receiving water limitations.

Monitoring data analyzed are summarized in **Table 2-5**, and existing monitoring stations are shown in **Figure 2-1**. It should be noted that the data presented are receiving water quality data and do not imply MS4 contributions.

Table 2-5
Existing Monitoring Programs

Program Name	Monitoring Period	Monitoring Locations	Parameters Analyzed	Frequency
Coordinated Shoreline Monitoring Program	2004-2013	Santa Monica Bay Beaches	Bacteria	Varies by site, weekly or daily
Southern California Bight Regional Monitoring	1994 - 2013	Santa Monica Bay Offshore/Nearshore	General suite in 1995 and 1998; PCBs and DDTs in 2003 and 2008	Varies by site

2.1.4 TMDL Compliance Status

Table 2-6 summarizes the shoreline monitoring bacteria data for 2003 through 2013 with respect to the number of exceedance days (EDs) at SMB-7-06 and SMB-7-08, as defined in the TMDL (exceeding one of four single sample daily maximum REC-1 WQOs). Both sites are open beach locations, and as such, any exceedance is not necessarily directly attributable to the MS4. Compliance at SMB-7-07 is not reported here because it was destroyed in a landslide in 2009 and is neither accessible nor monitored. Geometric mean exceedance days are not reported here. A summary of the average, median, minimum, and maximum water quality results from sampling at SMB 7-06 and SMB 7-08 is included in Attachment A. If follow-up samples were collected for weekly sites then those were included in this analysis, which may increase the number of reported EDs. As shown in **Table 2-6**, the summer dry weather AEDs have been exceeded eight out of the eleven years (73%) and three out of the eleven years (27%) between 2003 and 2013 for stations SMB-7-6 and SMB-7-8, respectively. The winter dry weather AEDs have been exceeded six out of the eleven years (55%) and one out of the eleven years (9%) between 2003 and 2013 for stations SMB-7-6 and SMB-7-8, respectively. The wet weather AEDs have been exceeded four out of the eleven years (36%) and two out of the eleven years (18%) between 2003 and 2013 for stations SMB-7-6 and SMB-7-8, respectively. It should be noted that 2005 recorded the most annual rainfall in Los Angeles County history (34 inches), which likely contributed to the abnormal number of exceedances.

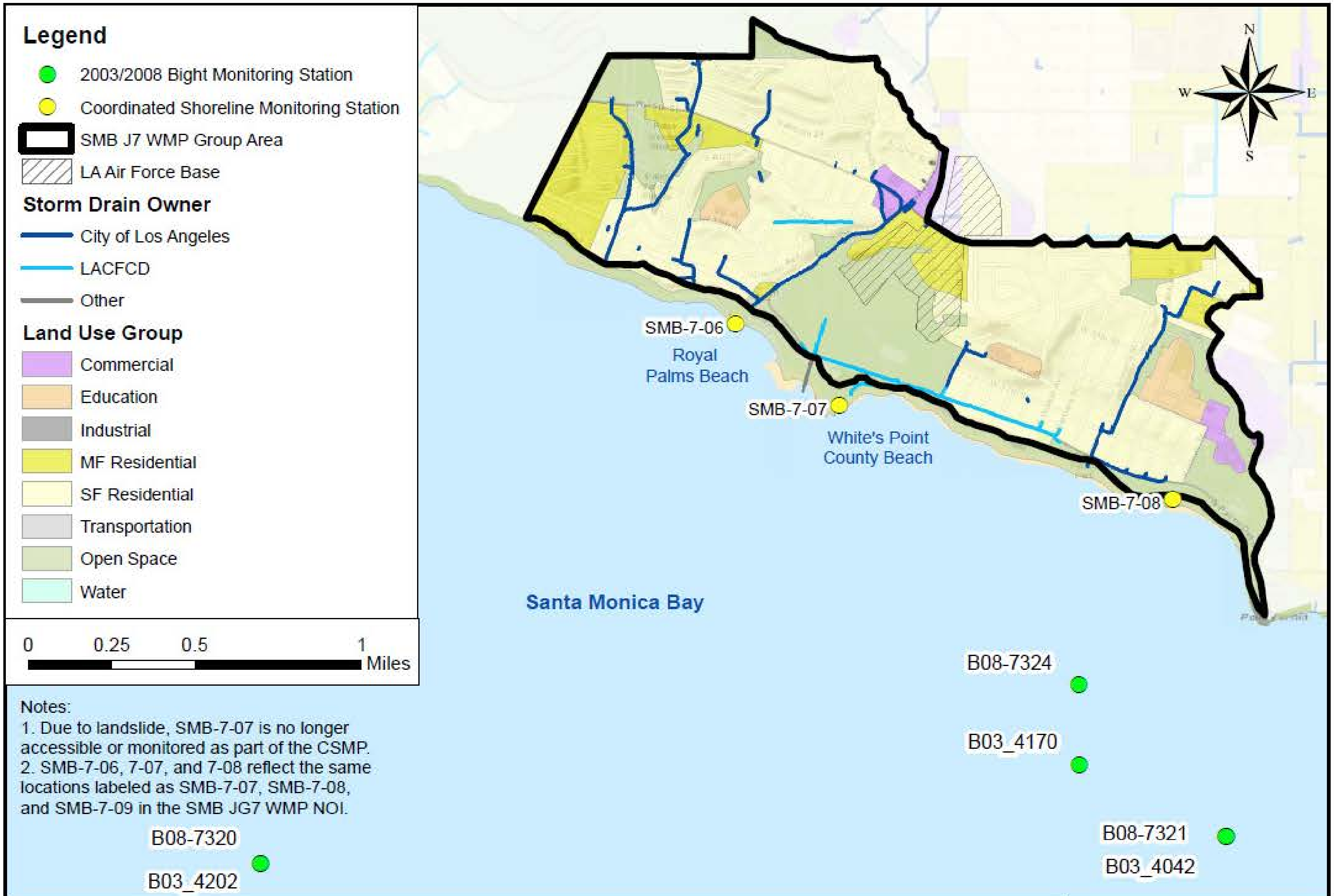


Figure 2-1
Existing Monitoring Stations
SMB JG7 WMP

June 2014

Table 2-6
Summary of Exceedance Days
(bold text signifies Exceedance Days > Allowable Exceedance Days)

Station (type)	Season	AEDs	Number of Exceedance Days per TMDL Year										
			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SMB-7-6 (open beach)	Dry-Summer[a]	0	**1**	**1**	**1**	**2**	0	**2**	0	**1**	0	**1**	**1**
	Dry-Winter[b]	1	**3**	1	**11**	1	**2**	0	**5**	1	**2**	**2**	0
	Wet[c]	1[d]	1	1	**28**	1	0	**2**	1	**3**	**2**	1	0
SMB-7-8 (open beach)	Dry-Summer[a]	0	**1**	**1**	0	0	0	0	0	0	0	**3**	0
	Dry-Winter[b]	1	0	0	**2**	0	0	0	1	0	1	0	0
	Wet[c]	1[d]	0	0	**13**	0	0	0	1	0	**2**	1	0

[a] Summer Dry Weather = April 1 – October 31
[b] Winter Dry Weather = November 1 – March 31
[c] Wet Weather = November 1 – October 31, days with >=0.1 inches of rain and the three days following
[c] 2012-2013 dataset is incomplete and ends on 9/18/2013.
[d] AEDs are based on weekly sampling. Exceedance days were calculated based on the raw data. For example, in cases where more than one sample was collected in a single week, those results were still compared against the weekly AEDs. This approach is consistent with annual monitoring reports, but overestimates actual exceedance weeks.

2.1.5 Other Water Body-Pollutant Combinations that meet 303(d) Listing Criteria

There were no WBPCs identified within the SMB JG7 WMP geographical scope that were found to meet the 303(d) listing criteria.

2.1.6 Remaining Water Body-Pollutant Combinations Demonstrating Exceedance(s) of Applicable Receiving Water Limitations

Water quality data were compared to WQBELs and/or water quality objectives to determine if exceedances occurred within the last five (5) years. Those constituents that either had no exceedances within the past five (5) years, or did not meet the 303(d) listing criteria for impairment, are discussed below but will not be considered in the prioritization process at this time.

USEPA's Santa Monica Bay DDTs and PCBs TMDL (USEPA, 2012) relies on a limited dataset to establish stormwater load allocations, relying on a single study (Curren *et al*, 2011) from a single creek (Ballona Creek, which is outside the SMB JG7 WMP area) to extrapolate MS4 wasteload allocations to other SMB watersheds based on percent urban area. The Santa Monica Canyon, Ballona Creek, and Hermosa Beach watersheds combined represent 94% of the developed area draining to Santa Monica Bay. The TMDL does not present sufficient data to assign MS4 contributions to the DDT and PCB concentrations observed in Santa Monica Bay.

The Bight Regional Monitoring program includes six[2] offshore sampling locations within the SMB JG7 WMP geographical scope that were sampled between 1994 and 2008. Two sites (1267_SCBPP and B98_2389) were only sampled in 1994 and 1998, respectively, which is outside the range of recent data (10 years). The other sampling locations include sediment-based data from 2003 and 2008. The only TMDL sediment-based targets applicable to the SMB JG7 WMP area are for DDTs and PCBs; therefore, DDTs and PCBs are the only analytes included in this analysis. The sampling sites containing these data from 2003 and 2008 were located between 0.5 and 2 miles off the coastline of the SMB JG7 WMP Area. **Table 2-7** summarizes the results from these sampling sites.

[2] There are eight station IDs; however, two of the locations include one Station ID from 2003 and one from 2008. Therefore, these four Station IDs represent two sampling locations, resulting in a total of six sampling locations during the entire monitoring period.

Table 2-7
Bight '03 and '08 PCB and DDT Monitoring Results[a]

Station ID	Station Description	Date	PCB[b] (ug/kg OC)	DDT[b] (ug/kg OC)
B08-7324	Approximately 0.5 miles off the coast of Point Fermin Park Beach	7/24/2008	103	**3,865**
B03-4042/ B08-7321	Approximately 0.6 miles off the coast of Point Fermin Park Beach	8/19/2003	**5,318**	**60,400**
		7/24/2008	**2,923**	**5,171**
B03-4170	Approximately 0.75 miles off the coast of Point Fermin Park Beach	8/21/2003	**1,051**	**22,984**
B03-4202/ B08-7320	Approximately 2 miles off the coast of White's Point Beach	8/20/2003	**9,419**	**111,497**
		7/24/2008	**19,420**	**125,515**

[a] Bold text signifies an exceedance of the sediment targets (normalized to total organic carbon) set forth in the PCBs and DDT TMDL for Santa Monica Bay. These established targets are 2,300 ug/kg OC for total DDT and 700 ug/kg OC for total PCBs.
[b] These are estimated values that assume one half of the method detection limit for all non-detect results.

Since the Bight samples were collected 0.5 to 2 miles off the coast away from any MS4 outfalls, this does not represent sufficient evidence to establish potential linkage of MS4 discharges to observed sediment concentrations.

2.2 Water Body-Pollutant Prioritization

Based on the water quality characterization, the WBPCs identified in **Table 2-8** have been classified into one of three categories, in accordance with Section IV.C.5(a)ii of the Permit. This categorization is intended to prioritize WBPCs in order to guide the implementation of structural and institutional BMPs.

Table 2-8
Water Body Pollutant Prioritization
(Listed in order of compliance deadline, interim and final are included, passed deadlines are shown in bold font)

Category	Water Body	Pollutant	Compliance Deadline
1	SMB Beaches	Summer dry weather bacteria	**7/15/2006 for single sample AEDs**
		Winter dry weather bacteria	**7/15/2009 for single sample AEDs**
		Wet weather bacteria	**7/15/2013 for single sample AEDs**[1]
			7/15/2013 for geometric mean (GM)[1]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][2]
		PCBs	[No compliance deadline specified in TMDL][2]
2	No Category 2 WBPCs have been identified at this time		
3	No Category 3 WBPCs have been identified at this time		

[1] Per Resolution 2006-008, the J7 agencies elected to pursue a non-integrated water resources approach to SMB Beaches Bacteria TMDL compliance, which results in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

[2] Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, the WLA target was set at existing waste load, so antidegradation conditions exist.

As part of the adaptive management process, categorization of future WBPCs may be adjusted based on data obtained from monitoring, source evaluations, and BMP implementation. Data collected as part of the approved CIMP may result in future Category 3 designations in instances when receiving water limits are exceeded and MS4 discharges are identified as contributing to such exceedances. Under these conditions, the appropriate agencies will adhere to Section VI.C.2.a.iii of the Permit.

2.2.1 Category 1 – Highest Priority

WBPCs under Category 1 (highest priority) are defined in the Permit as *"water body-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R [of the Permit]."*

The WMPC of bacteria (wet and dry weather) at the Santa Monica Bay Beaches within the SMB JG7 WMP area (including Royal Palms Beach, White Point Beach, and Point Fermin Park Beach) fall within Category 1 because they are listed in the Santa Monica Bay Beaches Bacteria TMDL.

Similarly, a Debris TMDL exists for Santa Monica Bay. Section VI.E.5.b(i) of the Permit states, *"Pursuant to California Water Code section 13360(a), Permittees may comply with the trash [debris] effluent limitations using any lawful means. Such compliance options are broadly classified as full capture, partial capture, institutional controls, or minimum frequency of assessment and collection… and any combination of these may be employed to achieve compliance."* While trash will not be modeled as part of the RAA, the RAA will address how the JG7 agencies will comply with the TMDL WQBELs by providing details on the planned implementation of the methods listed above, primarily through their Trash Monitoring and Reporting Program.

Although a USEPA TMDL exists for DDTs and PCBs for Santa Monica Bay, the TMDL relies on a limited dataset outside of the JG7 watershed area to establish stormwater load allocations. The TMDL mass-based waste load allocations for DDTs and PCBs are equivalent to the estimated existing stormwater loads (i.e., based on data used in the TMDL, zero MS4 load reduction is required). As a result, it is anticipated that for the WMP RAA, no reductions in DDT and PCB loading from the JG7 MS4s are required to meet the TMDL WQBELs. And while DDTs and PCBs cannot be modeled as a stormwater pollutant for the RAA (due to the lack of land use event mean concentrations and BMP performance data), it will be qualitatively evaluated. It is also noted that the implementation of future institutional and/or structural BMPs throughout the SMB JG7 WMP area will lead to a reduction in runoff volume and suspended sediment loading from the MS4s, thereby further reducing the existing mass load of any sediment-bound DDTs and/or PCBs to the Santa Monica Bay. For these reasons, while DDT and PCBs will be included as Category 1 pollutants, they will be prioritized lower than bacteria and debris within Category 1, and will continue to be evaluated further through the CIMP monitoring effort.

2.2.2 Category 2 – High Priority

Category 2 (high priority) WBPCs are defined as *"pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment."*

There are no WBPCs within the SMB JG7 WMP area that currently qualify as Category 2.

2.2.3 Category 3 – Medium Priority

Category 3 (medium priority) designations are to be applied to WBPCs that are not 303(d)-listed but which exceed applicable receiving water limitations contained in the Permit and for which MS4 discharges may be causing or contributing to the exceedance.

There are no WBPCs within the SMB JG7 WMP area that currently qualify as Category 3.

2.3 Source Assessment

The following data sources have been reviewed as part of the source assessment for bacteria and DDT/PCBs in the Santa Monica Bay subwatersheds:

- Findings from the Permittees' Illicit Connections and Illicit Discharge (IC/ID) Elimination Programs;
- Findings from the Permittees' Industrial/Commercial Facilities Programs;
- Findings from the Permittees' Development Construction Programs;
- Findings from the Permittees' Public Agency Activities Programs;
- TMDL source investigations;
- Watershed model results;
- Findings from the Permittees' monitoring programs, including but not limited to TMDL compliance monitoring and receiving water monitoring; and
- Any other pertinent data, information, or studies related to pollutant sources and conditions that that contribute to the highest water quality priorities.

Since the only receiving water in the SMB JG7 WMP area is the Santa Monica Bay, the following source assessment is broken down by pollutant.

2.3.1 Indicator Bacteria

Wet weather runoff event mean concentrations (EMCs) for fecal coliform, based on the Southern California Coastal Water Research Project (SCCWRP) land use data for the Los Angeles region (Stein *et al*, 2007), indicate that the highest concentrations are expected from agricultural land uses (there are none in the SMB JG7 WMP area), followed by commercial and educational, single family residential, multi-family residential, open space, industrial, and transportation. The SCCWRP study also found that in some cases the levels of fecal indicator bacteria at the recreational (horse) and agricultural land use sites were as high as those found in primary wastewater effluent in the United States. Tiefenthaler *et al* (2011) also found that horse stable sites contributed to significantly higher wet weather EMCs than other land use types.

The Santa Monica Bay Beaches Bacteria TMDL for both dry and wet weather was the first bacteria TMDL adopted by the Regional Board in the State of California. The Santa Monica Bay Beaches Bacteria TMDL was recently opened for reconsideration, although the source assessment was not part of this update. As a result, the general findings from the original source assessment remain unchanged. These findings are summarized in the 2012 Basin Plan Amendment for the reopened Santa Monica Bay Beaches Bacteria TMDL (Attachment A to Resolution No. R12-007):

> *"With the exception of isolated sewage spills, dry weather urban runoff and stormwater runoff conveyed by storm drains and creeks is the primary source of elevated bacterial indicator densities to beaches. Limited natural runoff and groundwater may also potentially contribute to elevated bacterial indicator densities during winter dry weather"* (Regional Board, 2012).

The Santa Monica Bay Beaches Bacteria TMDL source assessment maintains that dry weather urban runoff and stormwater runoff is the primary source of elevated bacteria concentrations at Santa Monica Bay beaches. Although definitive information regarding the specific sources of bacteria within the watershed is not presented, speculation provided in the dry weather staff report provides some insight into possible sources:

> *"Urban runoff from the storm drain system may have elevated levels of bacterial indicators due to sanitary sewer leaks and spills, illicit connections of sanitary lines to the storm drain system, runoff from homeless encampments, illegal discharges from recreational vehicle holding tanks, and malfunctioning septic tanks among other things. Swimmers can also be a direct source of bacteria to recreational waters. The bacteria indicators used to assess water quality are not specific to human sewage; therefore, fecal matter from animals and birds can also be a source of elevated levels of bacteria, and vegetation and food waste can be a source of elevated levels of total coliform bacteria, specifically"* (Regional Board, 2002).

The 2010-2011 and 2011-2012 Los Angeles County Municipal Stormwater Permit Individual Reports[3] for the JG7 agencies report that both sanitary sewer overflows and IC/ID, while eliminated shortly after being reported, do sometimes occur in their jurisdiction (but not necessarily within the SMB JG7 WMP area).

Additionally, information on non-MS4 sources of surfzone bacteria were compiled and based on a comprehensive review of Southern California published literature, as part of comments on the reopened Bacteria TMDL (City of Malibu, 2012):

> *"A number of recent Santa Monica Bay studies have further identified and confirmed natural (non-anthropogenic) sources of fecal indicator bacteria (FIB) including plants, algae, decaying organic matter, beach wrack and bird feces – implicating these as potentially significant contributors to exceedances (Imamura et al, 2011; Izbicki et al, 2012). Beach sands, sediments*

[3] The available Annual Reports were reviewed for 2010-2011 and 2011-2012.

and beach wrack have been shown to be capable of serving as reservoirs of FIB, possibly by providing shelter from ultra violet (UV) inactivation and predation by allowing for regrowth (Imamura et al, 2011;, Izbicki et al, 2012; Lee et al, 2006; Ferguson et al, 2005; Grant et al, 2001; Griffith, 2012; Litton et al, 2010; Phillips et al, 2011; Jiang et al, 2004; Sabino et al, 2011; and Weston Solutions, 2010). In fact, enterococci include non-fecal or "natural" strains that live and grow in water, soil, plants and insects (Griffith, 2012). Thus, elevated levels of enterococci in water could be related to input from natural sources. The phenomenon of regrowth of FIB from either anthropogenic or natural sources has been suggested by several studies as a possible source of beach bacteria exceedances (Griffith, 2012; Litton et al, 2010; Weston Solutions, 2010; Izbicki et al, 2012; Weisberg et al, 2009)."

Other sources of bacteria during wet weather are anticipated to include other non-MS4 permitted stormwater discharges such as Industrial General Permit sites, Construction General Permit sites, Phase II MS4 Sites (e.g., college campuses), State/Federal owned lands, non-MS4 open space areas such as wildlife habitat, and the California Department of Transportation (Caltrans).

2.3.2 DDT and PCBs

As stated previously, limited data are available to characterize DDT and PCBs within Santa Monica Bay, particularly since direct discharges of these pollutants from publically-owned treatment works (POTWs) have ceased. The largest concentration of DDT and PCBs within Santa Monica Bay is contained within the Palos Verdes shelf, which is being addressed by the USEPA as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site. Loadings from the shelf to the Bay are large and have been well characterized (USEPA, 2012).

With respect to stormwater, the TMDL does not specifically characterize MS4 loadings, though it does recognize that *"DDT and PCBs are no longer detected in routine stormwater sampling from Ballona Creek or Malibu Creek."* However, the TMDL also states that current detection limits used to analyze DDT and PCB concentrations are too high to appropriately assess the water quality.

No other data or source information is available at this time. Once three years of water quality data are collected from Ballona Creek and Santa Monica Canyon Channel and evaluated consistent with the recommendations by USEPA in the TMDL to utilize a three-year averaging period[4], then further source assessment will be considered and the categorization and prioritization of PCB and DDTs as MS4-related pollutants of concern will be reevaluated.

[4] The three-year averaging period is recommended by the USEPA TMDL in Section 8.2, which reads, *"We recommend that stormwater waste load allocations be evaluated based on a three year averaging period"* (USEPA, 2012). Additionally, Permit Attachment M states that compliance with the PCB and DDT waste load allocations shall be determined based on a three-year averaging period.

3
Watershed Control Measures

The Permit specifies that control measures, also referred to as BMPs, shall be identified to ensure that stormwater discharges meet RWLs and WQBELs as established in the Permit and to reduce overall impacts to receiving waters from stormwater and non-stormwater runoff.

BMPs are typically grouped into two broad categories, structural and institutional. Structural BMPs are physically-constructed control measures that alter the hydrology or water quality of stormwater or non-stormwater within the MS4 and are designated as either centralized or distributed based on their location within a watershed and size of contributing drainage area. Institutional BMPs are source control measures that prevent the release of flow/pollutants or transport of pollutants within the MS4 area, but do not involve construction of physical facilities. Minimum control measures (MCMs) are a subset of institutional BMPs.

Due to the zero required load reductions and the SMB JG7 WMP geography (outfalls are located on unstable cliffs and there are landslide and liquefaction hazards throughout the SMB JG7 WMP area), there are currently no centralized or distributed BMPs planned in the SMB JG7 WMP area at this time. In the event that CIMP monitoring demonstrates a need for quantitative RAA modeling and BMP implementation, BMPs may be selected based on performance data, subsurface conditions, land uses within the contributing drainage areas, and other relevant characteristics.

3.1 Minimum Control Measures/Institutional BMPs

The Permit requires the implementation of MCMs in Parts VI.D.4 through VI.D.10. These MCMs are similar to the programs required under the previous MS4 Permit (Order No. 01-182).

Although the previous MS4 Permit required implementation of MCMs, some of the key modifications introduced by the current MS4 Permit related to MCMs include:

- The Permit calls for more outreach and education as part of the Public Information and Participation Program (PIPP). Permittees, for example, will be required to maintain a website with stormwater-related educational materials.
- Permittees are expected to record additional information on industrial and commercial facilities within their jurisdiction as part of their Industrial/Commercial Facilities Program. For example, industrial/commercial facilities records will need to list receiving waters for which each respective facility is tributary to.
- The Permit provides more detailed criteria on BMP sizing and specification for use in the Permittees' Planning and Land Development Program, formerly the Development Planning Program, and calls for annual reporting of implemented mitigation projects.
- An Erosion and Sediment Control Plan (ESCP), which includes elements of a Storm Water Pollution Prevention Plan (SWPPP), replaces the Local SWPPP (L-SWPPP) as a required document for construction activities meeting certain criteria as a prerequisite to building/grading permit issuance.
- The Permit also requires Permittees to use an electronic tracking system to track construction activities within their jurisdiction and mandates slightly more aggressive inspection schedules.
- The Public Agency Activities Program remains largely unchanged with the exception of requiring Permittees to inventory existing developments for BMP retrofitting opportunities.

A comprehensive comparison between program requirements of the previous and current MS4 Permits is summarized in **Table 3-1**. Permittee activities under the Storm Water Management Program are summarized in the Los Angeles County Unified Annual Stormwater Reports; the report for the most recent reporting year is available at http://ladpw.org/wmd/npdesrsa/annualreport/index.cfm (Los Angeles County Department of Public Works, 2012).

As required by the Permit, the agencies in the SMB JG7 WMP group are continuing to implement the MCMs required under the 2001 MS4 Permit until the WMP is approved by the Regional Board. Applicable new MCMs will be implemented by the time the WMP is approved by the Regional Board. A brief description of each Program MCM and the tasks associated with each are summarized next. The implementation summaries of the Program MCM tasks identified are available in the Unified Annual Stormwater Report published by the Los Angeles County Department of Public Works.

The agencies in the SMB JG7 WMP group have also developed mechanisms for tracking information related to new development/re-development projects that are subject to post-construction BMP requirements in Part VI.D.7 of the MS4 Permit.

Table 3-1
Comparison of Stormwater Management Program MCMs

Program Element	Activity	Previous Permit (Order No. 01-182)	Current Permit (Order No. R4-2012-0175)
Public Information and Participation Program	Public Education Program - advisory committee meeting (once per year)	X	
	"No Dumping" message on storm drain inlets (by 2/2/2004)	X	
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	X	X
	Outreach and education	X	X
	Make reporting info available to public	X	X
	Public service announcements, advertising, and media relations	X	X
	Public education materials - proper handling	X	X
	Public education materials - activity specific	X	X
	Educational activities and countywide events	X	X
	Quarterly public outreach strategy meetings (by 5/1/2002)	X	
	Constituent-specific outreach information made available to public	X	X
	Business Assistance Program	X	
	Educate and inform corporate managers about stormwater regulations	X	
	Maintain storm water websites		X
	Provide education materials to schools (50 percent of all K-12 children every two years)	X	X
	Provide principle permittee with contact information for staff responsible for storm water public educational activities (by 4/1/2002)	X	X
	Principal permittee shall develop a strategy to measure the effectiveness of in-school education programs	X	
	Principle permittee shall develop a behavioral change assessment strategy (by 5/1/2002)	X	
	Educate and involve ethnic communities and businesses (by 2/3/2003)	X	X
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	X	X
Industrial/Commercial Facilities Program Industrial/Commercial Facilities Program	Track critical sources – Restaurants	X	X
	Track critical sources - Automotive service facilities	X	X
	Track critical sources – RGOs	X	X
	Track critical sources - Nurseries and nursery centers		X
	Track critical sources – USEPA Phase I facilities	X	X
	Track critical sources - Other federally-mandated facilities [40 Code of Federal Regulations (CFR) 122.26(d)(2)(iv)(C)]	X	X
	Track critical sources - Other commercial/industrial facilities that Permittee determines may contribute substantial constituent load to MS4		X
	Facility information - Name of facility	X	X
	Facility information - Contact information of owner/operator	Name only	X
	Facility information - Address	X	X
	Facility information – North American Industry Classification System (NAICS) code		X
	Facility information – Standard Industrial Classification (SIC) code	X	X
	Facility information - Narrative description of the activities performed and/or principal products produced	X	X
	Facility information - Status of exposure of materials to storm water		X
	Facility information - Name of receiving water		X
	Facility information - ID whether tributary to 303(d) listed water and generates constituents for which water is impaired		X
	Facility information - NPDES/general industrial permit status	X	X
	Facility information - No Exposure Certification status		X
	Update inventory of critical sources annually	X	X
	Business Assistance Program	Optional	X
	Notify inventoried industrial/commercial sites on BMP requirement		Once in 5 years
	Inspect critical commercial sources (restaurants, automotive service facilities, retail gasoline outlets and automotive dealerships)	Twice in 5 years	Twice in 5 years
	Inspect critical industrial sources (phase 1 facilities and federally-mandated facilities)	Twice in 5 years[1]	Twice in 5 years[2]
	Verify No Exposure Certifications of applicable facilities		X
	Verify Waste Discharge Identification (WDID) Number of applicable facilities	X	X
	Source control BMPs	X	X
	Provisions for Significant Ecological Areas (SEAs) (Environmentally Sensitive Areas (ESAs)	X[3]	X
	Progressive enforcement of compliance with stormwater requirements	X	X
	Interagency coordination	X	
Planning and Land Development Program	Peak flow control (post-development stormwater runoff rates, velocities, and duration)	X	X[4]
	Hydromodification Control Plan	In lieu of countywide peak flow control	
	SUSMP (by 3/3/03)	X	
	Volumetric treatment control (SWQDv) BMPs	X	X
	Flow-based treatment control BMPs	X	X
	Require implementation of post-construction Planning Priority Projects as treatment controls to mitigate storm water pollution (by 3/10/2003)	X	X
	Require verification of maintenance provisions for BMPs	X	X
	California Environmental Quality Act process update to include consideration of potential stormwater quality impacts	X	
	General Plan update to include stormwater quality and quantity management considerations and policies	X	
	Targeted employee training of development planning employees	X	
	Bioretention and biofiltration systems		X
	SUSMP guidance document	X	
	Annual reporting of mitigation project descriptions		X
Development Construction Program	Erosion control BMPs	X	X
	Sediment control BMPs	X	X
	Non-storm water containment on project site	X	X
	Waste containment on project site	X	X
	Require preparation of a Local SWPPP for approval of permitted sites	X	X
	Inspect construction sites on as-needed basis		X
	Inspect construction sites equal to or greater than one acre	Once during wet	Once every two

RB-AR16667

Program Element	Activity	Previous Permit (Order No. 01-182)	Current Permit (Order No. R4-2012-0175)
		season	weeks[5], monthly
	Electronic tracking system (database and/or Geographic Information System)		X
	Required documents prior to issuance of building/grading permit	L-SWPPP	ESCP/SWPPP
	Implement technical BMP standards		X
	Progressive enforcement	X	X
	Permittee staff training	X	X
Public Agency Activities Program	Public construction activities management	X	X
	Public facility inventory		X
	Inventory of existing development for retrofitting opportunities		X
	Public facility and activity management	X	X
	Vehicle maintenance, material storage facilities, corporation yard management	X	X
	Landscape, park, and recreational facilities management	X	X
	Storm drain operation and maintenance	X	X
	Streets, roads, and parking facilities maintenance	X	X
	Parking facilities management	X	X
	Emergency procedures	X	X
	Alternative treatment control BMPs feasibility study	X	
	Municipal employee and contractor training		X
	Sewage system maintenance, overflow, and spill prevention	X	
Illicit Connection/Illicit Discharge (IC/ID) Elimination Program	Implementation program	X	X
	MS4 Tracking (mapping) of permitted connections and illicit connections and discharges	X	X
	Procedures for conducting source investigations for IC/IDs	X	X
	Procedures for eliminating IC/IDs	X	X
	Procedures for public reporting of ID		X
	IC/ID response plan	X	X
	IC/IDs education and training for staff	X	X

[1] Tier 2 facilities may be inspected less frequently if they meet certain criteria
[2] Subject to change based on approved JG7 WMP strategy
[3] For environmentally sensitive areas and impaired waters
[4] Maintain pre-project runoff flow rates via hydrologic control measures
[5] Sites of threat to water quality or discharging to impaired water; frequency dependent on chance of rainfall

3.1.1 Customization of MCMs

In lieu of the requirements of Parts VI.D.4 through VI.D.10 of the Permit, the SMB JG7 WMP Group may customize MCMs within each of the general categories. The motivation for considering customization is made more apparent in the Regional Board's response to a comment that the Permit should establish criteria that will be used to support any customization of MCMs; the Regional Board responded with the following:

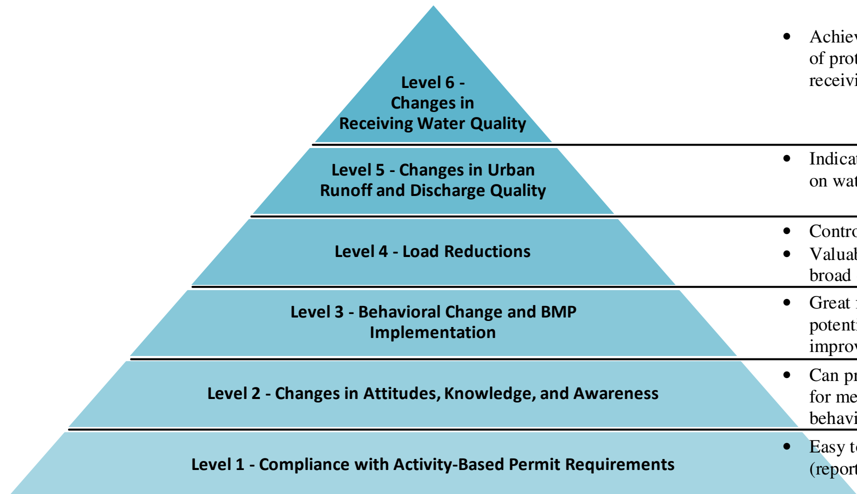
> *The Order specifies that at a minimum, Permittees' programs shall be consistent with 40 CFR section 122.26(d)(2)(iv)(A)-(D). In response to comments that the Order is overly prescriptive, specifying criteria could restrict customization within these categories of minimum control measures. The criterion to allow customization is based on showing equivalent effectiveness, for example, a municipality who has identified a group of facilities within their jurisdiction as the largest source of constituents could be allowed to focus their inspection efforts on controlling the constituents from this subset of facilities.*
> (http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/StormSewer/CommentLetters/E_MCM%20Matrix%2010-26-12%20Final.pdf)

The opportunity for customization may provide benefit by allowing the SMB JG7 WMP Group to assess the effectiveness of their current programs and to modify their programs to better serve local conditions and objectives. If an effectiveness assessment is conducted on a specific MCM activity and it can be reasonably shown that customization of the MCM would result in equal or improved effectiveness on attitudes or knowledge, behavior or implementation, load reduction, or water quality, then a defensible recommendation for modification of that activity can be made, resulting in greater resources available for more effective activities.

The SMB JG7 WMP Group is not planning to customize MCM activities at this time. However, in the event that MCM customization would be beneficial to the identified WBPCs or if CIMP results indicate adjustments would be beneficial and/or needed, the first step in customizing MCM activities would be the development of a framework to assess the effectiveness of each MCM in its current implementation. For each MCM that can be assessed in this manner, recommendations for customizations can be developed with reasonable assurance of impact to effectiveness.

The California Stormwater Quality Association (CASQA) provides such a framework for the effectiveness assessment of Stormwater Management Programs (CASQA, 2006). The outcome is a hierarchy that categorizes the classification of outcome types (levels) that will allow MCMs to be placed into one or more categories for subsequent outcome assessment. The outcome levels, Level 1 through Level 6, are summarized in **Figure 3-1**.

Figure 3-1
General Classification of Outcome types (adapted from CASQA)



Benefits	Limitations
• Achieves ultimate goal of protection of receiving water	• Very difficult to determine for specific MCMs • Sees influence from non-MS4 sources
• Indicates direct impact on water quality	• Requires substantial monitoring
• Controls the source • Valuable for making broad comparisons	• Requires development of a baseline to estimate
• Great first indicator of potential water quality improvement	• Requires observation and inspection
• Can provide the basis for measuring behavioral change	• Many different factors influence levels of public involvement
• Easy to determine (reporting)	Does not indicate direct impacts

3.1.2 MCMs and Outcome Levels

The outcome types in this effectiveness assessment framework are interrelated. The Permit's stormwater management program is, by design, intended to improve the water quality in receiving waters. The means by which this goal is intended to be met is through the implementation of compliance measures by the SMB JG7 WMP Group. Compliance with these activity-based measures results in Level 1 outcomes. Assessments of these activities can provide further understanding of the outcomes they have. Ideally, each activity will contribute to the improvement at the Level 6 receiving water quality level; however, tracking effectiveness at this level is difficult.

A summary of the MCM activities of the agencies within the SMB JG7 WMP Group is included in the 2011-12 Annual Stormwater Report (Los Angeles County Department of Public Works, 2012). In addition to the standard reporting, the agencies answered a list of questions in an Assessment of Program Effectiveness. This summary largely includes responses that may be considered as Level 1 outcomes (compliance) with Level 2, Level 3, and Level 4 outcomes for select MCMs. Several obstacles inhibit the ability to achieve a Level 5 or Level 6 assessment, including:

- Available budget;
- Lack of comprehensive monitoring;
- Timing of MCM activities and corresponding runoff events; and/or
- General complexity of the hydrology and conveyance.

All SMB JG7 WMP Group members were in compliance with the Permit during the 2011-12 reporting year (Level 1 outcome). **Table 3-2** summarizes effectiveness assessment metrics and potential outcomes associated with select MCMs within each Program Element of the Storm Water Management Program. The following is a brief description of the Program MCMs and outcome levels that can be achieved through the effectiveness assessment framework described.

3.1.2.1 Public Information and Participation Program

The PIPP is intended primarily to reach out and educate the general public, students, business owners, facility operators, city staff, and others on stormwater. This outreach is accomplished in many ways; examples include "No Dumping" messages on storm drain inlets; public education materials; information

websites; community events; reporting hotlines; and specialized awareness programs, such as the used oil program. The program elements are intended to directly impact awareness and the behavior of different target audiences (Level 2 and Level 3 outcomes). Consequently, these behavioral changes may impact constituent loads to the MS4 indirectly, but the actual Level 4 through Level 6 impact of a specific MCM in this category may be difficult to quantify.

3.1.2.2 Industrial/Commercial Facilities Program

Permittees are required to conduct an Industrial/Commercial Facilities Program designed to prevent illicit discharges, reduce discharges of stormwater, and prevent industrial/commercial discharges to the MS4 from causing or contributing to receiving water quality exceedances. These facilities are tracked and inspected to ensure use of BMPs to control stormwater discharges. In addition, the program aims to contribute to the education of business owners and facility operators regarding SWPPP. The effectiveness of this program can be assessed leading to insight on how awareness (Level 2) and BMP implementation (Level 3) are affected.

3.1.2.3 Planning and Land Development Program

The Planning and Land Development Program involves developers early in the land development stage, with the integration of BMPs and Low Impact Development (LID) controls to reduce constituent loading to the MS4 and minimize runoff intensity generated from impervious areas. Behavioral change (Level 3) can be assessed through permitting staff observations. Also, it may be possible to assess constituent load reductions (Level 4) through land developer BMP choices and water quality of runoff entering the MS4 (Level 5) if monitoring stations are considered during the planning stage of development and redevelopment.

3.1.2.4 Development Construction Program

Similar to the Planning and Land Development Program, the Development Construction Program establishes requirements for construction activities to eliminate illicit discharges and prevent water quality violations from stormwater discharges from the construction site. The Program establishes criteria for BMPs and controls through an Erosion and Sediment Control Plan, with elements of a SWPPP. The effectiveness of this program can be assessed through inspections to verify BMP implementation (Level 3). Level 2 awareness outcomes can be assessed through the use of a website that informs contractors on proper BMP selection and prerequisite checklists for permitting.

3.1.2.5 Public Agency Activities Program

Activities ranging from street sweeping, catch basin cleaning, public facility maintenance, and storm drain operation fall under the Public Agency Activities Program. These activities are essential MCMs that can also be measured for effectiveness. Level 3 through Level 5 outcomes (behavior, load reduction, MS4 water quality) can all be assessed through appropriate evaluation metrics. The impact to receiving water quality (Level 6) may be possible to determine if appropriate monitoring is in place, with phased implementation of MCM activities to isolate performance evaluation.

3.1.2.6 Illicit Connections and Illicit Discharges Elimination Program

IC/IDs are controlled through the IC/ID Elimination Program and by implementing a procedure for reporting, tracking, and responding to reports of IC/IDs, as well as establishing protocols for the regular inspection of storm drains. The effectiveness of the reporting procedure can be assessed on a Level 2 (awareness) basis, and response activities can have their effectiveness determined directly through monitoring of the MS4 water quality (Level 5). A quantitative analysis of behavioral change (Level 3) as a result of enforcement actions is also achievable.

3.1.3 Next Steps to MCM Customization

The assessment framework outlines the process to determine baseline MCM effectiveness, providing the foundation for customization. Pending the results of the approved CIMP, opportunities for modifying

MCM activities may be proposed by the SMB JG7 WMP Group as part of the adaptive management process.

It should be noted, however, that institutional BMPs (or MCMs) such as street and median sweeping implementations, drain inlet and conveyance system cleaning, pet waste program enhancements, etc. are anticipated to cumulatively result in a pollutant load reduction between 5% and 8%. Additionally, assuming past data also reflect future trends, it is anticipated that 0.1 – 0.2% of residential, commercial, and industrial properties will implement LID annually through development or redevelopment projects[5]. Although RWLs are currently being met, it is anticipated that implementation of LID will further enhance the water quality in this region.

[5] 0.1% annual estimate is based on a review of development/redevelopment projects within the SMB JG7 WMP Group area over the past 10 years assuming a 0.2 acre lot size. 0.2% annual estimate is based on the area-weighted projected development/redevelopment rate for residential, commercial, and industrial land uses reported by the City in the Ballona TMDL Implementation Plan.

Table 3-2
Effectiveness Assessment Measures for Various Activities under the Storm Water Management Program

Program MCM	Permittee Activity	Possible Assessment Metric	Outcome Level
Public Information and Participation Program	Advertising / media campaigns (e.g., Used Oil / Used Oil Filter Program)	Year-over-year change in no. of impressions	L2
		Survey results	L2, L3
	Educational programs (e.g., Generation Earth, Environmental Defenders, public workshops)	Year-over-year change in attendance	L2
		Quiz results	L2, L3
	E-Waste collection events	Amount of Household Hazardous Waste/E-Waste	L3, L4
	888-CLEAN-LA hotline	Change in no. of calls	L2
	www.888CleanLA.com	No. of unique visitors / document downloads	L2
Industrial/Commercial Facilities Program	Website on program details	No. of unique visitors / document downloads	L2
	Electronic tracking	Inspections: change in no. of Notices of Violation (NOV) / non-compliance	L3
Planning and Land Development Program	Pre-permitting assessment	No. of developers incorporating BMPs and LID in early-stage	L3
	Annual reporting	% of stormwater capture	L3, L4
	Integrated control measures	Measure performance through planned monitoring	L5
Development Construction Program	Website on program details	Number of hits / document downloads	L2
	Electronic tracking	Inspections: change in no. of NOV / non-compliance	L3
Public Agency Activities Program	Street sweeping	Street sweeper fleet (technology)	L3
		Year-over-year change in debris collected	L3, L4
	Catch basin cleaning	Year-over-year change in trash collected	L3, L4
	Installation of trash receptacles	Observations: cleanliness of public roadways	L3
	Sanitary sewer overflow response	Monitoring results of MS4 water quality	L5
IC/ID Elimination Program	IC/ID reporting hotline	Year-over-year change in no. of calls	L2
	Termination of IC/ID	Outfall monitoring: change in water quality	L5
	Enforcement actions	Change in occurrence	L3
Other	Support for Senate Bill (SB) 346 (Brake Pad Initiative)	% of vehicles with reduced-copper-content brake pads	L4

4
Reasonable Assurance Analysis

Typically, an important component of the WMP is the RAA. The RAA is a process that is used to demonstrate that institutional and structural control measures are expected to be sufficient for achieving applicable WQBELs and/or RWLs for the water body pollutant combinations that have compliance deadlines within the Permit term. In addition to using the RAA as a means to determine the efficacy of existing and potential control measures, the RAA also facilitates the selection of BMPs as well as the prioritization of BMP implementation.

For the SMB JG7 WMP, there are currently zero required load reductions for the Category 1 WBPCs: bacteria at the Santa Monica Bay Beaches and PCBs/DDTs in the Santa Monica Bay. Compliance with the Trash TMDL is being demonstrated through retrofitting of catch basins as outlined in the Trash Monitoring and Reporting Program (City of Los Angeles Department of Public Works, 2012). No Category 2 or Category 3 WBPCs have been identified based on currently available monitoring data. Furthermore, it is anticipated that implementation of MCMs and related activities will progressively improve water quality.

Therefore, no quantitative RAA modeling is required for this WMP. For purposes of completeness, however, each Category 1 WBPC is qualitatively discussed below.

4.1 Bacteria

The Implementation Plan for compliance with the Wet Weather Santa Monica Bay Beaches Bacteria TMDL for the larger JG7 documents historical monitoring at eight sampling locations between 1997 – 2000 for indicator bacteria. Based on the historical monitoring having fewer exceedances than the reference beach, the Implementation Plan concluded that *"as JG7 already meets the baseline goals and only needs to implement provisions to prevent "backsliding"; the non-integrated approach will be selected. No milestones are proposed, as existing conditions are the equivalent of compliance with the TMDL"* (Regional Board, 2012). As a result, the Implementation Plan states that JG7 should continue to implement BMPs, review the LA County Sanitation Districts' data, and perform investigations as necessary. Tables M-1 and M-2 of Attachment M to the MS4 Permit also show that the compliance monitoring locations within the SMB JG7 WMP geographical area, SMB 7-6 and SMB 7-8 are subject to antidegradation conditions because the beaches have fewer exceedance days than the reference beach. Therefore, there is a zero required load reduction for bacteria, and reasonable assurance is demonstrated.

As part of the adaptive management process based on monitoring data collected through the approved CIMP, structural and/or nonstructural BMPs may be proposed if needed.

4.2 PCBs and DDTs

The Santa Monica Bay TMDL for DDTs and PCBs developed WLAs for stormwater throughout the Santa Monica Bay watershed. Because the SMB JG7 WMP group area is not distinctly defined in the TMDL, the WLAs assigned to the entire Santa Monica Bay WMA are being used for this discussion. Table 6-3 in the TMDL lists the existing annual DDT and PCB loads as compared to the annual maximum allowable loads. The existing estimated loads for all of Santa Monica Bay and most of the individual watersheds are lower than the maximum allowable loads. As such, the WLAs for the entire Santa Monica Bay WMA were set equal to the existing annual loads for DDTs and PCBs as 28 grams per year (g/yr) and 145 g/yr, respectively. Therefore, there is a zero required load reduction for PCBs and DDTs, and reasonable assurance is demonstrated.

As part of the adaptive management process based on monitoring data collected through the approved CIMP, additional structural and/or nonstructural BMPs may be proposed if needed.

4.3 Debris, and Plastic Pellets

Compliance with the Debris TMDL will be met through a phased retrofit of all 218 catch basins throughout the JG7 WMP area (182 City owned and 38 County owned) by 2016, ahead of the Regional Board implementation goals for 2020 completion date. Consistent with the City's Trash Monitoring and Reporting Plan (TMRP) (City of Los Angeles Department of Public Works, 2012), *"vertical insert[s] with 5-mm openings and flow activated opening screen covers are the best suited for implementation within the City to achieve compliance with Trash TMDLs"*.

There are no industrial facilities within the SMB JG7 WMP area that use, store, transport, manufacture, or handle plastic pellets. Therefore, the City's Plastic Pellet Monitoring and Reporting Plan (PMRP) will only include an emergency response plan.

5
Adaptive Management Process

The Notice of Intent submitted to the Regional Board in December 2013 provided a schedule of interim milestones for the development of the CIMP and WMP Plan. At this time, the SMB JG7 WMP Group does not anticipate any deviations from the schedule. Completed milestones and projected completion dates for future milestones are presented in **Table 5-1.** The catch basin retrofit schedule, as provided in the TMRP, is also included in the table.

Table 5-1
WMP Schedule of Interim and Final Milestones

Deliverable	Planned Date of Completion
Submit Final Draft WMP to the Regional Board	June 2014
Submit Final Draft CIMP to the Regional Board	June 2014
57 catch basin opening cover and/or insert retrofits (cumulative) (26%)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (100%)	July 2016

The WMP is intended to be implemented as an adaptive program. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time.

5.1 Compliance Schedule

The compliance deadlines in the Santa Monica Bay Beaches Bacteria TMDL are currently in effect for SMB 7-6 and SMB 7-8. The TMDL for PCBs and DDTs does not include a compliance schedule for the WLAs for the Santa Monica Bay WMA, but because the WLAs were set based on the existing loads, the Santa Monica Bay WMA is considered to be in compliance, and therefore a compliance schedule for this TMDL is not being proposed at this time. The compliance schedule for the Santa Monica Bay Nearshore and Offshore Debris TMDL is provided in **Table 5-1**.

Part VI.C.8 of the Permit details the adaptive management process to be included in the WMP that includes the following requirements:

i. Permittees shall adapt the WMP to become more effective every two years from the date of program approval based on, but not limited to, a consideration of:

   (1) Progress toward achieving WQBELs and/or RWLs;

   (2) Permittee monitoring data;

   (3) Achievement of interim milestones;

   (4) Re-evaluation of water quality priorities and source assessment;

   (5) Non-Permittee monitoring data;

   (6) Regional Board recommendations; and

(7) Recommendations through a public participation process.

ii. Permittees shall report any modifications to the WMP in the annual report.

iii. Permittees shall implement any modifications to the WMP upon approval by the Regional Board or within 60 days of submittal if the Regional Board expresses no objections.

The adaptations to the WMP as called for in the adaptive management process essentially include a re-evaluation of water quality priorities, an updated source assessment, an effectiveness assessment of watershed control measures, and a RAA. The CIMP will gather additional data on receiving water conditions and stormwater/non-stormwater quality to inform these analyses. This process will be repeated every two years as part of the adaptive management process.

5.2 Re-Characterization of Water Quality Priorities

Water quality within the SMB JG7 WMP Group will be re-characterized using data collected as part of the approved CIMP. WBPCs may be updated as a result of changing water quality. Category 3WBPCs will be identified based on data collected as part of the approved CIMP. These classifications will be important for refocusing improvement efforts and informing the selection of future watershed control measures.

Demonstration that MS4 discharges have caused or contributed to the exceedance of receiving water limitations will be made by meeting both of the following criteria:

- Simultaneously collected water samples, as consistent with the CIMP, exceed the receiving water limitations as sampled in the receiving water and exceed the WQBELs, action levels as defined in Appendix G, or receiving water limits, in that order, at the MS4 outfall and
- The number of simultaneous samples and simultaneous exceedances meet the criteria in Tables 3.1 and 3.2 in California's Water Control Policy (Regional Board, 2004).

5.3 Source Assessment Re-evaluation

The assessment of possible sources of water quality constituents will be re-evaluated based on new information from the CIMP implementation efforts. The identification of non-MS4 and MS4 pollutant sources is an essential component of the WMP because it determines whether the source can be controlled by watershed control measures. As further monitoring is conducted and potential sources are better understood, the assessment becomes more accurate and informed.

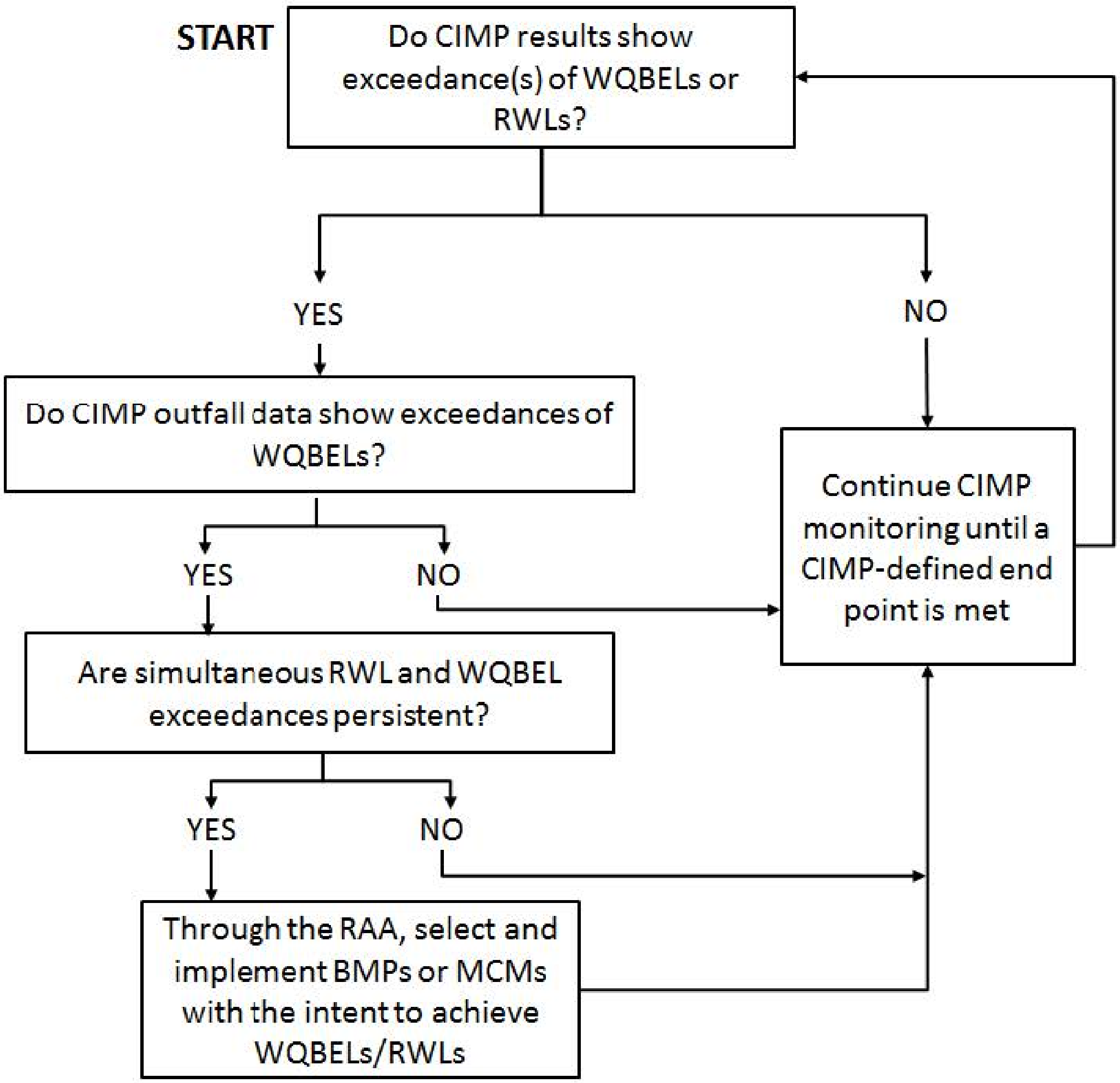
5.4 Effectiveness Assessment of Watershed Control Measures

The evaluation of BMP effectiveness is an important part of the adaptive management process and the overall WMP. Implementation of the CIMP can provide a quantitative assessment of structural BMP effectiveness, if BMPs are implemented in the future, as it relates to actual pollutant load reduction to determine how selected BMPs have performed at addressing established water quality priorities. In addition, the adaptive management process is a required step for the customization of MCMs as detailed previously. Effectiveness assessment becomes important for the selection of future control measures to be considered.

5.5 Update of Reasonable Assurance Analysis

The RAA is an iterative process that depends on the continuous refinement and calibration of the watershed models when used. Data gathered as a result of the CIMP will support adaptive management at multiple levels, including (1) generating data not previously available to support model updates (if through the course of the CIMP, modeling becomes necessary in the SMB JG7 WMP), and (2) tracking improvements in water quality over the course of WMP implementation. This process is illustrated in **Figure 5-1**.

Figure 5-1
Adaptive Management Process



6
References

CASQA, 2006. "An Introduction to Stormwater Program Effectiveness Assessment." White Paper: http://www.scvurpppw2k.com/pdfs/0405/CASQA%20White%20Paper_An%20Introduction%20to%20Stormwater%20Program%20Effectiveness%20Assessment4.pdf.

City of Los Angeles Bureau of Engineering, 2014. Navigate LA. Accessed June 10, 2014. http://navigatela.lacity.org/index01.cfm

City of Los Angeles Environmental Monitoring Division, 2012. Santa Monica Bay Shoreline Monitoring Municipal Separate Storm Sewer System (MS4) Report (June 1, 2011 – May 30, 2012).

City of Los Angeles Department of Public Works, 2012. Trash Monitoring and Reporting Plan: Santa Monica Bay Nearshore and Offshore Debris TMDL. September 19.

City of Malibu, 2012. Comment Letter – Bacteria TMDL Revisions for Santa Monica Bay Beaches. May 7, 2012.

Curren J., S. Bush, S. Ha, M.K. Stenstrom, S. Lau, I.H. Suffet, 2011. Identification of subwatershed sources for chlorinated pesticides and polychlorinated biphenyls in the Ballona Creek watershed. Science of the Total Environment 409: 2525-2533.

Edwards, M.E.; Brinkman, K.C.; Watson, J.T., 1993. "Growth of soft-stem Bulrush (Scirpus validus) plants in a gravel-based subsurface flow constructed wetland." *In: Constructed Wetlands for Water Quality Improvement*. Moshiri, G.A. (ed.). CRC Press/Lewis Publishers, Boca Raton, FL.

Ferguson, D.M., Moore, D.F., Getrich, M.A., and M.H. Zhowandai, 2005. "Enumeration and speciation of enterococci found in marine and intertidal sediments and coastal water in southern California." Journal of Applied Microbiology 99(3).

Geosyntec Consultants and Wright Water Engineers, 2012. International Stormwater Best Management Practices (BMP) Database Pollutant Category Summary Statistical Addendum: TSS, Bacteria, Nutrients, and Metals. July 2013.

Geosyntec Consultants, 2012. A User's Guide for the Structural BMP Prioritization and Analysis Tool (OCTA-SBPAT v1.0). Prepared for Orange County Transportation Authority. November 2012.

Geosyntec Consultants, 2008. A User's Guide for the Structural BMP Prioritization and Analysis Tool (SBPAT v1.0). December 2013.

Grant, S.B., Sanders, B.F., Boehm, A.B., Redman, J.A., Kim, J.H., Mrse, R.D., Chu, A.K., Gouldin, M., McGee, C.D., Gardiner, N.A., Jones, B.H., Svejkovsky, J., Leipzig, G.V., and A. Brown, 2001. "Generation of Enterococci Bacteria in a Coastal Saltwater Marsh and its Impact on Surf Zone Water Quality." Environmental Science and Technology 35(12).

Griffith, J.F., 2012. "San Diego County Enterococcus Regrowth Study." SCCWRP Technical Report.

Helsel, Dennis R. Nondetects and Data Analysis: Statistics for Censored Environmental Data. Hoboken, NJ: Wiley-Interscience, 2005. Print.

Imamura, G.J., Thompson, R.S., Boehm, A.B., and J.A. Jay, 2011. "Wrack promotes the persistence of fecal indicator bacteria in marine sands and seawater." FEMS Microbiology Ecology 77(1).

Izbicki, J., Swarzenski, P., Burton, C., and L.C. Van DeWerfhorst, 2012. "Sources of fecal indicator bacteria to groundwater, Malibu Lagoon, and the near-shore ocean, Malibu, California." Submitted 2012.

Jiang, S., McGee, C., Candelaria, L., and G. Brown, 2004. "Swimmer Shedding Study in Newport Dunes, California. Final Report." http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/tmdl/docs/swimmerreport.pdf

Lee, C.M., Lin, T.Y., Lin, C.C., Kohbodi, G.A., Bhatt, A., Lee, R., and J.A. Jay, 2006. "Persistence of fecal indicator bacteria in Santa Monica Bay beach sediments." Water Research 40(14).

Litton, R.M., Ahn, J.H., Sercu, B., Holden, P.A., Sedlak, D.L., and S.B. Grant, 2010. "Evaluation of Chemical, Molecular, and Traditional Markers of Fecal Contamination in an Effluent Dominated Urban Stream." Environmental Science and Technology 44(19).

Los Angeles County Department of Public Works, 2000. Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report. July 31.

Los Angeles County Department of Public Works, 2012. 2011-2012 Annual Stormwater Monitoring Report. http://ladpw.org/wmd/npdesrsa/annualreport/index.cfm

Los Angeles Regional Water Quality Control Board (Regional Board), 2014. "Guidelines for Conducting Reasonable Assurance Analysis in a Watershed Management Program, including an Enhanced Watershed Management Program."

Los Angeles Regional Water Quality Control Board (Regional Board), 2012. Order No. R4-2012-0175 NPDES Permit No. CAS004001 Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, except those Discharges Originating from the City of Long Beach MS4. November 8. http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/la_ms4/2012/Order%20R4-2012-0175%20-%20A%20Final%20Order%20revised.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2012. Regional Board Basin Plan Amendment for the Santa Monica Bay Beaches Bacteria TMDL. June 7, 2012. http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/90_New/Jan2013/Final%20BPA%20Attach%20A%20SMBB%20Dry&Wet%2007Jun12.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2010. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region for the Santa Monica Bay Nearshore and Offshore Debris TMDL. Attachment A to Resolution No. R10-010. Adopted November 4, 2010. http://63.199.216.6/larwqcb_new/bpa/docs/R10-010/R10-010_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Draft Santa Monica Bay Beaches Bacteria TMDL, Revised Staff Report (Dry Weather Only). January 14, 2002. http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/2002-004/02_0114_tmdl%20Dry%20Weather%20Only_web.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 02-004. http://63.199.216.6/larwqcb_new/bpa/docs/2002-004/2002-004_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate Implementation Provisions for the Region's Bacteria Objectives and to incorporate the Santa Monica Bay Beaches Bacteria

TMDL. Attachment A to Resolution No. 2002-022. http://63.199.216.6/larwqcb_new/bpa/docs/2002-022/2002-022_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 1995. Updated 2011. Water Quality Control Plan, Los Angeles Region. http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/index.shtml

Phillips, M.C., Solo-Gabriele, H.M., Piggot, A.M., Klaus, J.S., and Y. Zhang, 2011. "Relationships between Sand and Water Quality at Recreational Beaches", Water Resources 45(20).

Puigagut, J.; Villaseñor, J.; Salas, J., Bécares, E.; García, J. (2007). "Subsurface-flow constructed wetlands in Spain for the sanitation of small communities: A comparative study." *Ecological Engineering*, 30: 312-319.

Sabino, R., Verissimo, C., Cunha, M.A., Wergikowski, B., Ferreira, F.C., Rodrigues, R., Parada, H., Falcao, L., Rosado, L., Pinheiro, C., Paixao, E., and J. Brandao, 2011. "Pathogenic fungi: An unacknowledged risk at coastal resorts? New insights on microbiological sand quality in Portugal." Marine Pollution Bulletin 62: 1506-1511.

SCCWRP, 2005. Microbiological Water Quality at Reference Beaches in Southern California during Wet Weather (SCCWRP Technical Report 448). August.

SCCWRP, 2007a. Assessment of Water Quality Concentrations and Loads from Natural Landscapes (SCCWRP Technical Report 500). February.

SCCWRP, 2007b. Sources, Patterns and Mechanisms of Storm Water Pollutant Loading From Watersheds and Land Uses of the Greater Los Angeles Area, California, USA (SCCWRP Technical Report 510). March.

Schueler, T. 1996. "Irreducible Pollutant Concentrations Discharged from Urban BMPs." *Watershed Protection Techniques*, 1(3): 100-111. *Watershed Protection Techniques* 2(2): 361-363.

Sleytr, K.; Tietz, A.; Langergraber, G.; Haberl, R. (2007). "Investigation of bacterial removal during the filtration process in constructed wetlands." *Science of the Total Environment*, 380:173-180. doi:10.1016/j.scitotenv.2007.03.001.

Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. "Sources, Patterns and Mechanisms of Storm Water Pollutant Loading From Watersheds and Land Uses of the Greater Los Angeles Area, California, USA." Southern California Research Project (SCCWRP), Technical Report 510, March.

Strecker, E., Quigley, M., Urbonas, B., Jones, J., and Clary, J., 2001. "Determining Urban Stormwater BMP Effectiveness." *Journal of Water Resources Planning and Management.* May/June 2001.

Tiefenthaler, L., Stein, E.D., and K.C. Schiff, 2011. "Levels and patterns of fecal indicator bacteria in stormwater runoff from homogenous land use sites and urban watersheds." Journal of Water and Health 9:279-290.

U.S. Department of Agriculture (USDA), 2009. National Engineering Handbook (210-VI-NEH), Chapter 7. Natural Resource Conservation Service.

United States Environmental Protection Agency (USEPA), 1993. Subsurface Flow Wetlands for Wastewater Treatment, A Technology Assessment. July 2013.

United States Environmental Protection Agency (USEPA), 2012. Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs.

Ventura County Flood Control District, 2003. Stormwater monitoring report, 1997-2003.

Weisberg, S.B., and D.M. Ferguson, 2009. "North Santa Monica Bay Source Investigation Study, Ramirez Creek and Escondido Creek, Malibu, 2009 Summary and Recommended Studies." SCCWRP.

Weston Solutions, 2010. "Tecolote Creek Microbial Source Tracking Summary – Phases I, II, and III."

Wright Water Engineers (WWE) and Geosyntec Consultants, 2007. FAQ: Why does the International Stormwater BMP Database Project omit percent removal as a measure of BMP performance?

Table A1 – Average, Median, Minimum, and Maximum of Results for Santa Monica Bay Shoreline Monitoring Data (SMB JG7 WMP Group Area)

Analyte	Event Type	Station	Average (MPN/100ml)						Median (MPN/100ml)						Min (MPN/100ml)						Max (MPN/100ml)					
			2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Total Coliform	Dry-Summer		82.6	34.2	42.9	28.1	102.1	94.7	12	18	31	18	36	59	1	3	3	1	1	4	950	140	240	120	1400	340
Total Coliform	Dry-Winter		21	391.1	29.2	131.3	91.1	39.3	8.5	30.5	16	19.5	33.5	18	3	1	1	4	5	8	160	3600	78	570	540	120
Total Coliform	Wet		101.6	352.3	244.1	172.6	796.1	93.8	98	230	73	71	90	65.5	4	18	4	4	4	12	240	1000	1600	800	8000	310
Fecal Coliform	Dry-Summer		24.8	9.6	9.3	11.6	41.3	14.2	2.5	3.5	4	5.5	9	6	1	1	1	1	1	1	580	50	56	72	580	110
Fecal Coliform	Dry-Winter	SMB 7-6	9.9	34	13.3	101.4	52.4	16.4	2	8.5	3.5	7	15.5	8	1	1	1	1	1	4	100	250	78	480	470	62
Fecal Coliform	Wet		11.3	26.5	21.2	23.6	43	35.3	6.5	31.5	5	13	11	8	1	5	1	3	1	1	44	40	100	78	260	160
Enterococcus	Dry-Summer		24.7	11.6	16.2	17.1	17.4	11.1	2	3	4	7.5	4	4	1	1	1	1	1	1	360	78	260	90	120	160
Enterococcus	Dry-Winter		11.1	197	38.5	158.1	34.5	12.8	4	16	14	7.5	10	4	1	1	1	1	1	1	44	2600	140	1700	190	62
Enterococcus	Wet		119.4	75.8	82	99	141.8	6.8	46	69	24	14	42	6	1	12	1	1	1	3	560	170	270	1000	1200	16
Total Coliform	Dry-Summer		53.4	23.2	12.3	47	460.8	46.2	9	4	6.5	10	18	12	1	1	1	1	1	1	1200	200	73	200	8800	600
Total Coliform	Dry-Winter		22.9	60.1	11.4	1210	102.6	97.9	15.5	12	8	35	14	27	1	1	1	1	1	1	120	600	36	13000	1000	410
Total Coliform	Wet		73	126.2	59	230.3	95.5	193	55	82	36	115.5	54.5	27.5	1	18	1	1	3	8	200	290	200	1200	200	690
Fecal Coliform	Dry-Summer		4.8	3.1	1.8	5.1	35.3	6.6	1	1	1	1	4	1	1	1	1	1	1	1	30	27	5	33	660	74
Fecal Coliform	Dry-Winter	SMB 7-8	6.8	16.4	1.8	2.4	3	2.8	4	1	1	1	2	1	1	1	1	1	1	1	20	170	4	8	8	15
Fecal Coliform	Wet		4.6	16.5	6.9	25	13.5	10.4	5	11	3	4.5	4	3	1	4	1	1	1	1	9	46	36	200	100	50
Enterococcus	Dry-Summer		5	5.2	2.9	6.7	32.5	2	1	1	1	1	1	1	1	1	1	1	1	1	44	62	19	97	780	19
Enterococcus	Dry-Winter		7.9	37.5	4	20.7	3.3	2.2	3	4	1	3	1	1	1	1	1	1	1	1	54	540	17	180	13	11
Enterococcus	Wet		23	44.2	19.9	116.6	35.2	10.5	9.5	31	8	12	5.5	1.5	1	4	1	1	1	1	70	120	100	1100	280	49

CITY OF LOS ANGELES

CALIFORNIA

BOARD OF PUBLIC WORKS MEMBERS

KEVIN JAMES
PRESIDENT

MONICA RODRIGUEZ
VICE PRESIDENT

MATT SZABO
PRESIDENT PRO TEMPORE

MICHAEL R. DAVIS
COMMISSIONER

BARBARA ROMERO
COMMISSIONER

ERIC GARCETTI
MAYOR

BUREAU OF SANITATION

ENRIQUE C. ZALDIVAR
DIRECTOR

TRACI J. MINAMIDE
CHIEF OPERATING OFFICER

VAROUJ S. ABKIAN
ADEL H. HAGEKHALIL
ALEXANDER E. HELOU
ASSISTANT DIRECTORS

VACANT
CHIEF FINANCIAL OFFICER

1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939
WWW.LACITYSAN.ORG

June 27, 2014

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

Dear Mr. Unger:

SUBMITTAL OF COORDINATED INTEGRATED MONITORING PROGRAM FOR THE CITY OF LOS ANGELES AREA IN JURISDICTIONAL GROUP 7 OF THE SANTA MONICA BAY WATERSHED

Please find attached the Coordinated Integrated Monitoring Program (CIMP) for the City of Los Angeles area in Jurisdictional Group 7 of the Santa Monica Bay watershed. The City of Los Angeles, as lead agency for this area, has prepared this CIMP on behalf of itself and Los Angeles County Flood Control District (LACFCD). LACFCD has reviewed the draft CIMP prior to submission to the Regional Water Board, and we appreciate their collaboration in the preparation of the document.

The CIMP for the City of Los Angeles area in Jurisdictional Group 7satisfies the requirements provided by Attachment E, the Monitoring and Reporting Program (MRP), of the new MS4 Permit (Order No. R4-2012-0175). The CIMP provides a discussion of the monitoring locations, constituents, and monitoring frequencies, details of analytical and monitoring procedures, and an approach for implementation of the CIMP. Concurrently with this CIMP, we are submitting Geographic Information System (GIS) database to satisfy the requirements of Part VII.A of the MRP.

We appreciate the discussions with and the input received from Regional Water Board staff during the development of this CIMP and we look forward to the comments on the CIMP by your staff and finalizing this document.

Should you have any questions about this submittal, please contact me at Shahram.Kharaghani@lacity.org or phone (213) 485-0587, or your staff may contact Ms. Donna Chen at Donna.Chen@lacity.org or phone (213) 485-3928.

Sincerely,

Robert Vega for
SHAHRAM KHARAGHANI, Ph.D., P.E., BCEE
Program Manager

Attachment

SK:HC
WPDCR9132

cc: Renee Purdy, California Regional Water Quality Board, Los Angeles Region
Ivar Ridgeway, California Regional Water Quality Board, Los Angeles Region
Adel Hagekhalil, City of Los Angeles, Bureau of Sanitation
Hubertus Cox, City of Los Angeles, Bureau of Sanitation
Gary Hildebrand, County of Los Angeles, Department of Public Works

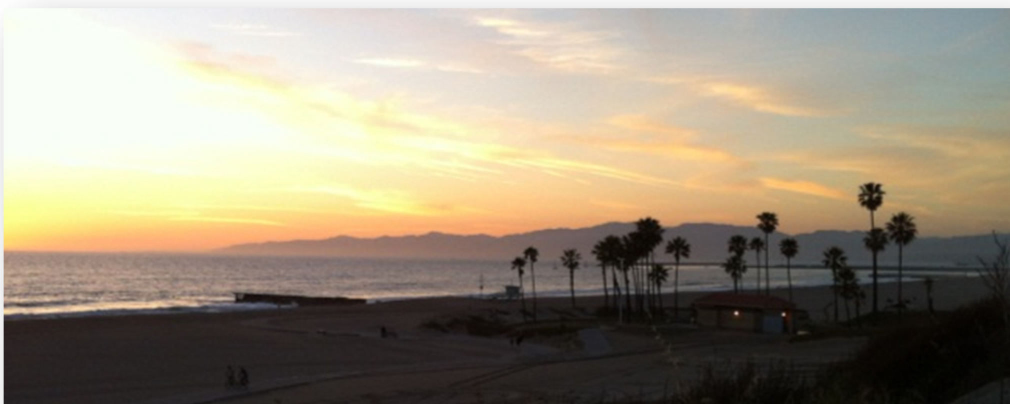
June 2014

SANTA MONICA BAY JG7 WATERSHED MANAGEMENT PLAN GROUP

Coordinated Integrated Monitoring Program (CIMP)

Prepared by

City of Los Angeles and Los Angeles County Flood Control District



The MWH Team

MWH Geosyntec consultants CWE M2 Resource Consulting, Inc.

RB-AR16686

Table of Contents

Section 1 Introduction 1

1.1 SANTA MONICA BAY JURISDICTIONAL GROUP 7 WATERSHED MANAGEMENT PLAN AREA 1

1.2 CIMP OVERVIEW 7

1.2.1 Receiving Water Monitoring 7

1.2.2 Stormwater Outfall Monitoring 7

1.2.3 Non-Stormwater Outfall Program 7

1.2.4 New Development and Redevelopment Effectiveness Tracking 8

1.2.5 Regional Studies 8

1.2.6 Special Studies 8

Section 2 Receiving Water Monitoring Program 9

2.1 EXISTING MONITORING PROGRAMS 9

2.1.1 Santa Monica Bay Beaches Bacteria TMDL 11

2.1.2 Santa Monica Bay Nearshore and Offshore Debris TMDL 13

2.1.3 Santa Monica Bay DDTs and PCBs TMDL 14

2.2 CIMP RECEIVING WATER MONITORING SITE 15

2.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION 18

2.3.1 Wet Weather 18

2.3.2 Dry Weather 18

2.4 RECEIVING WATER MONITORING SUMMARY 19

Section 3 MS4 Infrastructure Database 20

Section 4 Stormwater Outfall Monitoring 21

4.1 PROGRAM OBJECTIVES 21

4.2 STORMWATER OUTFALL MONITORING SITE 21

4.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION 22

Section 5 Non-Stormwater Outfall Screening and Monitoring Program 24

5.1 PROGRAM OBJECTIVES 24

5.2 NON-STORMWATER OUTFALL SCREENING AND MONITORING PROGRAM 25

5.3 IDENTIFICATION OF OUTFALLS WITH SIGNIFICANT NON-STORMWATER DISCHARGES 25

RB-AR16687

5.4 SIGNIFICANT NON-STORMWATER DISCHARGE SOURCE IDENTIFICATION 26
5.5 NON-STORMWATER DISCHARGE MONITORING 28
5.5.1 Monitoring Frequency, Parameters, and Duration 28
5.6 NON-STORMWATER OUTFALL PROGRAM SUMMARY 29
Section 6 New Development/Re-Development Effectiveness Tracking Program 30
6.1 PROGRAM OBJECTIVES 31
6.2 EXISTING NEW DEVELOPMENT/RE-DEVELOPMENT TRACKING PROCEDURES 31
6.3 SPECIAL CONSIDERATIONS FOR DATA MANAGEMENT AND REPORTING 31
6.3.1 Data Management 31
6.3.2 Additional Data 32
6.3.3 Reporting 33
6.4 SUMMARY OF NEW DEVELOPMENT/RE-DEVELOPMENT EFFECTIVENESS TRACKING 36
Section 7 Regional Studies 37
Section 8 Special Studies 38
Section 9 Non-Direct Measurements 39
Section 10 Adaptive Management 40
10.1 INTEGRATED MONITORING AND ASSESSMENT PROGRAM 40
10.2 CIMP REVISION PROCESS 40
Section 11 Reporting 42
11.1 DOCUMENTS AND RECORDS 42
11.1.1 Semi-Annual Data Submittal 42
11.1.2 Annual Monitoring Reports 43
11.1.3 Signatory and Certification Requirements 43
Section 12 Schedule for CIMP Implementation 45
Section 13 References 46

RB-AR16688

List of Figures

Figure 1	Geographical Area and Land Uses
Figure 2	Percent Impervious
Figure 3	Municipal Separate Storm Sewer System (MS4)
Figure 4	Existing Monitoring Stations
Figure 5	CIMP Monitoring Stations

List of Tables

Table 1	Land Use Summary
Table 2	Water Body-Pollutant Priorities
Table 3	Summary of Reconsideration Elements for SMBBB TMDL
Table 4	SMBBB TMDL Water Quality-Based Effluent Limitations and Receiving Water Limitations
Table 5	Annual Allowable Exceedance Days of the Single Sample Objective (days)
Table 6	Santa Monica Bay Debris TMDL Compliance Schedule
Table 7	Santa Monica Bay DDTs and PCBs TMDL Waste Load Allocations
Table 8	Land Use Overview of Outfall Nearest to Receiving Water Monitoring Site SMBJ7-RW-1
Table 9	Receiving Water Monitoring Parameters and Annual Frequency at SMBJ7-RW-1
Table 10	Land Use Distribution for Catchment for Outfall Monitoring Site SMBJ7-O-6
Table 11	Stormwater Outfall Monitoring Parameters and Annual Frequency at SMBJ7-O-6
Table 12	Non-Stormwater Screening Sites in SMB JG7 WMP Group Area
Table 13	Source Identification Types
Table 14	Non-stormwater Outfall Monitoring Parameters and Annual Frequency
Table 15	Development Review Process and Data Collection
Table 16	Example Data Collection Template

List of Attachments

Attachment A	LACFCD Background Information
Attachment B	Analytical and Monitoring Procedures
Attachment C	Outfall Investigation Photographic Log
Attachment D	Example Field and Chain-of-Custody Forms

LIST OF ACRONYMS

Acronym	Definition
40 CFR	Code of Federal Regulations
AED	Allowable Exceedance Day
AIN	Assessor's Identification Number
ASBS	Areas of Special Biological Significance
ASTM	American Society for Testing and Materials
Basin Plan	Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CCW	Calleguas Creek Watershed
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIMP	Coordinated Integrated Monitoring Program
County	Los Angeles County
COC	Chain of Custody
CRM	Certified/ Standard Reference Material
CSMP	Coordinated Shoreline Monitoring Plan
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CWC	California Water Code
DAP	Discharge Assessment Plan
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
EDTA	Ethylene Diamine Tetra Acetic Acid
EIA	Effective Impervious Area
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ES	Executive Summary
EWMP	Enhanced Watershed Management Program
FLPE	Fluorinated high-density polyethylene
GIS	Geographic Information System
GM	Geometric Mean
GWQC	General Water Quality Constituents
HUC	Hydrologic Unit Codes
IC/ID	Illicit Connection/Illicit Discharge
IMCR	Integrated Monitoring Compliance Report
IMP	Integrated Monitoring Program

IWC	In-stream waste concentration
JG	Jurisdictional Group
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LCS	Laboratory Control Sample/Standard
LID	Low Impact Development
MAL	Municipal Action Limits
MBAS	Methylene Blue Active Substances
MCM	Minimum Control Measure
MDL	Method Detection Limit
MES	Mass Emission Stations
MF	Multi-Family
MGD	Million Gallons per Day
MPN	Most Probable Number
MRP	Monitoring and Report Program
MS4	Municipal Separate Storm Sewer System
MTBE	Methyl tert-butyl ether
NA	Not Applicable
NELAP	National Environmental Laboratory Accreditation Program
NIST	National Institute for Standards and Technology
NPDES	National Pollutant Discharge Elimination System
NSW	Non-Stormwater
NTU	Nephelometric Turbidity Units
OC	Organochlorine
OP	Organophosphate
PBO	Piperonyl Butoxide
PCB	Polychlorinated biphenyl
PDF	Portable Document Format
PE	Polyethylene
Permit	Permit No. R4-2012-0175
PMRP	Pellets Monitoring and Reporting Plan
PRM	Pathogen Related Mortality
QA	Quality Assurance
QC	Quality Control
QPF	Quantitative Precipitation Forecast
RAA	Reasonable Assurance Analysis
REC-1/REC-2	Recreational Beneficial Use Designations
Regional Board	Los Angeles Regional Water Quality Control Board
RL	Reporting Limits
RPD	Relative Percent Difference
RW	Receiving Water

RWL	Receiving Water Limitations
RWQCB	Regional Water Quality Control Board
SCCWRP	Southern California Coastal Water Research Project
SDTF	Standardized Data Transfer Format
SF	Single Family
SIC	Standard Industrial Classification System
SM	Standard Methods
SMB	Santa Monica Bay
SMB JG7 WMP Group	Santa Monica Bay Enhanced Watershed Management Program Group
SMBBB	Santa Monica Bay Beaches Bacteria
SMC	Southern California Stormwater Monitoring Coalition
SMURRF	Santa Monica Urban Runoff Recycling Facility
SOP	Standard Operating Procedure
SPE	Solid Phase Extraction
SQO	Sediment Quality Objectives
SSC	Suspended Sediment Concentration
STS	Sodium thiosulfate
SVOC	Semi Volatile Organic Compound
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TKN	Total Kjehdahl Nitrogen
TM	Technical Memo
TMDL	Total Maximum Daily Load
TMRP	Trash Monitoring and Reporting Plan
TOC	Total Organic Carbon
TRE	Toxicity Reduction Evaluation
TSS	Total Suspended Solids
TST	Test of Significant Toxicity
UC	University of California
USEPA	United States Environmental Protection Agency
USGS	United sStates Geological Survey
VOC	Volatile Organic Compound
WBPCs	Water Body-Pollutant Combinations
WDID	State Waste Discharge Identification
WLA	Waste Load Allocations
WMA	Watershed Management Area
WMP	Watershed Management Program
WQBEL	Water Quality-Based Effluent Limits

Section 1
Introduction

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) has been a participating agency of Jurisdictional Group 7 (JG7) of the Santa Monica Bay (SMB) Watershed since the adoption of the Santa Monica Bay Beaches Bacteria Total Maximum Daily Loads (TMDLs) in 2003. However, the City of Los Angeles and the other MS4 permittees in JG7 could not reach an agreement for a collaborative approach to satisfying the requirements of the MS4 permit. Therefore, on November 26, 2013 the Regional Board requested that the City and the Los Angeles County Flood Control District (LACFCD) (see **Attachment A** for background on the LACFCD), collectively referred to as the SMB JG7 WMP Group, pursue a WMP instead of an EWMP to fulfill the requirements of the MS4 Permit. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural BMP implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). As such, in December of 2013 the JG7 SMB WMP Group submitted a revised notice of intent to develop a WMP for the City of Los Angeles land area within JG7 of the Santa Monica Bay Watershed.

This Coordinated Integrated Monitoring Program (CIMP) fulfills the requirements presented in the Monitoring and Reporting Program (MRP) portion of the Permit, which are specified in Attachment E of the Permit. The primary objectives for the MRP are listed in Part II.A of the MRP, as follows:

- Assess the chemical, physical, and biological impacts of discharges from the MS4 on receiving waters;
- Assess compliance with RWLs and WQBELs established to implement Total Maximum Daily Load (TMDL) wet-weather and dry-weather waste load allocations (WLAs);
- Characterize pollutant loads in MS4 discharges;
- Identify sources of pollutants in MS4 discharges; and
- Measure and improve the effectiveness of pollutant controls implemented under the Permit.

Additionally, the CIMP incorporates TMDL monitoring requirements to unify monitoring efforts and to provide consistent observations of watershed conditions.

1.1 SANTA MONICA BAY JURISDICTIONAL GROUP 7 WATERSHED MANAGEMENT PLAN AREA

Santa Monica Bay is an integral part of the larger geographic region commonly known as the Southern California Bight (or, bend in the coastline). It is bordered offshore by the Santa Monica Basin, to the north by the rocky headlands of Point Dume, and to the south by the Palos Verdes Peninsula, and onshore by the Los Angeles Coastal Plain and Santa Monica Mountains. The 264,960 acres of land that drains naturally to Santa Monica Bay is bordered on the north by the Santa Monica Mountains from the Ventura-

Los Angeles County line (to the west) to Griffith Park (to the east), extending south and west across the Los Angeles Coastal Plain to include the area east of Ballona Creek and north of Baldwin Hills. South of Ballona Creek, a narrow coastal strip between Playa del Rey and the Palos Verdes Peninsula forms the southern boundary of the watershed. The Santa Monica Bay itself is the submerged portion of the Los Angeles Coastal Plain. The continental shelf extends seaward to the shelf break about 265 feet underwater, then drops steeply to the Santa Monica Basin at about 2,630 feet underwater.

Nearshore Santa Monica Bay is defined by the Ocean Plan as a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot contour, whichever is further from the shoreline. Offshore is defined as the waters between the near shore zone and the limit of State Waters. Lastly, State Waters, according to Section 13200 of the California Water Code (CWC), extends three nautical miles into the Pacific Ocean from the line of mean lower low water marking the seaward limits of inland waters and three nautical miles from the line of mean lower low water on the mainland and each offshore island.

The SMB JG7 WMP Group area lies within the larger JG7 boundary in the southern portion of the Santa Monica Bay watershed. The JG7 WMP area includes that portion of the area within the Hydrologic Unit Codes (HUC-12): Manhattan Beach – Frontal Santa Monica Bay which extends along the shoreline from the Point Fermin lighthouse up to the Ocean Trails Reserve.

The SMB JG7 WMP Group area is bordered on the north approximately by the Bogdanovich Recreation Center and W 25th street and the South by Royal Palms Beach, White Point Beach and other shoreline that drains to the Santa Monica Bay. This area is bordered on the West by the City of Ranchos Palos Verdes and on the East by portions of Angels Gate park. The SMB JG7 WMP Group area is solely under the jurisdiction of the City of Los Angeles and includes all of the White Point Natural Preserve and Education Center as well as the majority of Point Fermin Park.

The SMB JG7 WMP Group is comprised of two participating agencies: the City of Los Angeles and LACFCD. The SMB JG7 WMP Group area, which consists solely of JG7 area under the jurisdiction of the City, totals approximately 954.4 acres, which is approximately 9% of the entire JG7 area within the Santa Monica Bay Watershed (**Figure 1**). The geographical scope of the SMB JG7 WMP Group area includes land owned by the Los Angeles Air Force Base Pacific Crest Housing Area, which the MS4 Permittees have no jurisdiction over and thus is excluded from the SMB JG7 WMP Group Area. Excluding these areas, the WMP Group area covers approximately 907.6 acres. Approximate land area and land use summaries for the JG7 WMP Group area is listed in **Table 1** and presented in **Figure 1**. The most prevalent land use is residential (69%) and vacant/open space (26%). The open space area includes 102 acres of restored coastal sage scrub habitat and hiking trails located within the White Point Nature Preserve Wild Park. The remaining area consists of a mixture of commercial, education, and industrial land uses. **Figure 2** illustrates the distribution of percent imperviousness across the JG7 WMP Group area.

Table 1
Land Use Summary

Land Use	SMB JG7 WMP Group	
	Acres	% of Total
Agriculture	0.0	0.0%
Commercial	24.1	2.5%
Industrial	0.5	0.1%
Education	32.2	3.4%
Multi-Family Residential	118.4	12.4%
Single Family Residential	535.9	56.2%
Vacant/Open	243.3	25.5%
Transportation	0.0	0.0%
Total	954.4	100%

Figure 3 depicts the MS4 system in the JG7 WMP Group area, including approximate catchment delineations and storm drain diameters. Attachment A of the MS4 Permit defines a major MS4 outfall (or ‘‘major outfall’’) as a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive stormwater from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more) (40 CFR § 122.26(b)(5)).

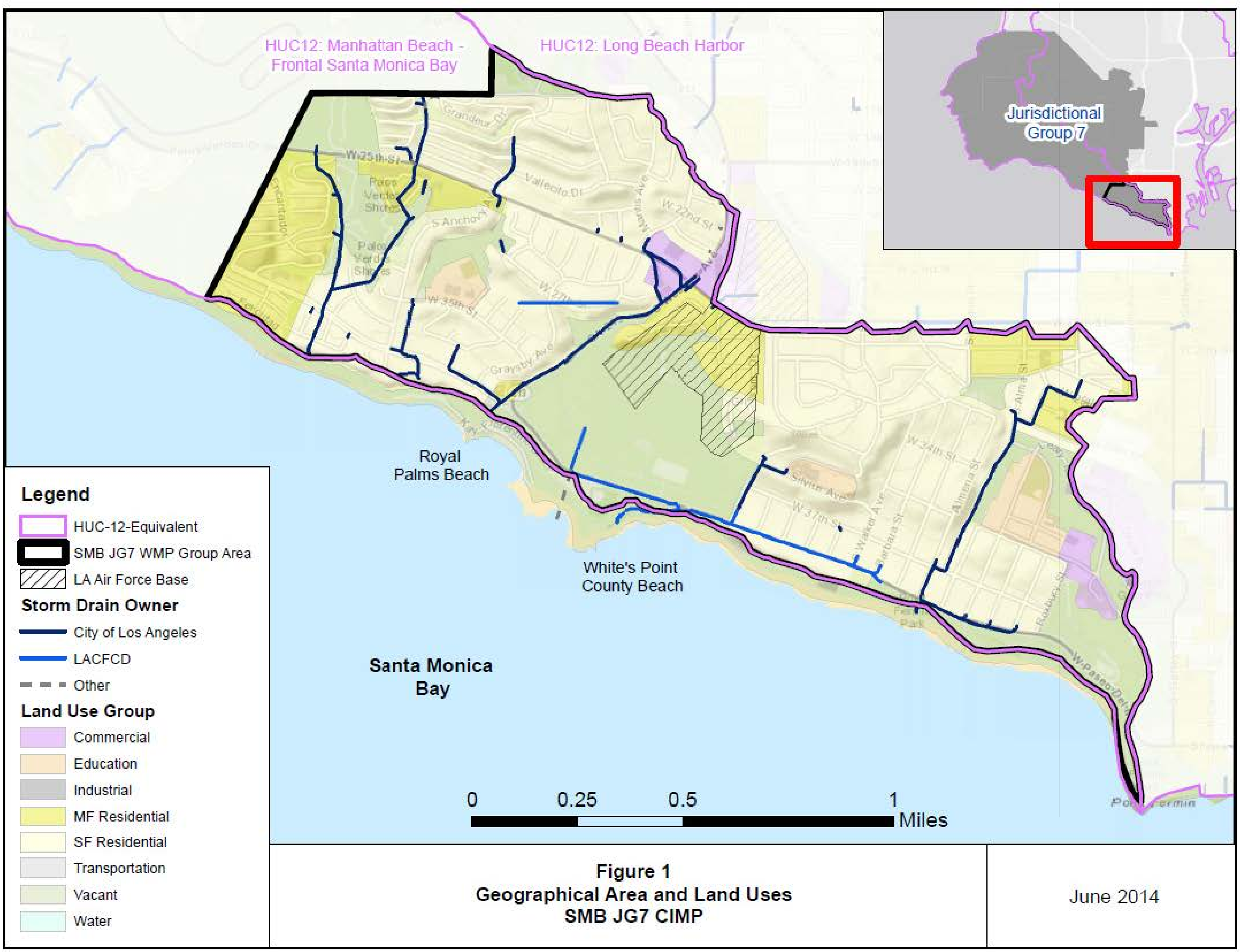


Figure 1
Geographical Area and Land Uses
SMB JG7 CIMP

June 2014

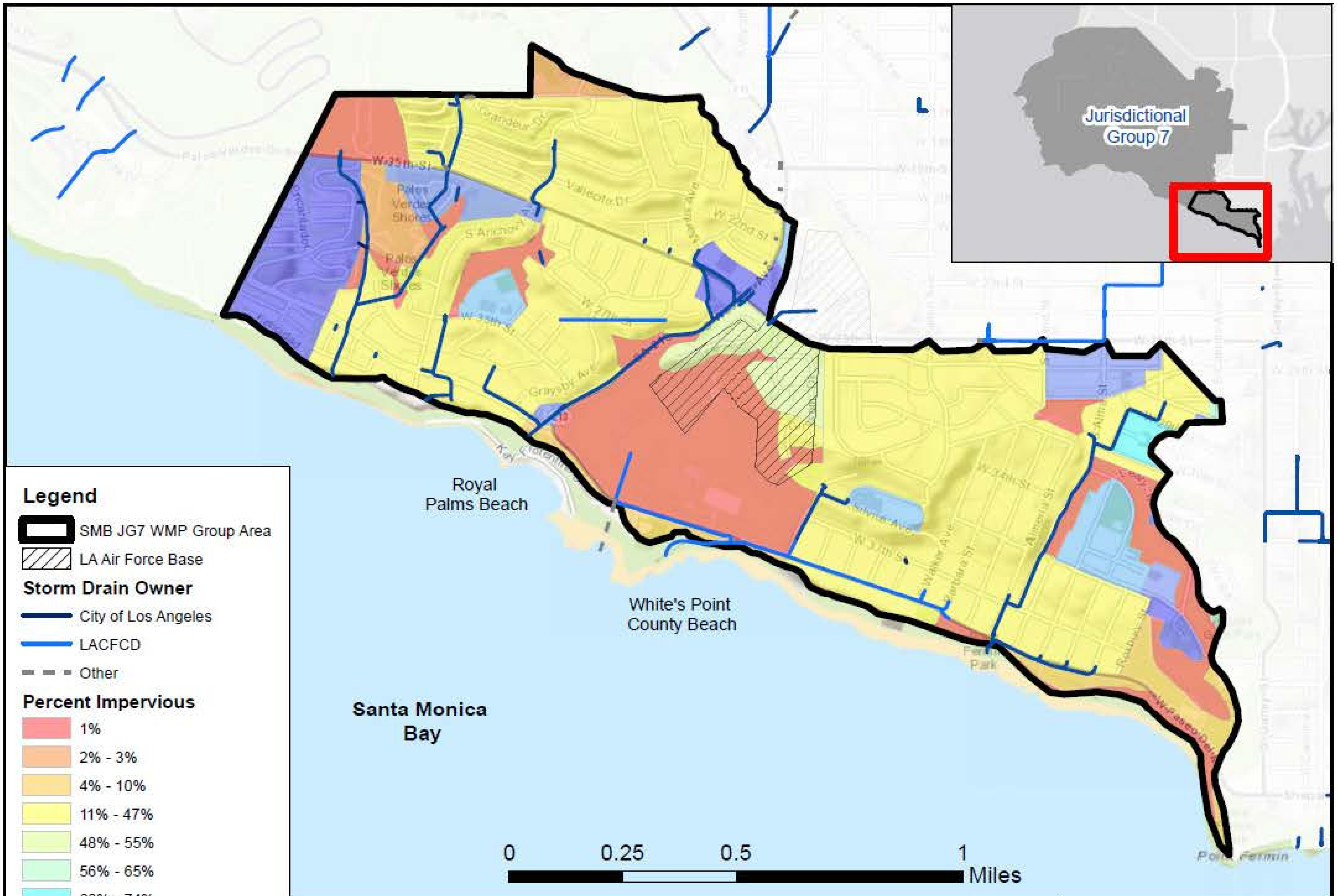


Figure 2
Percent Impervious
SMB JG7 CIMP

June 2014

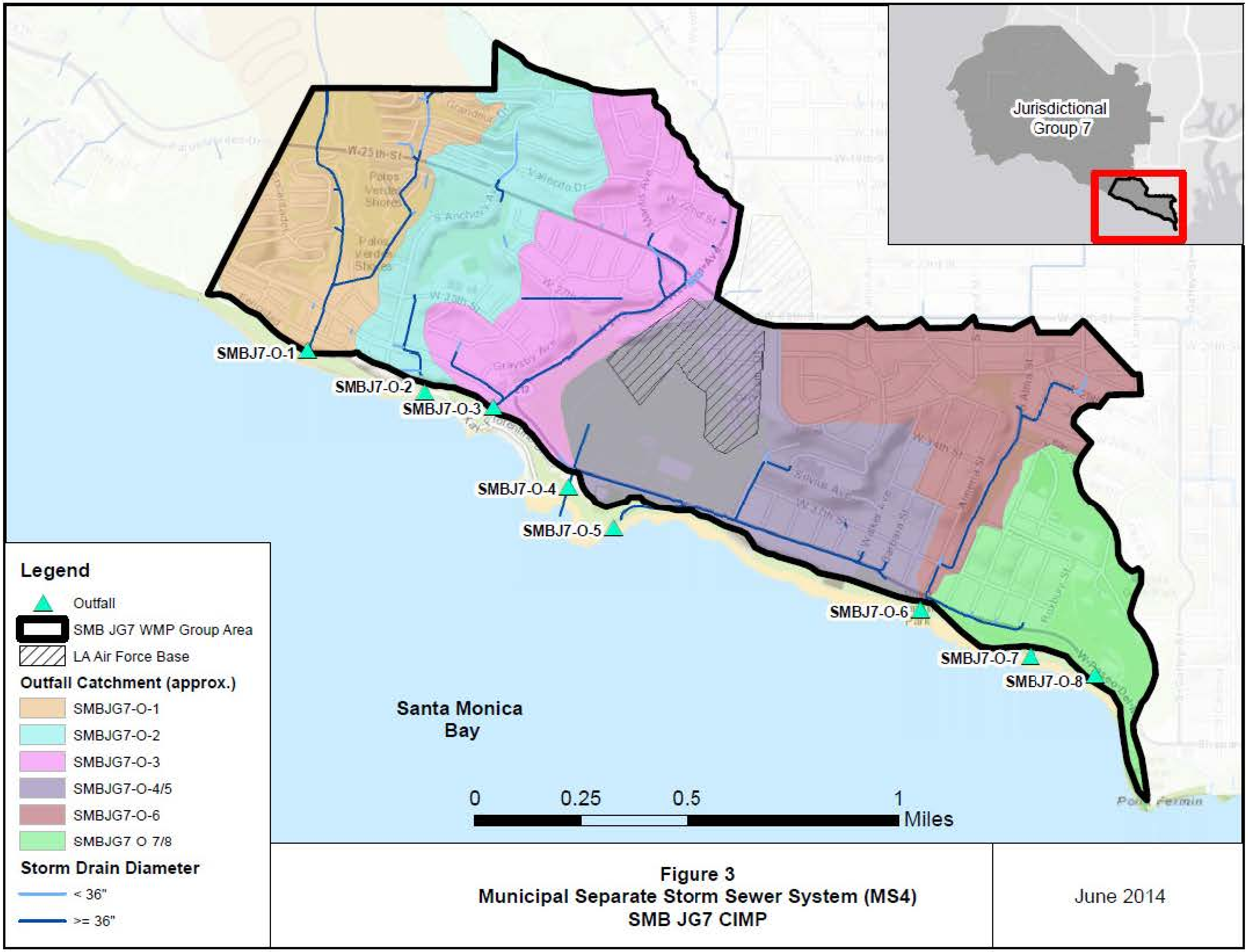


Figure 3
Municipal Separate Storm Sewer System (MS4)
SMB JG7 CIMP

RB-AR16698

The receiving waters defined by the Water Quality Control Plan, Los Angeles Region (Basin Plan) (Regional Board, 1995, Updated 2011) within the SMB JG7 WMP Group area include:

- Santa Monica Bay – Offshore/Nearshore Zone
- Royal Palms Beach
- White's Point County Beach

Attachment B of the MS4 Permit shows mapped United States Geological Survey Hydrologic Units, and other features, based on HUC-12 watershed boundaries. In lieu of these specified boundaries, the March 26, 2014 Regional Board Reasonable Assurance Analysis (RAA) Guidelines allows WMP groups to use HUC-12 equivalent watersheds, prepared by the LACFCD. Using the LACFCD HUC-12 layer and numbering conventions, the LACFCD HUC-12 boundary relevant to the SMB JG7 WMP Group is Manhattan Beach – Frontal Santa Monica Bay (180701040500).

1.2 CIMP OVERVIEW

The CIMP is designed to provide the information necessary to guide management decisions in addition to providing a means to measure compliance with the Permit. The SMB JG7 WMP Group's CIMP addresses the six required elements of the Permit MRP:

1. Receiving Water Monitoring
2. Stormwater Outfall Monitoring
3. Non-Stormwater Outfall Monitoring
4. New Development and Redevelopment Effectiveness Tracking
5. Regional Studies
6. Special Studies

Each of the six CIMP elements is summarized below.

1.2.1 Receiving Water Monitoring

Receiving water monitoring is intended to assess whether water quality objectives are being achieved, to determine if beneficial uses are being supported, and to track trends in constituent concentrations over time. One receiving water monitoring site was selected. **Section 2** discusses SMB JG7 WMP Group's receiving water monitoring program.

1.2.2 Stormwater Outfall Monitoring

Stormwater outfall monitoring assesses compliance with municipal action limits (MALs), WQBELs derived from TMDL WLAs, and evaluates whether discharges have the potential to have caused or contributed exceedances of RWLs derived from TMDL WLAs or receiving water quality objectives.

The majority of storm drains within the SMB JG7 WMP Group generally drain towards Santa Monica Bay. One stormwater outfall monitoring site was selected for further evaluation, including safety and accessibility considerations. A synopsis of the outfall drainage area, along with an analysis of its land use/zoning characteristics is summarized in **Section 4**.

1.2.3 Non-Stormwater Outfall Program

To fulfill the Permit requirements, the MRP requires Permittees to implement a Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) which is focused on eliminating non-permitted non-stormwater discharges to receiving waters. Additional details of the Non-Stormwater Program are presented in **Section 5**.

1.2.4 New Development and Redevelopment Effectiveness Tracking

The New Development/Re-Development Effectiveness Tracking is required to identify the information necessary for data management and annual compliance reporting. The SMB JG7 WMP Group will maintain an informational database record for each new development/re-development project subject to the minimum control measure (MCM) and their adopted Low Impact Development (LID) Ordinance. In addition, the SMB JG7 WMP Group will implement a tracking system for new development/re-development projects that have been conditioned for post-construction BMPs. **Section 6** presents the new development and redevelopment effectiveness tracking system for the SMB JG7 WMP Group.

1.2.5 Regional Studies

The MRP identifies one regional study: the SMC Regional Watershed Monitoring Program. None of the SMC monitoring sites are located within the SMB JG7 WMP Group area due to a lack of streams or rivers.

1.2.6 Special Studies

The MRP requires each Permittee to be responsible for conducting special studies required in an effective TMDL or an approved TMDL Monitoring Plan. Special studies options are further discussed in **Section 8**.

Section 2
Receiving Water Monitoring Program

Receiving water bodies within the SMB JG7 WMP Group area were presented in Section 1. The receiving water bodies (Santa Monica Bay – Offshore/Nearshore zone, Royal Palms Beach, and White Point Beach) are designated as having existing recreational beneficial uses (REC-1 and REC-2), among others. The objectives of the CIMP receiving water monitoring program include the following (Part II.E.1 of the MRP):

- Determine whether the receiving water limitations are being achieved;
- Assess trends in pollutant concentrations over time, or during specified conditions; and
- Determine whether the designated beneficial uses are fully supported as determined by water chemistry, as well as aquatic toxicity and bioassessment monitoring.

The requirements in the MRP for selecting receiving water monitoring sites include utilizing receiving water monitoring sites at previously designated LACDPW mass emission (ME) stations, TMDL receiving water compliance points, and additional receiving water locations representative of the impacts from MS4 discharges. Through the evaluation of previously-utilized and existing receiving water monitoring sites, no existing ME stations were located. As shown in **Figure 4**, two existing Santa Monica Bay Beaches Bacteria TMDL monitoring stations are located within the SMB JG7 WMP Group's jurisdictional area (SMB 7-6 and SMB 7-8). Additionally, four sites in the Santa Monica Bay offshore of the JG7 WMP Group area are monitored as part of the Bight Program. Existing monitoring programs are discussed in Section 2.1 below.

One receiving water station was identified for monitoring as part of the CIMP. Details on the monitoring site selection as well as the proposed frequency, parameters, and duration of monitoring are discussed in Section 2.2 through 2.4.

2.1 EXISTING MONITORING PROGRAMS

A regional monitoring program to assess the health of the Southern California Bight has been coordinated through Southern California Coastal Water Research Project (SCCWRP) at five-year intervals including 1994, 1998, 2003, 2008, and 2013. The Bight Regional Monitoring programs include:

- Coastal Ecology
- Shoreline Microbiology
- Offshore Water Quality
- Rocky Reef
- Areas of Special Biological Significance (ASBS)
- Coastal Wetlands and Estuaries

Through these programs, the SCCWRP has been able to conduct a regional assessment of the cumulative impacts from multiple sources. Bight sampling locations are shown in **Figure 4**. The monitoring site were analyzed for trace metals, Polychlorinated biphenyls (PCBs), Polycyclic aromatic hydrocarbons (PAHs), Poly Brominated Diphenyl Ethers (PBDEs), chlorinated hydrocarbons, total organic carbon (TOC), nitrogen, phosphorus, and grain size.

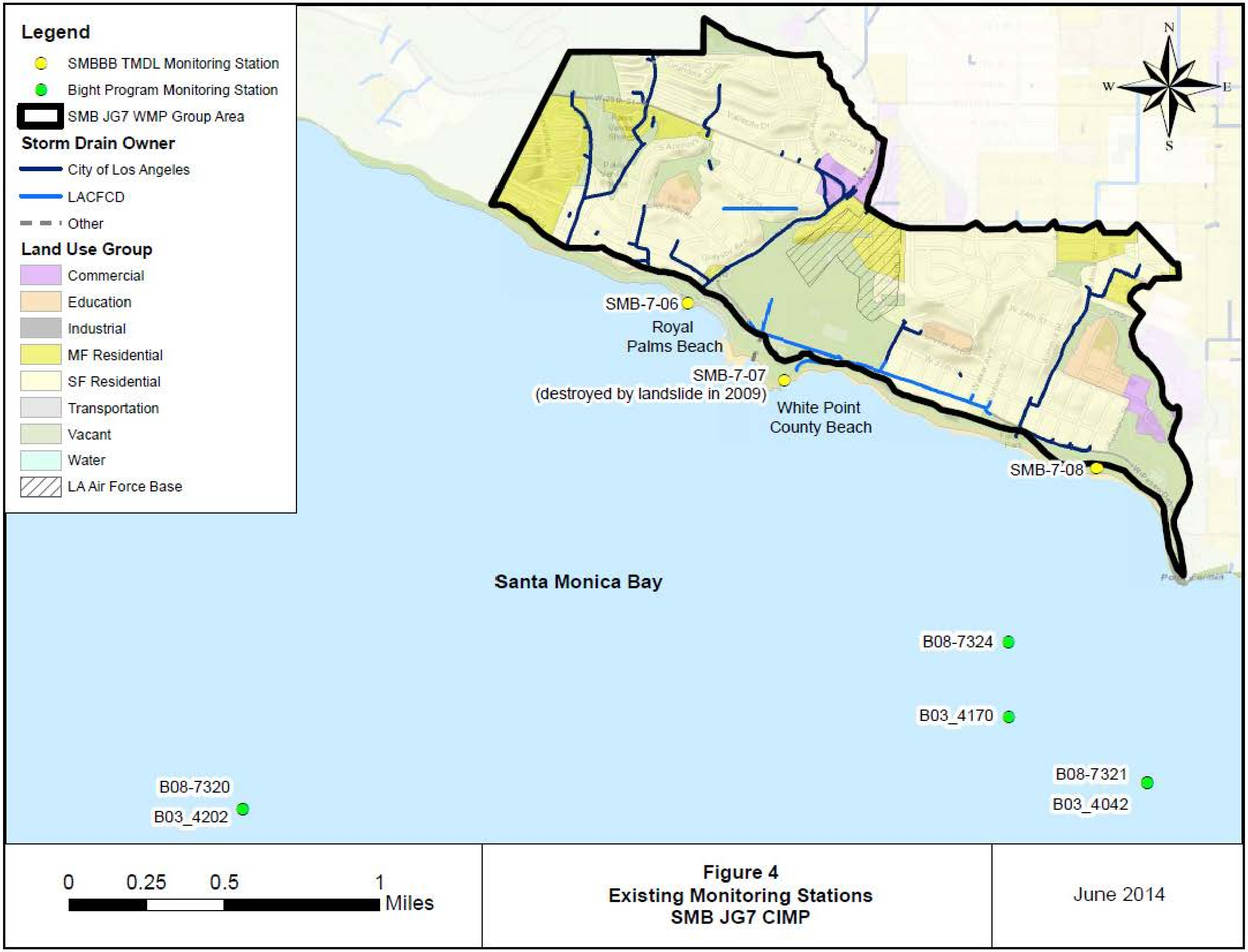


Figure 4
Existing Monitoring Stations
SMB JG7 CIMP

The TMDLs addressing water body-pollutant combinations within or downstream of the SMB JG7 WMP Group include:

- Santa Monica Bay Beaches Bacteria TMDL (Wet and Dry), July 15, 2003 (SMBBB TMDL);
- Santa Monica Bay TMDL for Dichlorodiphenyltrichloroethane (DDTs) and Polychlorinated biphenyls (PCBs), March 26, 2012 (SMB DDT and PCB TMDL); and
- Santa Monica Bay Nearshore and Offshore Debris TMDL, March 20, 2012 (SMB Debris TMDL).

The water body-pollutant priorities are summarized in **Table 2**, as described in detail in the SMB JG7 WMP. Compliance deadlines associated with each of the TMDLs listed above are also presented in **Table 2**. All SMB JG7 WMP water body-pollutant combinations fall within Category 1, highest priority. No Category 2 or 3 water body-pollutant combinations were identified.

Table 2
Water Body Pollutant Priorities

Category	Water Body	Pollutant	Compliance Deadline
1: Highest Priority (Approved TMDL)	SMB Beaches	Summer dry weather bacteria	7/15/2006 (Single sample)
		Winter dry weather bacteria	7/15/2009 (Single sample)
		Wet weather bacteria	7/15/2013 (Single sample)[1]
			7/15/2013 (Geometric mean)[1, 2]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][3]
		PCBs	[No compliance deadline specified in TMDL][3]

[1] Per Resolution 2006-008, the JG7 agencies elected to pursue a non-integrated water resources approach to SMBBB TMDL compliance, which resulted in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

[2] The rolling 30-day geometric mean is calculated based on the previous 30 days. If weekly sampling is conducted, the weekly sampling result will be assigned to the remaining days of the week. The reopened 2012 TMDL, which has not yet been approved by USEPA, modified this to a weekly calculation of a rolling six week geometric mean using five or more samples, starting all calculation weeks on Sunday.

[3] Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, WLA target was set at existing waste load, so antidegradation conditions exist.

2.1.1 Santa Monica Bay Beaches Bacteria TMDL

The Santa Monica Bay beaches were designated as impaired and included on California's 1998 Clean Water Act (CWA) §303(d) list of impaired waters due to excessive amounts of coliform bacteria. The presence of coliform bacteria in surface waters is an indicator that water quality may not be sufficient to maintain the beneficial use of these waters for human body contact recreation (REC-1). In 2003, the USEPA approved the SMBBB TMDL for dry- and wet-weather conditions, the first bacteria TMDL adopted by the Regional Board in the State of California. To comply with the requirements of the TMDL, the Jurisdictional Groups developed a Coordinated Shoreline Monitoring Plan (CSMP) and began monitoring compliance sites on November 1, 2004 subsequent to Regional Board approval.

As this was the first bacteria TMDL, new approaches for regulating bacteria were developed. The SMBBB TMDL used these new approaches, including the reference beach/antidegradation approach and the corresponding exceedance day approach to expressing TMDL allocations.

In 2012, the Regional Board put forward the *Reconsideration of Certain Technical Matters for the Santa Monica Bay Beach Bacteria TMDLs; the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL; and the Los Angeles Harbor Inner Cabrillo Beach and Main Ship Channel Bacteria TMDL.* The reconsideration examined certain elements of the SMBBB TMDL, which is presented in **Table A-1**. Through the reconsideration process, winter dry-weather single sample allowable exceedance days were increased and modifications were made to the geometric mean calculation.

Table 3
Summary of Reconsideration Elements for SMBBB TMDL

TMDL	Reconsideration Items
Santa Monica Bay Beaches Dry-Weather TMDL	Re-consider TMDL to re-evaluate allowable winter dry weather exceedance days based on additional data on bacterial indicator densities in the wave wash, a reevaluation of the reference system selected to set allowable exceedance levels, and a re-evaluation of the reference year used in the calculation of allowable exceedance days.
Santa Monica Bay Beaches Wet-Weather TMDL	Refine allowable wet weather exceedance days based on additional data on bacterial indicator densities in the wave wash and an evaluation of site-specific variability in exceedance levels.
	Re-evaluate the reference system selected to set allowable exceedance levels, including a reconsideration of whether the allowable number of exceedance days should be adjusted annually dependent on the rainfall conditions and an evaluation of natural variability in exceedance levels in the reference system(s).
	Re-evaluate the reference year used in the calculation of allowable exceedance days.
	Re-evaluate whether there is a need for further clarification or revision of the geometric mean implementation provision.

The SMBBB TMDL establishes multi-part numeric targets for total coliform, fecal coliform, and enterococcus densities, reported as bacteria counts (Most Probable Number, MPN or colony forming unit, cfu) per 100 milliliters of sample. The TMDL waste load allocation (WLA), expressed as water quality-based effluent limitations (WQBELs), are based on the Los Angeles Basin Plan objectives for body-contact recreation (REC-1) as summarized in **Table 4.** Dry-weather WQBELs compliance was anticipated as of July 15, 2006 for summer dry weather, and July 15, 2009 for winter dry weather. Wet-weather compliance has been required as of July 15, 2013. This is based on Resolution 2006-008, in which the JG7 agencies elected to pursue a non-integrated water resources approach to SMBBB TMDL compliance, which resulted in a final wet weather compliance deadline of at most 10-years. Therefore, all milestones for SMB-7-6 and SMB 7-8 are currently enforceable (there are no interim targets).

Table 4
SMBBB TMDL Water Quality-Based Effluent Limitations and Receiving Water Limitations

Constituent	Daily Maximum	Rolling 30-day Geometric Mean[2]
Total coliform[1]	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.
2 The rolling 30-day geometric mean is calculated based on the previous 30 days. The reopened 2012 TMDL, which has not yet been approved by USEPA, modified this to weekly calculation of a rolling six week geometric mean using five or more sample, starting all calculation weeks on Sunday.

In addition, the 2012 reconsideration also modified the grouped final single sample bacteria RWL allowable exceedance days for beaches identified as anti-degradation beaches as summarized in **Table 5.** These new calculations were made using data collected from 2004 to 2010.

Table 5
Annual Allowable Exceedance Days of the Single Sample Objective (days)[1]

Monitoring Sites	Beach Monitoring Locations	Summer Dry-Weather (April 1 - October 31)		Winter Dry-Weather (November 1 - March 31)		Wet-Weather (Year-round)	
		Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling
SMB 7-6	Royal Palms State Beach	0	0	1	1	6	1
SMB 7-8	Wilder Annex, San Pedro	0	0	1	1	2	1

1 The final receiving water limitations are group-based and shared among all MS4 Permittees located within the sub-drainage area to each beach monitoring location.

In summary, to satisfy the monitoring requirements for the SMBBB TMDL, the two existing bacteria TMDL monitoring sites (SMB-7-06 and SMB-7-08; SMB-7-07 was destroyed in a landslide) will continue to be monitored in accordance to the Santa Monica Bay Beaches Bacteria TMDL Coordinated Shoreline Monitoring Plan (CSMP) (Technical Steering Committee 2004).

2.1.2 Santa Monica Bay Nearshore and Offshore Debris TMDL

Compliance with the SMB Debris TMDL is based on the final Numeric Target, WLA, and Load Allocation (LA), which are defined as zero trash in and on the shorelines of Santa Monica Bay, and no plastic pellets discharged from plastic manufacturers and facilities. The compliance deadline is to be achieved no later than March 20, 2020, and every year thereafter. If a Permittee adopts local ordinances to ban plastic bags, smoking in public places, and single-use expanded polystyrene food packaging by November 4, 2013, the final compliance deadline will be extended to March 20, 2023. The SMB Debris TMDL compliance is assessed in accordance with the Permittees' implementation of BMPs to address point and non-point source trash and plastic pellet abatement, and attainment of the progressive trash reductions in accordance with the TMDL compliance schedule as shown in **Table 6**.

Table 6
Santa Monica Bay Debris TMDL Compliance Schedule

Permittees	Baseline[1]	3/20/2016	3/20/2017	3/20/2018	3/20/2019	3/20/2020[2]
		Annual Trash Discharge (gals/yr)				
City of Los Angeles	25,112	20,090	15,067	10,045	5,022	0

1 If a Permittee elects not to use the default baseline, then the Permittee shall include a plan to establish a site specific trash baseline in their TMRP.
2 Permittees shall achieve their final effluent limitation of zero trash discharge for the 2019-2020 storm year and every year thereafter.

Permittees are to report their compliance strategy through the development of a Trash Monitoring and Reporting Plan (TMRP) and Plastic Pellets Monitoring and Reporting Plan (PMRP), or demonstrate that a PMRP is not required, to be approved by the Regional Board. Once the TMRP and PMRP are approved and adopted, a progress report based on installation of structural BMPs, such as full capture or partial capture systems, institutional controls, or any BMPs, is to be reported in order to calculate the reduction in the amount of trash and plastic pellets, if applicable, being discharged into Santa Monica Bay.

Each of the jurisdictions within SMB JG7 WMP Group will submit or have submitted a TMRP and PMRP. Each jurisdiction has conducted the following:

- **City of Los Angeles**: The *Trash TMDL Compliance Method: Structural Measures* was submitted in September 2011 and was adopted as the TMRP for the City of Los Angeles. A preliminary investigation of industries with standard industrial classification system (SIC) codes associated with manufacturing or use of plastic pellets within the City of Los Angeles was conducted, and it was found that no facilities were located within the City of Los Angeles for the SMB JG7 WMP Group area. The City of Los Angeles is preparing to modify the emergency/spill response plan for hazardous material to include the actions required for a spill or release of plastic pellets within its jurisdictional area.
- **LACFCD**: A PMRP was submitted on September 19, 2013 for all LACFCD within the Santa Monica Bay WMA. A TMRP was not submitted as the LACFCD does not have any land jurisdiction that generates trash.

All submitted TMRPs and PMRPs for each jurisdiction will be implemented by the corresponding jurisdiction, once approved by the Regional Board. As the SMB Debris TMDL is fulfilled through the implementation of BMPs to achieve compliance of zero trash in and on the shorelines of Santa Monica Bay, monitoring is not required if complying with the WLA. Manufacturers of plastic pellets were not identified within any of the SMB JG7 WMP Group's jurisdictional area, and monitoring for plastic pellets at the MS4 is not required. Appropriate actions for emergency spills and special circumstances for safety considerations are addressed for each jurisdiction.

2.1.3 Santa Monica Bay DDTs and PCBs TMDL

The SMB DDTs and PCBs TMDL are regulated for Santa Monica Bay from Point Dume to Point Vicente, and the Palos Verdes shelf from Point Vicente to Point Fermin. As the TMDL originates through the United States Environmental Protection Agency (USEPA), the Regional Board has been advised to implement the TMDL either through an implementation plan, NPDES permit, or other regulatory mechanisms such as State waste discharge requirements (WDRs), conditional waivers of WDRs, and/or enforcement actions. The Regional Board has decided to implement this TMDL through the MS4 Permit. Within the Permit, the WLA targets are stated in **Table 7**, which is expressed as an annual stormwater loading of pollutants to Santa Monica Bay from the LA County MS4.

Table 7
Santa Monica Bay DDTs and PCBs TMDL Waste Load Allocations

Constituent	Annual Mass-Based WLA (g/yr)[1]
Total DDT	27.08
PCBs	140.25

1 Compliance shall be determined based on a three-year averaging period. WLA is for entire LA County MS4.

The PCB and DDT TMDL states that the highest DDT and PCB loadings were from the Ballona Creek, Hermosa Beach, and Santa Monica Canyon Channel watersheds, which combined accounted for 94% of the developed area draining to Santa Monica Bay. Therefore, compliance with the WLAs for DDTs and PCBs will be assessed through monitoring conducted as part of the JG2/JG3 CIMP in Santa Monica Canyon Channel rather than sampling in the JG7 WMP Group area.

2.2 CIMP RECEIVING WATER MONITORING SITE

The primary objective of receiving water monitoring is to assess trends in pollutant concentrations over time, or during specified conditions. .

One receiving water monitoring site, SMBJ7-RW-1, is being proposed located at a transect outward from the CIMP outfall monitoring site SMBJ7-O-6, consistent with the stormwater plume during a qualifying storm event when it has been deemed safe for collection by the Captain of the boat. Single grab samples would be collected from the mixing zone in the ocean, at the nearest distance from the shoreline that the Environmental Monitoring Division boat can safely access. **Figure 5** presents the approximate location of the receiving water monitoring site for the SMB JG7 WMP Group.

Receiving water monitoring site SMBJ7-RW-1 is representative of the drainage characteristics of the SMB JG7 WMP Group area based on a linkage to the point of initial mixing from stormwater outfall SMBJ7-O-6, a representative catchment area within SMB JG7 WMP Group. The catchment area from SMBJ7-O-6, and therefore approximately from SMBJ7-RW-1, represents approximately 18% of the total SMB JG7 WMP Group area.

The JG7 WMP Group area consists solely of City of Los Angeles land. Primary land uses in the JG7 WMP Group area and the general catchment area of SMBJ7-RW-1 are residential and vacant. Given that the land uses of JG7 WMP and the catchment area are comparable, monitoring at SMBJ7-RW-1 is considered sufficiently representative of the JG7 WMP area. **Table 8** presents the land use composition of the HUC-12, the JG7 WMP area, and the catchment area of the proposed stormwater outfall SMBJ7-O-6, which is considered an approximation of the drainage area tributary to the proposed receiving water site SMBJ7-RW-1.

Table 8
Land Use Overview of Outfall Nearest to Receiving Water Monitoring Site SMBJ7-RW-1

	HUC-12		J7 WMP Area		SMBJ7-O-6	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	0.0	0.0
Education	806.2	3.3	32.2	3.4	2.8	1.7
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	21.9	13.6
SF Residential	11265.0	46.7	535.9	56.2	125.7	77.9
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	243.3	25.5	11.0	6.8
Total	24115.1	100	954.4	100	161.4	100

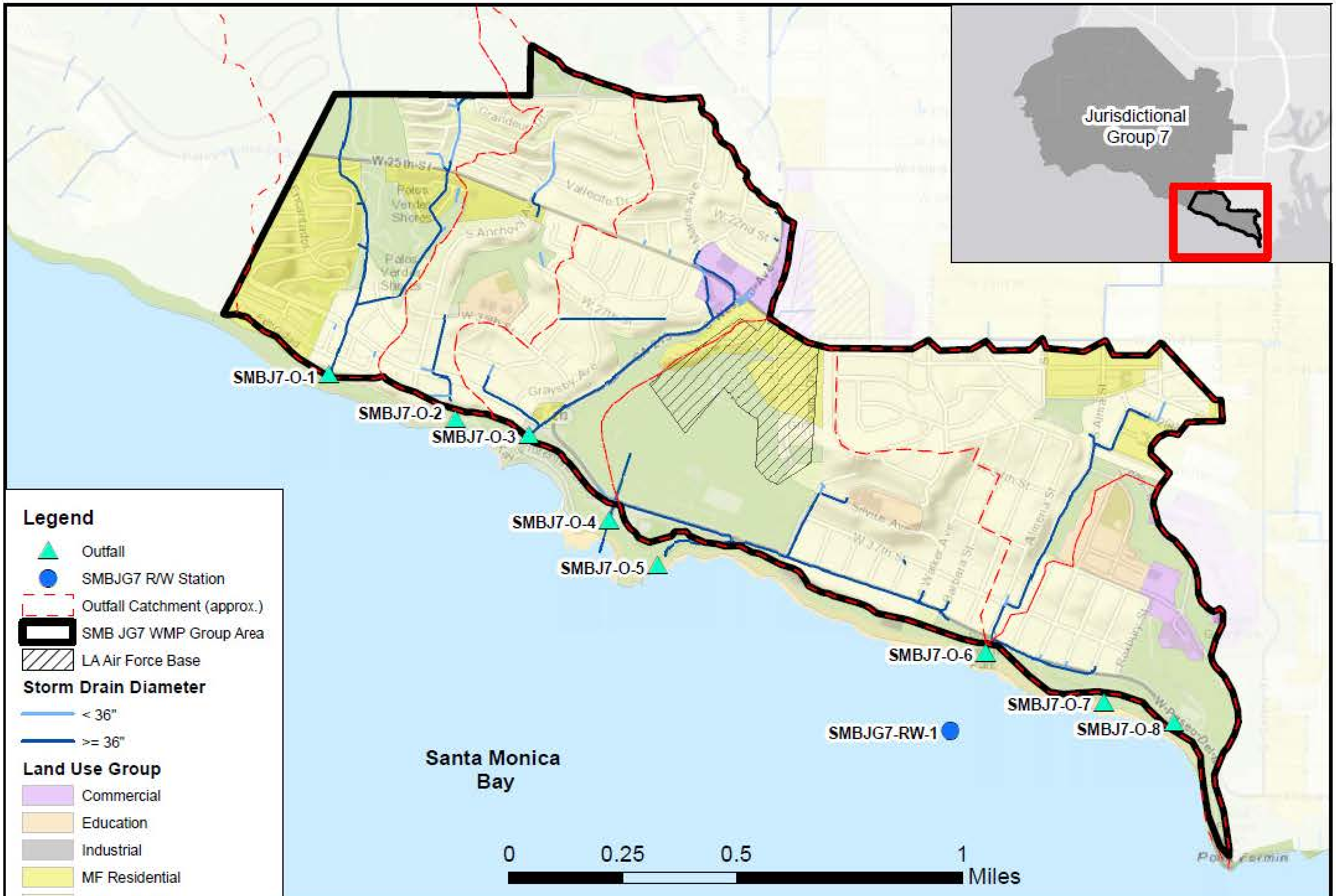


Figure 5
CIMP Monitoring Stations
SMB JG7 CIMP

June 2014

2.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION

The MRP section of the MS4 Permit identifies specific requirements for salt water (Santa Monica Bay). Wet- and dry-weather monitoring frequency, parameters, and duration will be addressed in the following sections. Parameters for monitoring were based on the MS4 Permit requirements as well as the water quality priorities as identified in the SMB JG7 WMP. Additional analytical and monitoring procedures are discussed in **Attachments B-D**. Parameters to be collected and sampling frequency to meet the receiving water monitoring requirements of the MRP are summarized in **Table 9**.

Table 9
Receiving Water Monitoring Parameters and Annual Frequency at SMBJ7-RW-1

Constituents	Wet Weather	Dry Weather
Flow and field parameters(1)	3	0
Pollutants identified in Table E-2 of the MRP	1(2)	0
Aquatic Toxicity and Toxicity Identification Evaluation (TIE)	2(3)	0
Total Coliform	1	0
E. Coli (Fecal Coliform)	1	0
Enterococcus	1	0

1 Field parameters are defined as DO, pH, temperature, salinity (due to ocean monitoring), and specific conductivity and TSS
2 Monitoring frequency only applies during the first year of monitoring during the first significant rain event. For pollutants identified in Table E-2 of the MRP that are not detected at the Method Detection Limit (MDL) or the result is below the lowest applicable water quality objective, additional monitoring will not be conducted. For pollutants detected above the lowest applicable water quality objective, future monitoring will be conducted at the frequency specified in the MRP.
3 A TIE is only required if either the survival or sublethal endpoint of the toxicity text demonstrates a percent effect value equal to or greater than 50% at the instream waste concentration.

2.3.1 Wet Weather

Wet-weather receiving water monitoring will be conducted for the duration of the MS4 permit. For SMBJ7-RW-1, the receiving water monitoring site within SMB JG7 WMP Group, wet-weather conditions will be defined as a storm event of greater than or equal to 0.1 inch of precipitation, as measured from the closest Los Angeles County controlled rain gauge within the watershed. Wet-weather monitoring will be conducted initially for all MRP Table E-2 parameters during the first significant rain event of the first year of monitoring; three times a year for flow and field parameters; and twice a year for aquatic toxicity, per Part VI.C.1.a of the MRP. For Table E-2 pollutants detected above the lowest applicable water quality objective during the first significant rain event, future monitoring of those pollutants will be conducted at the frequency specified in the MRP. Wet-weather monitoring will target the first significant rain event of the storm year. Wet-weather receiving water monitoring will be performed in close coordination with stormwater outfall monitoring to be reflective of potential impacts from MS4 discharges.

2.3.2 Dry Weather

Outfall catchment areas in the SMB JG7 WMP Group area are relatively small, ranging from less than 140 acres to approximately 370 acres. During dry weather it is unlikely that discharge from these outfalls would be of sufficient quantity to impact the Santa Monica Bay, where wet weather monitoring is conducted. Therefore, at this time no dry weather receiving water monitoring will be conducted unless triggered by the non-stormwater outfall screening program. If dry weather monitoring is triggered, it shall be conducted in the month of August, which is the historically driest month on record for the SMB J7 WMP Group area[1].

2.4 RECEIVING WATER MONITORING SUMMARY

One receiving water monitoring site, SMBJ7-RW-1, which is to be located offshore from the proposed CIMP outfall monitoring site, has been selected to meet the MRP objects for receiving water monitoring in the Santa Monica Bay for wet weather only. Receiving water monitoring will be performed from a boat in Santa Monica Bay, at a transect outward from SMBJ7-O-6, consistent with the stormwater plume. Due to the small size of the outfall catchment areas, dry weather receiving water monitoring in the Santa Monica Bay is not proposed at this time, but may be triggered in the future by the results of the non-stormwater outfall screening. The approximate location of the monitoring site is presented in **Figure 5**. A summary of constituents and monitoring frequency for the receiving water monitoring site was presented in **Table 9**. Sampling and analytical methods for receiving water monitoring is provided in **Attachments B-D**.

[1] The driest month on record was determined based on the rainfall records at the LA County DPW gauges at Palos Verdes and Torrance Airport, between 1996 and 2008.

Section 3
MS4 Infrastructure Database

To meet the requirements of Part VII of the MRP, a map(s) and/or database of the MS4 storm drains, channels, and outfalls must be submitted with the CIMP and include the following information (Part VII.A of the MRP). The SMB JG7 WMP Group has gathered for submittal as a map and/or in a database the items below with the exception of numbers 9 and 11e, which will be determined as the CIMP progresses:

1. Surface water bodies within the Permittee(s) jurisdiction
2. Sub-watershed (HUC-12) boundaries
3. Land use overlay
4. Effective Impervious Area (EIA) overlay
5. Jurisdictional boundaries
6. The location and length of all open channel and underground pipes 18 inches in diameter or greater (with the exception of catch basin connector pipes)
7. The location of all dry-weather diversions
8. The location of all major MS4 outfalls within the Permittees' jurisdictional boundary. Each major outfall shall be assigned an alphanumeric identifier, which must be noted on the map
9. Notation of outfalls with significant non-stormwater discharges (to be updated annually)
10. Storm drain outfall catchment areas for each major outfall within the Permittee(s) jurisdiction
11. Each mapped MS4 outfall shall be linked to a database containing descriptive and monitoring data associated with the outfall. The data shall include:

    a. Ownership
    b. Coordinates
    c. Physical description
    d. Photographs of the outfall, where possible, to provide baseline information to track operation and maintenance needs over time
    e. Determination of whether the outfall conveys significant non-stormwater discharges
    f. Stormwater and non-stormwater monitoring data

Figures 1 through **3** present the available database information, listed above, for the SMB JG7 WMP Group. Each year, a storm drain, channel, outfall map as well as an associated database for the SMB JG7 WMP Group are required to be updated to incorporate the most recent characterization data for outfalls with significant non-stormwater discharge. .As further investigations are conducted and additional data is collected, updates to the maps and/or database will be conducted over time. Updates to the maps and/or database will be submitted through the Annual Report.

Section 4
Stormwater Outfall Monitoring

Stormwater outfall monitoring assesses compliance with municipal action limits (MALs), WQBELs derived from TMDL WLAs, as well as the potential to cause or contribute to exceedances of RWLs derived from TMDL WLAs or receiving water quality objectives. The majority of SMB JG7 WMP Group storm drains generally drain towards Santa Monica Bay. An analysis of land use per HUC-12, drainage area and SMB JG7 WMP Group area was conducted for the monitoring site.

4.1 PROGRAM OBJECTIVES

As outlined in the Part VIII.A of the MRP, stormwater discharges from the MS4 shall be monitored at outfalls and/or alternative access points such as manholes, or in channels representative of the land uses within the Permittees' jurisdiction to support meeting the three objectives of the stormwater outfall based monitoring program:

1. Determine the quality of a Permittee's discharge relative to MALs;
2. Determine whether a Permittee's discharge is in compliance with applicable stormwater WQBELs derived from TMDL WLAs; and
3. Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

Each potential stormwater outfall monitoring site was evaluated and assessed on how representative it is of the surrounding land use of the SMB JG7 WMP Group area, jurisdictions, and the HUC-12. Each zoning category provided by the RAA guidance manual was fit into one of the following eight land use categories:

- Agricultural
- Industrial
- Single Family Residential
- Vacant/Open Space
- Commercial
- Education
- Multi-Family Residential
- Transportation

4.2 STORMWATER OUTFALL MONITORING SITE

The SMB J7 WMP area within the City of Los Angeles lies within a single HUC-12. Based on this, accessibility considerations, and its representativeness of the land use distribution within the WMP Group area, one stormwater outfall monitoring site, as shown in **Figure 5**, was selected, designated as SMBJ7-O-6, pending further evaluation for safe access.

Site SMBJ7-O-6 is located north of SMBBB TMDL monitoring location SMB-7-08. This stormwater outfall monitoring site discharges into Santa Monica Bay. The outfall is an 18-feet by 25-feet reinforced concrete box structure that, based on the GIS data, appears to be the outfall for a 66-inch diameter reinforced concrete pipe. The outfall is located near the intersection of Paseo del Mar and Almeria Street.

Runoff from SMBJ7-O-6 is solely from the City of Los Angeles. **Table 10** compares the land use composition of the SMBJ7-O-6 catchment area, HUC-12, and SMB JG7 WMP Group area. Although this table reflects the same delineation as presented for SMBJ7-RW-1, it should be noted that the area tributary to an offshore location is likely larger than the outfall delineation area. The site comprises about 17% of the drainage area of the SMB JG7 WMP Group. SMBJ7-O-6 is representative of the drainage area of the overall WMP Group area, in particular, residential and vacant/open space land uses. Based on this comparison, SMBJ7-O-6 will be a suitable outfall monitoring site to assess water quality for these land uses. It should be noted, however, that pending an accessibility review, if conditions prohibit safe access to this site another location may be selected as an alternate.

Table 10
Land Use Distribution for Catchment for Outfall Monitoring Site SMBJ7-O-6

	HUC-12		J7 WMP Area		SMBJ7-O-6	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	0.0	0.0
Education	806.2	3.3	32.2	3.4	2.8	1.7
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	21.9	13.6
SF Residential	11265.0	46.7	535.9	56.2	125.7	77.9
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant/open	5236.9	21.7	243.3	25.5	11.0	6.8
Total	24115.1	100	954.4	100	161.4	100

4.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION

The stormwater outfall monitoring site will be monitored for three (3) storm events per year, in coordination with and prior to receiving water monitoring, for all required constituents except aquatic toxicity. Aquatic toxicity will be monitored when triggered by recent receiving water toxicity monitoring, where a toxicity identification evaluation (TIE) on the observed receiving water toxicity test was inconclusive. The requirements for monitored constituents at the monitoring site are outlined in the MRP Section VIII.B.1.c and presented in **Table 11**. Parameters in Table E-2 of the MRP, as listed in **Attachment B**, will not be included as part of outfall monitoring until after the first year of receiving water monitoring if it is determined there are parameters in Table E-2 present in concentrations exceeding the applicable water quality objective in the receiving water. Monitoring for the selected site would occur for at least the duration of the Permit term, unless an alternative site is warranted, per the adaptive management process, as presented in **Section 10**. Additional analytical and monitoring procedures are discussed in **Attachment B**.

RB-AR16714

Table 11
Stormwater Outfall Monitoring Parameters and Annual Frequency at SMBJ7-O-6

Constituents	Annual Frequency
Flow, hardness, pH, dissolved oxygen, temperature, specific conductivity, and TSS	3
Table E-2 pollutants detected above relevant objectives in receiving waters[2]	3
Aquatic Toxicity and Toxicity Identification Evaluation (TIE)	(see note 1)
Total Coliform	3
E. Coli (Fecal Coliform)	3
Enterococcus	3

1. Toxicity is only monitored from outfalls when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test was inconclusive. If toxicity is observed at the outfall a TIE must be conducted.
2. Table E-2 parameters will not be tested at the outfall in the first monitoring year to allow for review of the receiving water results. If water quality objectives are exceeded in the receiving waters, then those exceeding parameters would be tested at the outfall three times annually.

Section 5
Non-Stormwater Outfall Screening and Monitoring Program

The MRP requires Permittees to implement a non-stormwater outfall-based screening and monitoring program. The Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) is focused on non-stormwater discharges to receiving waters from major outfalls.

5.1 PROGRAM OBJECTIVES

The objectives of the Non-Stormwater Program include the following (Part II.E.3 of the MRP):

a. Determine whether a Permittee's discharge is in compliance with applicable non-stormwater WQBELs derived from TMDL WLAs;
b. Determine whether a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of the MS4 Permit;
c. Determine whether a Permittee's discharge contributes to or causes an exceedance of receiving water limitations; and
d. Assist a Permittee in identifying illicit discharges as described in Part VI.D.10 of the MS4 Permit.

Additionally, the outfall screening and monitoring process is intended to meet the following objectives (Part IX.A of the MRP):

1. Develop criteria or other means to ensure that all outfalls with significant non-stormwater discharges are identified and assessed during the term of this MS4 Permit.
2. For outfalls determined to have significant non-stormwater flow, determine whether flows are the result of illicit connection/illicit discharge (IC/IDs), authorized or conditionally exempt non-stormwater flows, natural flows, or from unknown sources.
3. Refer information related to identified IC/IDs to the IC/ID Elimination Program (Part VI.D.10 of the MS4 Permit) for appropriate action.
4. Based on existing screening or monitoring data or other institutional knowledge, assess the impact of non-stormwater discharges (other than identified IC/IDs) on the receiving water.
5. Prioritize monitoring of outfalls considering the potential threat to the receiving water and applicable TMDL compliance schedules.
6. Conduct monitoring or assess existing monitoring data to determine the impact of non-stormwater discharges on the receiving water.
7. Conduct monitoring or other investigations to identify the source of pollutants in non-stormwater discharges.
8. Use results of the screening process to evaluate the conditionally exempt non-stormwater discharges identified in Parts III.A.2 and III.A.3 of the MS4 Permit and take appropriate actions pursuant to Part III.A.4.d of the MS4 Permit for those discharges that have been found to be a source of pollutants. Any future reclassification shall occur per the conditions in Parts III.A.2 or III.A.6 of the MS4 Permit.
9. Maximize the use of Permittee resources by integrating the screening and monitoring process into existing or planned Integrated Monitoring Program (IMP) and/or CIMP efforts.

5.2 NON-STORMWATER OUTFALL SCREENING AND MONITORING PROGRAM

The Non-Stormwater Program is focused on dry-weather discharges to receiving waters from major outfalls. The Program fills two roles: (1) to provide assessment of whether the non-stormwater discharges are potentially impacting the receiving water, and (2) to determine whether significant non-stormwater discharges are allowable. The Program is complimentary to the IC/ID minimum control measure.

For the SMB JG7 WMP Group area, all major outfalls will be screened prior to proceeding with dry weather monitoring. To determine whether an outfall must be monitored for non-stormwater discharges, the SMB JG7 WMP Group has developed an outfall screening and monitoring program. The sections starting with **Section 5.3** are part of the monitoring program. Within 90 days of the approval of this CIMP, the SMB JG7 WMP Group will initiate steps to identify and monitor the non-stormwater discharges. The non-stormwater outfall program will involve following steps:

1. **Outfall Screening**: The SMB JG7 WMP Group will implement a screening process to determine whether the monitoring site exhibits non-stormwater discharges and if so, if it is considered significant or if it can be excluded from further investigation. This process will include: 1) updating the outfall inventory, 2) measuring observed flows, and 3) testing for E. coli where flow is observed.
2. **Significant Non-stormwater Discharge Source Identification** (Part IX.F of the MRP): If the monitoring site exhibits significant non-stormwater discharges, the SMB JG7 WMP Group will complete source identification activities.
3. **Monitoring Non-Stormwater Discharges Exceeding Criteria** (Part IX.G of the MRP): Using the information collected during screening and source identification efforts, the SMB JG7 WMP Group will monitor the site if it has been determined to convey significant non-stormwater discharges comprised of either unknown or non-essential conditionally exempt non-stormwater discharges, or continuing discharges attributed to illicit discharges.

5.3 IDENTIFICATION OF OUTFALLS WITH SIGNIFICANT NON-STORMWATER DISCHARGES

An initial field survey was conducted for the identification of outfalls in the JG7 WMP Group area, the majority of which were observed to be corrugated metals pipes protruding from the top of rocky cliffs above rocky beaches. As described in the field survey, observation of outfalls was limited by accessibility and safety constraints. **Attachment C** presents the photos from this field survey.

Based on a review of the available information, identification of significant non-stormwater discharges is not available at this time. The SMB JG7 WMP Group will undertake a field reconnaissance to evaluate the major outfall(s), in its jurisdiction, dependent on accessibility. A major outfall for the SMB JG7 WMP Group is defined as follows:

- 36-inch or larger pipes
- 12-inch or larger pipes from industrial zoned areas

Table 12 summarizes the pertinent information for each of the outfalls in the SMB JG7 WMP Group area. As shown, six of the eight outfalls qualify as major outfalls and will be included in the non-stormwater outfall screening process, noting that accessibility and safety constraints may still limit access to these outfalls.

Table 12
Non-Stormwater Screening Sites in SMB JG7 WMP Group Area

Station ID	Type of Outlet	Outlet Size	Major Outfall?
SMBJ7-O-1	Corrugated metal pipe	84-inch diameter	Yes
SMBJ7-O-2	Corrugated metal pipe	48-inch diameter	Yes
SMBJ7-O-3(1)	Corrugated metal pipe	72-inch diameter	Yes
SMBJ7-O-4	Corrugated metal pipe	36-48-inch diameter (approx.)	Yes
SMBJ7-O-5(2)	Reinforced concrete pipe (damaged in landslide, replaced by plastic pipe)	36-inch diameter (approx.)	Yes
SMBJ7-O-6	Reinforced concrete pipe (however, appears to be reinforced concrete box at outfall)	66-inch diameter	Yes
SMBJ7-O-7(3)	Corrugated metal pipe (broken)	18-inch diameter (approx.)	No
SMBJ7-O-8	Corrugated metal pipe	18-inch diameter (approx.)	No

[1] Adjacent to SMB-7-06
[2] Adjacent to SMB-7-07
[3] Adjacent to SMB-7-08

In order to collect data to determine whether the outfalls contribute significant non-stormwater discharge, the SMB JG7 WMP Group will perform three outfall screenings for the first year after CIMP approval. The SMB JG7 WMP Group has identified *E. coli* and flow as the primary characteristic for determining significant non-stormwater discharges and will monitor for *E. coli* and flow during the three initial screening. The initial screening serves the dual purpose of data collection for completing the MS4 infrastructure database, addressed in **Section 3**, and the initial evaluation of the outfall for significant non-stormwater discharge. A standard field data collection form will be used, including information fields for:

- Channel bottom, calculated flow
- Whether discharge ponds, or reaches the receiving water
- Clarity
- Presence of odors and foam

Additionally, outstanding information for the MS4 inventory database will be collected, including, at a minimum, geographically referenced photographs.

5.4 SIGNIFICANT NON-STORMWATER DISCHARGE SOURCE IDENTIFICATION

If any outfalls are identified as producing significant non-stormwater discharges, based on flow and bacteria sampling, a source identification investigation will be conducted to identify the source(s) or potential source(s) of non-stormwater discharge.

Part IX.A.2 of the MRP requires Permittees to classify the source identification results into the following types as summarized in **Table 13**:

A. **IC/ID**: If the source is determined to be an illicit discharge, then the Permittee must implement procedures to eliminate the discharge consistent with IC/ID requirements (Permit Part VI.D.10) and document actions.

B. **Authorized or Conditionally-Exempt Non-Stormwater Discharges**: If the source is determined to be an NPDES permitted discharge, a discharge subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or a conditionally exempt essential discharge, then the Permittee must document the source. For non-essential conditionally exempt discharges, the Permittee must conduct monitoring consistent with Part IX.G of the MRP to determine whether the discharge should remain conditionally exempt or be prohibited.
C. **Natural Flows**: If the source is determined to be natural flows, then the Permittee must document the source.
D. **Unknown Sources**: If the source is unknown, then the Permittee must conduct monitoring consistent with Part IX.G of the MRP.
E. **Originates Upstream of SMB JG7 WMP Group**: If the source is determined to originate from an upstream WMA, then the Permittee must inform the upstream WMA and Regional Board in writing within 30 days of identifying the presence of the discharge, provide all available characterization data and determination efforts, and document actions taken to identify its source.

Table 13
Source Identification Types

Type	Follow-up	Action Required by Permit
A. Illicit Discharge or Connection	Refer to IC/ID program	Implement control measures and report in annual report. Monitor if cannot be eliminated.
B. Authorized or Conditionally Exempt Discharges[1]	Document and identify if essential or non-essential	Monitor non-essential discharges
C. Natural Flows	End investigation	Document and report in annual report
D. Unknown	Refer to IC/ID program	Monitor
E. Upstream of SMB JG7 WMP Group	End investigation	Inform upstream WMA and the Regional Board in writing within 30 days of identifying discharge.

1 Discharges authorized by a separate NPDES permit, a discharge subject to a Record of Decision approved by USEPA pursuant to section 121 of CERCLA, or is a conditionally exempt NSW discharge addressed by other requirements. Conditionally exempt NSW discharge addressed by other requirements are described in detail in Part III.A. Prohibitions – NSW Discharges of the Permit.

Source identification will be conducted using site-specific procedures based on the characteristics of the non-stormwater discharge. Investigations could include:

- Performing field measurements to characterize the discharge;
- Following dry-weather flows from the location where they are first observed in an upstream direction along the conveyance system; and
- Compiling and reviewing available resources, including past monitoring and investigation data, land use/MS4 maps, aerial photography, and property ownership information.

Where the source identification has determined the non-stormwater source to be authorized, natural, or essential conditionally-exempt flows, and it has been determined that the source is not causing or contributing to exceedances in the receiving water, then the outfall will require no further assessment. However, if the source identification determines that the source of the discharge is non-essential conditionally exempt, an ID, or is unknown, then further investigation will be conducted to eliminate the discharge or to demonstrate that it is not causing or contributing to receiving water impairments and will be added to the monitoring list until non-stormwater discharge is eliminated.

In some cases, source investigations may ultimately lead to prioritized programmatic or structural BMPs. Where the SMB JG7 WMP Group has determined that they will address the non-stormwater discharge through modifications to programs or by structural BMP implementation, the SMB JG7 WMP Group will incorporate the approach into the implementation schedule developed in the EWMP, and monitoring of the outfall may be discontinued.

5.5 NON-STORMWATER DISCHARGE MONITORING

As outlined in the MRP (Part II.E.3), outfalls with significant non-stormwater discharges that remain unaddressed after source investigation shall be monitored to meet the following objectives:

a. Determine whether a Permittee's discharge is in compliance with applicable dry-weather WQBELs derived from TMDL WLAs;
b. Determine whether the quality of a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of the Permit; and
c. Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

Thus, if any outfalls have been determined to convey significant non-stormwater discharges where the source identification concluded that the source is attributable to a continued ID (Type A from **Table 13)** non-essential conditionally exempt (Type B from **Table 13**), or unknown (Type D from **Table 13**) the site must be monitored. Monitoring will begin within 90 days of completing the source identification and will be coordinated with dry weather receiving water sampling efforts.

5.5.1 Monitoring Frequency, Parameters, and Duration

After the outfall screening and determination of the outfall(s) that have significant non-stormwater flows, those site(s) will be monitored. While a monitoring frequency of four times per year is specified in the Permit, it is inconsistent with the dry weather receiving water monitoring requirements. The receiving water monitoring requires two dry weather monitoring events per year. As a result, the SMB JG7 WMP Group will conduct required NSW outfall monitoring twice per year. The NSW outfall monitoring events will be coordinated with the dry weather receiving water monitoring events, which would then be triggered, to allow for an evaluation of whether the NSW discharges are causing or contributing to an observed exceedance of water quality objectives in the receiving water.

If the outfall(s) are found to be significant non-stormwater outfall(s), they will be monitored for all required constituents as outlined in Part IX.G.1.a-e of the MRP, except toxicity. Toxicity monitoring is only required when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test identified pollutants during dry weather, or where the TIE results were inconclusive. If the discharge exhibits aquatic toxicity, then a TIE shall be conducted. An overview of the constituents to be monitored and the corresponding frequency is listed in **Table 14**. The outfall(s) will be monitored for at least the duration of the Permit term, or until the non-stormwater discharge is eliminated. Additional analytical and monitoring procedures are discussed in **Attachments B-D**.

Table 14
Non-stormwater Outfall Monitoring Parameters and Annual Frequency (Year 1)

Constituent	Annual Frequency
Flow, hardness, pH, dissolved oxygen, temperature, specific conductivity, and TSS	2
Table E-2 pollutants detected above relevant objectives	2
Aquatic Toxicity and Toxicity Identification Evaluation (TIE)[1]	TBD
Total Coliform	2
E Coli (Fecal Coliform)	2
Enterococcus	2

[1] Toxicity is only monitored from outfalls when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test identified pollutants or the results of the TIE were inconclusive. If toxicity is observed at the outfall a TIE must be conducted.

5.6 NON-STORMWATER OUTFALL PROGRAM SUMMARY

The SMB JG7 WMP Group will conduct the following steps as part of the non-stormwater outfall program at all major outfalls in the SMB JG7 WMP Group area:

1. Perform the outfall screening and determine whether any major outfall has significant non-stormwater discharge (Part IX.C of the MRP);
2. Identify sources of significant non-stormwater discharges (Part IX.F of the MRP); and, if relevant
3. Continue to monitor NSW discharges which exceed the criteria (Part IX.G of the MRP).

As non-stormwater discharges are addressed, monitoring at the outfall(s) will cease. Additionally, if monitoring demonstrates that discharges do not exceed any WQBELs, then action levels or water quality standards for pollutants identified on the 303(d) list, monitoring will cease at the outfall(s) after the first year. Thus, monitoring activities have the potential to change on an annual basis.

Section 6
New Development/Re-Development Effectiveness Tracking Program

The New Development/Re-Development Effectiveness Tracking Program is used for tracking information data in regards to new and re-development activities. To meet the MRP requirements of Permit Attachment E, Part X.A, the SMB JG7 WMP Group will maintain an informational database record for each new development/re-development project subject to the MCM requirements in Part VI.D.7 of the Permit and their adopted LID Ordinance. The database should track the following information:

1. Name of the Project and Developer;
2. Mapped project location (preferably linked to the Geographic Information System (GIS) storm drain map);
3. Issuance date of the project Certificate of Occupancy;
4. 85^{th} percentile 24-hour storm event for project design (inches);
5. 95^{th} percentile 24-hour storm event for projects draining to natural water bodies (inches);
6. Other design criteria required to meet hydromodification requirements for drainages to natural water bodies;
7. Project design storm (inches per 24 hours);
8. Project design storm volume (gallons or million gallons);
9. Percent of design storm volume to be retained onsite;
10. Design volume for water quality mitigation treatment BMPs (if any);
11. If flow through, water quality treatment BMPs are approved, provide the one-year, one-hour storm intensity as depicted on the most recently issued isohyetal map published by the Los Angeles County Hydrologist;
12. Percent of design storm volume to be infiltrated at an off-site mitigation or groundwater replenishment project site;
13. Percent of design storm volume to be retained or treated with biofiltration at an off-site retrofit project;
14. Location and maps (preferably linked to the GIS storm drain map) of off-site mitigation, groundwater replenishment, or retrofit sites; and
15. Documentation of issuance of requirements to the developer.

Until the WMP is approved by the Regional Board or the Executive Officer, the SMB JG7 WMP Group is only required to implement and track MCM information in its existing stormwater management program per Part V.C.4.d.i.

In addition to the requirements in Part X.A of the MRP, Part VI.D.7.d.iv of the Permit requires that the SMB JG7 WMP Group implement a tracking system for new development/re-development projects that have been conditioned for post-construction BMPs. The following information is to be tracked using GIS or another electronic system:

1. Municipal Project ID
2. State Waste Discharge Identification (WDID) Number
3. Project Acreage
4. BMP Type and Description
5. BMP Location (coordinates)
6. Date of Acceptance

7. Date of Maintenance Agreement
8. Maintenance Records
9. Inspection Date and Summary
10. Corrective Action
11. Date Certificate of Occupancy Issued
12. Replacement or Repair Date

6.1 PROGRAM OBJECTIVES

The objective of the New Development/Re-Development Effectiveness Tracking is to assess whether post-construction BMPs, as outlined in permits issued by the Permittees, are implemented, and to ensure the volume of stormwater associated with the design storm is retained onsite, as required by Part VI.D.7.c.i. of the Permit. The New Development/Re-Development Effectiveness Tracking will gather necessary data to assess whether construction MCM, LID ordinances and BMPs are effective and being implemented.

6.2 EXISTING NEW DEVELOPMENT/RE-DEVELOPMENT TRACKING PROCEDURES

The City of Los Angeles has an established process of tracking some or the entire 27 required development program tracking elements (15 elements identified in Attachment E.X.A and 12 elements in Part VI.D.7.d.iv.).

6.3 SPECIAL CONSIDERATIONS FOR DATA MANAGEMENT AND REPORTING

A fundamental step in establishing individual data management protocols consists of developing a recommended standard operating procedure (SOP) and determining the responsible person within each City department for collecting, reviewing, and reporting the data. The SOP developed by the City of Los Angeles will consist of written instructions regarding documentation of routine activities and delineation of the primary steps in the land development approval process, relevant data generated at each step, and procedures for "handoff" of the project to the next group. Development and use of an SOP is an integral part of successful data management as it provides information to perform a task properly, and facilitates consistency in the quality and integrity of the tracking data.

6.3.1 Data Management

The City will conduct tracking to meet Permit requirements and facilitate reporting. The data management protocols will include:

- Designing and testing data entry sheets for the required information fields identified in **Section 6.1**;
- Describing the procedures and identifying the persons responsible for inputting data, assessing accuracy and consistency, and coordinating follow up actions when questions arise;
- Strategy for checking and validating data entry, including identifying persons responsible for managing and safeguarding data, performing data entry, supervising the data entry, and ensuring quality control of the data; and
- Specifying procedures for routinely and safely archiving data files.

Data collection for development review processes generally consist of the following similar steps:

- **Planning**: Project proponents submit an application to agency planning department to determine whether or not the project meets jurisdictional requirements. When required, the project may require a public hearing for conditions and entitlements. Project conditions may include water quality related requirements.
- **Building**: Projects may be conditioned subject to engineering, community services, or building department review and approval of plans or technical reports. During review, required water quality BMP designs are reviewed and accepted. When a building and/or grading permit is issued, project construction usually proceeds without further discretionary approvals.
- **Construction**: During construction, approved BMPs are implemented and then verified by the jurisdiction's inspector prior to issuance of a Certificate of Occupancy.
- **Post-Construction Inspections**: Once constructed, inspection and verification of maintenance is transferred to the jurisdiction's water quality program manager.

Relevant project data is collected during each phase of the development review process described above. Based on this general process and information gathered through the questionnaire, **Table 15** illustrates data collection opportunities throughout the planning, building, construction, and post-construction inspection processes for requirements in Part VI.D.7 of the Permit.

Table 15
Development Review Process and Data Collection

Stage	Process	Data Collection Opportunity
Planning	Planning review, conditions, and entitlements	Project name
		Developer name
		Location/Map
		Documentation of issuance of requirements
Building	Engineering review and approval of plans and technical reports	85th and 95th percentile storm event criteria
		Other hydromodification management requirements
		Project design storm intensity and volume
		Percent of design storm volume retained onsite
		Design volume for treatment BMPs
		One year/one hour storm intensity
		Percent of design storm infiltrated offsite
		Percent of design storm retained/treated with biofiltration offsite
		Location/Maps of offsite mitigation
Construction	Approval of BMP construction and issuance of Certificate of Occupancy	Issuance date of Certificate of Occupancy
Post-Construction Inspections	Inspection and tracking of post-construction BMPs	Inspection and maintenance dates

6.3.2 Additional Data

To facilitate annual assessment and reporting and future Reasonable Assurance Analyses (RAA) input data compilation, the SMB JG7 WMP Group may also track the following questions and/or information:

- Do any modified MCMs apply to this project?

RB-AR16724

- Assessor's Identification Number (AIN)
- Street address
- Revised land use (based on City/County Land Use Categories)
- BMP maintenance funding source
- Tributary area to each BMP

6.3.3 Reporting

Development of a data collection template and established SOPs will aid in future analyses and annual reporting. The example data collection template, presented in **Table 16**, includes the information to be tracked for each project.

Table 16
Example Data Collection Template

PLANNING									
Project Name / Description	New or Re-Development	Planning ID	Name of Developer	Assessor's Identification Number (AIN)	Location (Lat/Long or Cross Streets)	Address	City	Zip	Issuance of Requirements Date
ABC Development	*New Development*	*PA14-0001*	*XYZ Development, LLC*	*4272-029-017*	*Paseo Del Mar and Almeria Street 33.711563, -118.303522*	*1234 Paseo Del Mar*	*Los Angeles*	*90731*	*3/11/2014*

Required	= Required Field
Recommended	= Recommended

BUILDING																			
Building ID	Project Acreage (Acres)	Design Storm (in/24 hr)	Design Storm Volume (Gallons or MGD)	Units	Storm Volume Retained On-site (%)	85th % Storm Event (in/24 hr)	95th % Storm Event - Projects Draining to Natural Water Bodies (in/24 hr)	Type of BMP (Please select from list)	BMP Location (Lat/Long or Coordinates)	Contributing Area (Acres)	Design Volume for Treatment BMPs	Units	Offsite Run-on / Mitigation	Offsite Run-on Location	Design Storm Volume - Infiltrated at an Off-Site Mitigation Project (%)	Design Storm Volume - Retained or Treated with Biofiltration Off-Site (%)	Date of Maintenance Agreement	State WDID #
B14-0001	*18.943*	*0.920*	*473,200*	*Gallons*	*100%*	*0.920*	*None*	*(Bio)Infiltration Basins*	*34.012711, 118.271411*	*5.540*	-		*No*	*None*	*0.00%*	*0.00%*	*11/15/2014*	*4 19C123456*
								Permeable Pavement	*34.012311, 118.272411*	*3.400*	-				*0.00%*	*0.00%*		
								Water Harvesting	*34.012311, 118.271411*	*2.400*	-				*0.00%*	*0.00%*		
								Media Filtration Practices	*34.012511, 118.271411*	*2.103*	*6722*	*cf*			*0.00%*	*0.00%*		
								Wet Detention	*34.012811, 118.271811*	*5.500*	-				*0.00%*	*0.00%*		

CONSTRUCTION		POST-CONSTRUCTION BMP INSPECTIONS			
Acceptance Date	Certificate of Occupancy Date	Maintenance Records	Inspection Date and Summary	Replacement or Repair Date	Corrective Action
11/5/2016	*11/15/2016*	*Yes*	*11/21/2017*	*None*	*No*
		No	*11/21/2018 - No Records*	*Unknown*	*Yes*
		Yes	*11/21/2019*	*None*	*No*
		Yes	*11/21/2020*	*None*	*No*
		Yes	*11/21/2021*	*None*	*No*

Annual Assessment and Reporting requirements to be included in an Annual Report are outlined in Part XVIII.A.1 through A.7 of the MRP. With regard to New Development/Re-Development Effectiveness Tracking, the SMB JG7 WMP Group is required to annually track, analyze, and report on the following stormwater control measures in Part XVIII.A.1:

- Estimate the cumulative change in percent effective impervious area (EIA) since the effective date of the Permit and, if possible, the estimated change in the stormwater runoff volume during the 85th percentile storm event.
- Summarize new development/re-development projects constructed within the Permittee's jurisdictional area during the reporting year.
- Summarize retrofit projects that reduced or disconnected impervious area from the MS4 during the reporting year.
- Summarize other projects designed to intercept stormwater runoff prior to discharge to the MS4 during the reporting year.
- For the projects summarized above, estimate the total runoff volume retained onsite by the implemented projects.
- Summarize actions taken in compliance with TMDL implementation plans or approved Watershed Management Programs to implement TMDL provisions in Part VI.E and Attachments L-R of the Permit.
- Summarize riparian buffer/wetland restoration projects completed during the reporting year. For riparian buffers include width, length and vegetation type; for wetland include acres restored, enhanced, or created.
- Summarize other MCMs implemented during the reporting year, as deemed relevant.
- Provide status of all multi-year efforts that were not completed in the current year and will therefore continue into the subsequent year(s). Additionally, if any of the requested information cannot be obtained, then the Permittee shall provide a discussion of the factor(s) limiting its acquisition and steps that will be taken to improve future data collection efforts.

Group members are also required to track, evaluate, and provide an effectiveness assessment of stormwater control measures per Attachment E, Part XVIII.A.2:

- Summarize rainfall for the reporting year. Summarize the number of storm events, highest volume event (inches/24 hours), highest number of consecutive days with measureable rainfall, total rainfall during the reporting year compared to average annual rainfall for the subwatershed. Precipitation data may be obtained from the LACDPW rain gauge stations available at http://www.ladpw.org/wrd/precip/.
- Provide a summary table describing rainfall during stormwater outfall and wet-weather receiving water monitoring events. The summary description shall include the date, time that the storm commenced and the storm duration in hours, the highest 15-minute recorded storm intensity (converted to inches/hour), the total storm volume (inches), and the time between the storm event sampled and the end of the previous storm event.
- Where control measures were designed to reduce impervious cover or stormwater peak flow and flow duration, provide hydrographs or flow data of pre- and post-control activity for the 85th percentile, 24-hour rain event, if available.
- For natural drainage systems, develop a reference watershed flow duration curve and compare it to a flow duration curve for the subwatershed under current conditions.
- Provide an assessment as to whether the quality of stormwater discharges as measured at designed outfalls is improving, staying the same, or declining. The Permittee may compare water quality data from the reporting year to previous years with similar rainfall patterns, conduct

trends analysis, or use other means to develop and support its conclusions (e.g., use of non-stormwater action levels or municipal action levels as provided in Attachment G of the Permit).
- Provide an assessment as to whether wet-weather receiving water quality within the jurisdiction of the Permittee is improving, staying the same, or declining when normalized for variations in rainfall patterns. The Permittee may compare water quality data from the reporting year to previous years with similar rainfall patterns, conduct trends analysis, draw from regional bioassessment studies, or use other means to develop and support its conclusions.
- Provide status of all multi-year efforts, including TMDL implementation, that were not completed in the current year and will continue into the subsequent year(s). Additionally, if any of the requested information cannot be obtained, then the Permittee shall provide a discussion of the factor(s) limiting its acquisition and steps that will be taken to improve future data collection efforts.

Additional reporting elements required are identified in Part VI.D.7 of the Permit and include:

- A summary of total offsite project funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite projects.
- A list of mitigation project descriptions and estimated pollutant and flow reduction analyses.
- A comparison of the expected aggregate results of alternative compliance projects to the results that would otherwise have been achieved by retaining onsite the stormwater quality design volume.

Part XV.A of the MRP requires each Permittee or group to submit an Annual Report to the Regional Board by December 15th of each year. The annual reporting period is from July 1st through June 30th, and information reported will cover approved and constructed projects that have been issued occupancy.

6.4 SUMMARY OF NEW DEVELOPMENT/RE-DEVELOPMENT EFFECTIVENESS TRACKING

New Development/Re-Development Effectiveness Tracking is used for tracking information data in regards to new and re-development activities and their associated post-construction BMPs. The information is stored and will be submitted in an annual compliance report.

The City has developed mechanisms for tracking new development/re-development projects that have been conditioned for post-construction BMPs pursuant to MS4 Permit Part VI.D.7 The City has also developed mechanisms for tracking the effectiveness of these BMPs pursuant to MS4 Permit Attachment E.X.

Section 7
Regional Studies

As stated earlier, the MRP identifies one regional study: the SMC Regional Watershed Monitoring Program. The goal of the program is to conduct ongoing, large-scale regional monitoring on coastal streams and rivers. However, since there are no streams or rivers in the SMB JG7 WMP Group area, there are no SMC monitoring sites located in the WMP Group area.

Regardless, the City of Los Angeles and the LACFCD will continue to participate in the Regional Watershed Monitoring Program (Biosassessment Program) being managed by the Southern California Stormwater Monitoring Coalition (SMC). Initiated in 2008, the SMC's Regional Bioassement Program is designed to run over a five-year cycle. Monitoring under the first cycle concluded in 2013, with reporting of findings and additional special studies planned to occur in 2014. The SMC, including the SMB JG7 WMP Group agencies, is currently working on designing the bioassessment monitoring program for the next five-year cycle, which is scheduled to run from 2015 to 2019.

SCCWRP's Bight Regional Monitoring program is also expected to continue. Among other focuses, this program assesses the health of the Southern California Bight with respect to offshore water quality.

Section 8
Special Studies

The MRP requires each Permittee to be responsible for conducting special studies required in an effective TMDL or an approved TMDL Monitoring Plan. The effective TMDLs, revised TMDLs, and approved monitoring plans relevant to the SMB JG7 WMP Group do not require the completion of special studies. However, the SMB DDT and PCB TMDL has identified optional special studies as follows:

- Refine the relationship between sediment and concentrations of pollutants and fish tissue contamination;
- Determine total mass of DDT and PCBs in Santa Monica Bay subsurface sediments through sediment coring profiles;
- Identify flux rate of pollutants from the sediments to the water column; and
- Evaluate sediments embedded in storm drains to better estimate potential loadings of DDT and PCBs to Santa Monica Bay and identify potential sources.

At this time, the SMB JG7 WMP Group will not participate in any special studies. At a future date, if implementation of a special study is desirable, then a separate work plan that coordinates with the CIMP will be developed.

Section 9
Non-Direct Measurements

Existing monitoring programs that collect water quality data in the watershed, as identified in Section 2.1, will be incorporated into the CIMP database to the extent practicable. Gathering and compiling information from outside the CIMP programs will be dictated by the cost. Water quality data reported by these monitoring programs will be evaluated for suitability for inclusion in the CIMP database. If the water quality data is deemed to be suitable, then it will be included in the database.

Section 10
Adaptive Management

An adaptive management approach provides a structured process that allows for taking action under uncertain conditions based on the best available science, closely monitoring and evaluating outcomes, and re-evaluating and adjusting decisions as more information is obtained.

The WMP and CIMP are to be implemented using the adaptive process. As new program elements are implemented and data gathered over time, the WMP and CIMP will undergo revision to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP and CIMP will employ an adaptive management process that will allow the two programs to evolve over time.

10.1 INTEGRATED MONITORING AND ASSESSMENT PROGRAM

Part XVIII.A of the MRP details the annual assessment and reporting that is required as part of the annual report. The annual assessment and reporting is composed of seven parts:

1. Stormwater Control Measures
2. Effectiveness Assessment of Stormwater Control Measures
3. Non-stormwater Control Measures
4. Effectiveness Assessment of Non-stormwater Control Measures
5. Integrated Monitoring Compliance Report
6. Adaptive Management Strategies
7. Supporting Data and Information

Based on the findings of the annual assessment, revisions to the CIMP will be included as part of the Integrated Monitoring Compliance Report (IMCR), which is further outlined in **Section 11.2**, and submitted as part of the annual report.

10.2 CIMP REVISION PROCESS

Implementation of the CIMP will be used to gather data on receiving water conditions and stormwater/non-stormwater quality to assess water quality and the effectiveness of the WMP. As part of the adaptive management process, re-evaluation of the CIMP will need to be conducted to better inform the SMB JG7 WMP Group of ever-changing conditions of the watershed. Each program of the CIMP will be re-evaluated every two years, in line with the WMP's adaptive management process, for the following:

- **Monitoring Site Locations**: As water quality priorities change and certain WBPCs are being address or identified, monitoring site locations will either need to be added or changed.
- **Monitoring Constituents**: Eliminate or reduce monitoring of certain constituents if constituents were not initially detected during initiation of the CIMP and are not being addressed by a watershed control measure.
- **Monitoring Frequency**: Increase or decrease monitoring frequency based on the evaluation of RWL, WQBELs, and non-stormwater action levels.

Based on the re-evaluation, CIMP revisions will be made and submitted to the Regional Board for approval. CIMP revisions will be implemented upon approval by the Regional Board or within 60 days of submittal if the Regional Board expresses no objections.

Section 11
Reporting

Analysis and reporting of data is an integral part of verifying whether the CIMP is meeting MRP objectives. The MRP, establishes NPDES permit monitoring, reporting, and recordkeeping requirements, including those for large MS4s, based on federal Clean Water Act (CWA) section 308(a) and Code of Federal Regulations (40 CFR) sections 122.26(d)(2)(i)(F), (iii)(D), 122.41(h)-(l), 122.42(c), and 122.48. In addition, California Water Code (CWC) section 13383 authorizes the Regional Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The following sections outline the CIMP reporting process for the SMB JG7 WMP Group.

11.1 DOCUMENTS AND RECORDS

Consistent with the Part XIV.A of the MRP requirements, the SMB JG7 WMP Group will retain records of all monitoring information for a period of at least 3 years from the date of the sample, measurement, report, or application, including:

- Calibration data;
- Major maintenance records;
- Original lab and field data sheets;
- Original strip chart recordings for continuous monitoring instrumentations;
- Copies of reports required by the permit; and
- Records of data used to complete the application for the permit.

Records of monitoring will include:

- Date, time of sampling or measurements, exact place, weather conditions, and rainfall amount;
- Individual(s) who performed the sampling or measurements;
- Date(s) analyses were performed;
- Individual(s) who performed the analyses;
- Analytical techniques or methods used;
- Results of such analyses; and
- Data sheets showing toxicity test results.

11.1.1 Semi-Annual Data Submittal

Monitoring results data will be submitted semi-annually, as stated in Part XIV.L of the MRP. The transmitted data will be in the most recent update of the Southern California Municipal Storm Water Monitoring Coalition's (SMC) Standardized Data Transfer Formats (SDTFs) and sent electronically to the Regional Board Stormwater site to MS4stormwaterRB4@waterboards.ca.gov. The SMC SDTFs can be found at the SCCWRP web page http://www.sccwrp.org/data/DataSubmission.aspx. The submitted monitoring data will highlight exceedances of applicable WQBELs, receiving water limitations, action levels, and/or aquatic toxicity thresholds for all test results, with corresponding sampling dates per receiving water monitoring station.

11.1.2 Annual Monitoring Reports

Part XVIII.A.5, of the MRP presents the requirements of the IMCR that will be included and submitted on an annual basis as part of the Annual Report. As discussed in **Section 10**, the IMCR is one of seven parts of the Annual Assessment and Reporting.

The IMCR will include the following information as required by the MRP:

- Summary of exceedances against all applicable RWLs, WQBELs, non-stormwater action levels, and aquatic toxicity thresholds for:
    - Receiving water monitoring – Wet- and dry-weather
    - Stormwater outfall monitoring
    - Non-stormwater outfall monitoring
- Summary of actions taken:
    - To address exceedances for WQBELs, non-stormwater action levels, or aquatic toxicity for stormwater and non-stormwater outfall monitoring
    - To determine whether MS4 discharges contributed to RWL exceedances and efforts taken to control the discharge causing the exceedances to the receiving water
- If aquatic toxicity was confirmed and a TIE was conducted, then identify the toxic chemicals determined by the TIE, and include all relevant data to allow the Regional Board to review the adequacy and findings of the TIE.

The IMCR will be submitted, as part of the Annual Assessment Report section of the Annual Report, to the Regional Board by December 15th of each year covering the preceding reporting year from July 1 through June 30th, for at least the duration of the Permit term.

11.1.3 Signatory and Certification Requirements

Part V.B of Attachment D of the Permit presents the Signatory and Certification Requirements and states:

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or US Environmental Protection Agency (USEPA) shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below [40 CFR section 122.41(k)(1)].
2. All applications submitted to the Regional Water Board shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer includes: (i) the chief executive officer of the agency (e.g., Mayor), or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., City Manager, Director of Public Works, City Engineer, etc.).[40 CFR section 122.22(a)(3)].
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above [40 CFR section 122.22(b)(1)];
    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named

individual or any individual occupying a named position.) [40 CFR section 122.22(b)(2)]; and

c. The written authorization is submitted to the Regional Water Board [40 CFR section 122.22(b)(3)].

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR section 122.22(c)].
5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared 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 fine and imprisonment for knowing violations." [40 CFR section 122.22(d)].

All required signatures and statements will be included as an attachment of the Annual Report, which will be submitted to the Regional Board by December 15th of each year, for at least the duration of the Permit term.

Section 12
Schedule for CIMP Implementation

As stated in Part IV.C.6 of the MRP, the SMB JG7 WMP Group's CIMP will initiate 90 days after approval by the Executive Officer of the Regional Board. CIMP monitoring will be implemented in a phased-in approach to allow sufficient time for permitting and installation of equipment for all monitoring sites. Established TMDL monitoring programs, specifically the SMBBB TMDL 2004 approved CSMP, will continue without modification.

Section 13
References

California Department of Fish and Wildlife. Ecosystem Restoration Program, Adaptive Management https://www.dfg.ca.gov/erp/adaptive_management.asp. April 2014.

California Regional Water Quality Control Board, Los Angeles Region, *Order No. R4-2012-0175 NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating From The City of Long Beach MS4.* November 2012.

California Regional Water Quality Control Board, Los Angeles Region, *Santa Monica Bay Nearshore and Offshore Debris TMDL*, October 2010.

City of Los Angeles, Environmental Monitoring Division, *Santa Monica Bay Shoreline Monitoring Municipal Separate Storm Sewer System (MS4) Report (June 1, 2011 – May 30, 2012)*, 2012.

Cowgill, U.M. and D.P. Milazzo. 1990. The sensitivity of two cladocerans to water quality variables, salinity and hardness. Arch. Hydrobiol. 120:185–196.

Kayhanian, M., C. Stransky, S. Bay, S. Lau, M.K. Stenstrom. 2008. Toxicity of urban highway runoff with respect to sorm duration. Science of the Total Environment 389:109-128

Lee, G. F. and A. Jones-Lee. "Review of the City of Stockton Urban Stormwater Runoff Aquatic Life Toxicity Studies Conducted by the CVRWQCB, DeltaKeeper and the University of California, Davis, Aquatic Toxicology Laboratory between 1994 and 2000," Report to the Central Valley Regional Water Quality Control Board, G. Fred Lee & Associates, El Macero, CA, October (2001).

Los Angeles RWQCB, *Attachment A to Resolution No. 2002-022 Final – 12/12/02 1 Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate Implementation Provisions for the Region's Bacteria Objectives and to incorporate the Santa Monica Bay Beaches Wet-Weather Bacteria TMDL*, 2002.

Los Angeles RWQCB, *Draft Santa Monica Bay Beaches Bacteria TMDL, Revised Staff Report (Dry Weather Only).* http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/2002-004/02_0114_tmdl%20Dry%20Weather%20Only_web.pdf, January 2002.

Los Angeles RWQCB, *Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 02-004*. http://63.199.216.6/larwqcb_new/bpa/docs/2002-004/2002-004_RB_BPA.pdf, 2002b.

Los Angeles RWQCB, *Water Quality in the Santa Monica Bay Watershed Under the Surface Water Ambient Monitoring Program Fiscal Year 2001-2002*, 2005.

Los Angeles RWQCB, *Proposed Amendments to the Water Quality Control Plan – Los Angeles Region for the Santa Monica Bay Nearshore and Offshore Debris TMDL. Attachment A to Resolution*

No. R10-010. Adopted November 4, 2010. http://63.199.216.6/larwqcb_new/bpa/docs/R10-010/R10-010_RB_BPA.pdf, November 2010.

Los Angeles RWQCB, *Water Quality Control Plan, Los Angeles Region.* http://www.waterboards.ca.gov/rwqcb4/ water_issues/programs/basin_plan/index.shtml, 1995, updated 2011.

Palumbo, A., Fojut, T., TenBrook, P. and Tjerdeema, R. 2010a. Water Quality Criteria Report for Diazinon. Prepared for the Central Valley Regional Water Quality Control Board by the Department of Environmental Toxicology, University of California, Davis. March.

Palumbo, A., Fojut, T., Brander, S., and Tjerdeema, R. 2010b. Water Quality Criteria Report for Bifenthrin. Prepared for the Central Valley Regional Water Quality Control Board by the Department of Environmental Toxicology, University of California, Davis. March.

Southern California Coastal Water Research Project, *Bight'13 Contaminant Impact Assessment Field Operations Manual - Appendix A*, 2013 http://www.sccwrp.org/Documents/BightDocuments/Bight13Documents/Bight13PlanningDocuments.aspx.

Technical Steering Committee of the City of Los Angeles and County of Los Angeles, Co-Chairs, *Santa Monica Bay Beaches Bacterial TMDLs Coordinated Shoreline Monitoring Plan*, 2004

United States Environmental Protection Agency (USEPA). 1991. Methods for Aquatic Toxicity Identification Evaluations: Phase I. Toxicity Characterization Procedures. 2nd Edition. EPA-600-6-91-003. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1992. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. EPA/600/6-91/005F. May 1992. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1993a. Methods for Aquatic Toxicity Identification Evaluations- Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA-600-R-92-080. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1993b. Methods for Aquatic Toxicity Identification Evaluations- Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA-600-R-92-081. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA-600-R-95-136. August.

U.S. Environmental Protection Agency (USEPA). 1996. Marine toxicity identification evaluation (TIE): Phase I guidance document. EPA/600/R-96/054. National Health and Environmental Effects Research Laboratory. Narragansett, RI.

U.S. Environmental Protection Agency (USEPA). 1996a. Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels. July 1996.

United States Environmental Protection Agency (USEPA). 2002a. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. October. EPA-821-R-02-013.

United States Environmental Protection Agency (USEPA). 2002b. Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. October. EPA-821-R-02-012.

United States Environmental Protection Agency (USEPA), Region 2, 2004, *Guidance for the Development of Quality Assurance Project Plans for Environmental Monitoring Projects*. April 12, 2004

United States Environmental Protection Agency (USEPA). 2007. Sediment toxicity identification evaluation (TIE) phases I, II, and III guidance document. EPA/600/R-07/080. U.S. Environmental Protection Agency, Office of Research and Development, Atlantic Ecology Division. Narragansett, RI.

United States Environmental Protection Agency (USEPA) 2009, New England, *Quality Assurance Project Plan Guidance for Environmental Projects Using Only Existing (Secondary) Data.* October 2009

United States Environmental Protection Agency (USEPA). 2010. National Pollutant Discharge Elimination System Test of Significant Toxicity Technical Document. EPA/833-R-10-004, U.S. Environmental Protection Agency, Office of Environmental Management, Washington, DC.

United States Environmental Protection Agency (USEPA), Region IX, 2013, *Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs.* March 2013

Wheelock, C., Miller, J., Miller, M., Gee, S., Shan, G. and Hammock, B. 2004. Development of Toxicity Identification Evaluation (TIE) procedures for pyrethroid detection using esterase activity. Environmental Toxicology and Chemistry 23:2699-2708

Attachment A

LACFCD Background Information

In 1915, the Los Angeles County Flood Control Act was adopted by the California State Legislature after a disastrous regional flood took a heavy toll on lives and property. The 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, protects existing vegetal covers, collects surface storm water from streets, and replenishes groundwater with storm water 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 1.**

By statute, the LACFCD has limited powers and purposes, which places constraints on the types of projects and activities which the LACFCD may fund. 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 Permit for inspecting and controlling pollutants from industrial and commercial facilities, development projects, and development construction sites. (Permit, Part II.E, p. 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."
(Permit, Part II.F**,** p. 18.)

Consistent with the role and responsibilities of the LACFCD under the Permit, the E]WMPs and 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.

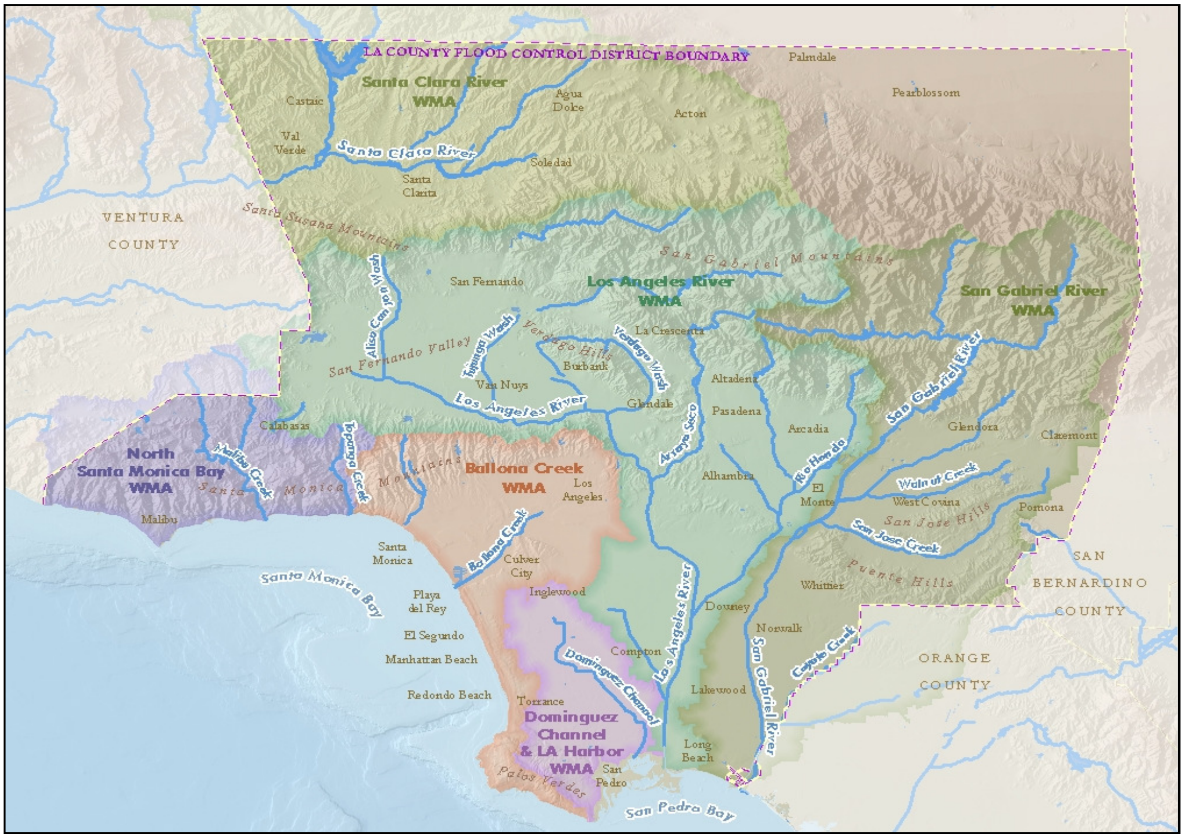


Figure 1
Los Angeles County Flood Control District Service Area

Attachment B

Analytical and Monitoring Procedures

Section 1
Analytical Procedures

The sections below discuss the analytical procedures for data generated in the field and in the laboratory.

1.1 Field Parameters

Field meters will be calibrated in accordance to **Section 2.1.3**. Portable field meters will measure field parameters within specifications outlined in **Table B-1.**

Table B-1
Analytical Methods and Project Reporting Limits for Field Parameters

Parameter	Method	Range	Project RL
Current velocity/flow	Electromagnetic	-0.5 to +20 ft/s	0.05 ft/s
pH	Electrometric	0 – 14 pH units	NA
Temperature	High stability thermistor	-5 – 50 oC	NA
Dissolved oxygen	Membrane or Optical	0 – 50 mg/L	0.5 mg/L
Turbidity	Nephelometric	0 – 3000 NTU	0.2 NTU
Conductivity	Graphite electrodes	0 – 10 mmhos/cm	2.5 umhos/cm
Salinity	TBD	TBD	1 ppt

RL – Reporting Limit NA – Not applicable

1.2 Analytical Methods and Method Detection and Reporting Limits

Method detection limits (MDL) and reporting limits (RLs) must be distinguished for proper understanding and data use. The MDL is the minimum analyte concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. The RL represents the concentration of an analyte that can be routinely measured in the sampled matrix within stated limits and with confidence in both identification and quantitation.

Under this monitoring program, RLs must be verifiable by having the lowest non-zero calibration standard or calibration check sample concentration at or less than the RL. RLs have been established in this CIMP based on the verifiable levels and general measurement capabilities demonstrated for each method. These RLs should be considered as maximum allowable RLs to be used for laboratory data reporting. Note that samples diluted for analysis may have sample-specific RLs that exceed these RLs. This will be unavoidable on occasion. However, if samples are consistently diluted to overcome matrix interferences, the analytical laboratory will be required to notify the SMB JG7 WMP Group regarding how the sample preparation or test procedure in question will be modified to reduce matrix interferences so that project RLs can be met consistently.

Analytical methods and RLs required for samples analyzed in the laboratory are summarized in **Table B-2** for analysis in water. For organic constituents, environmentally relevant detection limits will be used to the extent practicable. The RLs listed in **Table B-2** are consistent with the requirements of the available minimum levels provided in the MRP, except for total dissolved solids, which was set equal to the minimum level identified in the California State Water Resources Control Board's Surface Water Ambient Monitoring Program's (SWAMP) Quality Assurance Project Plan. Alternative methods with

RLs that are at or below those presented in **Table B-2** are considered equivalent and can be used in place of the methods presented in **Table B-2** .

Prior to the analysis of any environmental samples, the laboratory must have demonstrated the ability to meet the minimum performance requirements for each analytical method presented in **Table B-2**. Depending on the laboratory selected for analysis, analytical methods may change, retaining the required minimum RL. The initial demonstration of capability includes the ability to meet the project RLs, the ability to generate acceptable precision and accuracy, and other analytical and quality control parameters documented in this CIMP. Data quality objectives for precision and accuracy are summarized in **Table B-3.**

Table B-2
Analytical Methods and Project Reporting Limits (RL) for Laboratory Analysis of Water Samples

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Toxicity				
Ceriodaphnia dubia (Freshwater)	EPA-821-R-02-013 (1002.0) and EPA-821-R-02-012 (2002.0)	TUc	2	NA
Strongylocentrotus purpuratus (marine waters)	EPA-600-R-95-136 (1002.0)	TUc	2	NA
Haliotis rufescens (marine waters)	EPA-600-R-95-136	TUc	2	NA
Bacteria				
Total coliform (marine waters)	SM 9221	MPN/100mL	10	10,000
Enterococcus (marine waters)	SM 9230	MPN/100mL	10	104
Fecal coliform (marine and fresh waters)	SM 9221	MPN/100mL	10	400
E. coli (fresh waters)	SM 9221	MPN/100mL	10	235
Conventional Pollutants				
Oil and Grease	EPA 1664A	mg/L	5	5
Cyanide	SM 4500-CN E	mg/L	0.005	0.005
General				
Specific Conductance	EPA 120.1	µs/cm	1	1

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Total Hardness	SM 2340C	mg/L	2	2
Dissolved Organic Carbon	SM 5310B	mg/L	0.6	NA
Total Organic Carbon	SM 5310B	mg/L	1	1
Total Petroleum Hydrocarbon	EPA 1664	mg/L	5	5
Biochemical Oxygen Demand	SMOL-5210	mg/L	5	2
Chemical Oxygen Demand	SM 5220D	mg/L	20	20-900
MBAS	SM 5540C	mg/L	0.5	0.5
Chloride	EPA 300.0	mg/L	1	2
Fluoride	EPA 300.0	mg/L	0.1	0.1
Perchlorate	EPA 314.0	µg/L	4	4
Dissolved Phosphorus	SM 4500-P E	mg/L	0.05	0.05
Total Phosphorus	SM 4500-P E	mg/L	0.05	0.05
Orthophosphate-P	EPA 300.0	mg/L	0.2	NA
Ammonia (as N)	SM 4500-NH3 C	mg/L	0.1	0.1
Nitrate + Nitrite (as N)	EPA 300.0	mg/L	0.1	0.1
Nitrate (as N)	EPA 300.0	mg/L	0.1	0.1
Nitrite (as N)	EPA 300.0	mg/L	0.1	0.1
Total Kjehdahl Nitrogen (TKN)	SM 4500-NH3 C	mg/L	0.1	0.1
Total Alkalinity	SM 2320B	mg/L	2	2
Solids				
Suspended Sediment Concentration (SSC)	ASTMD 3977-97	mg/L	3	NA
Total Suspended Solids (TSS)	SM 2540D	mg/L	2	2

Parameter/Constituent	Method(1)	Units	Project	MRP Table E-2
			Reporting Limit	Minimum Level
Total Dissolved Solids (TDS)	SM 2540C	mg/L	10	2
Volatile Suspended Solids	EPA 1684	mg/L	1	2
Metals in Freshwater (dissolved and total)				
Aluminum	EPA 200.8	µg/L	100	100
Antimony	EPA 200.8	µg/L	0.5	0.5
Arsenic	EPA 200.8	µg/L	1	1
Beryllium	EPA 200.8	µg/L	0.5	0.5
Cadmium	EPA 200.8	µg/L	0.25	0.25
Chromium (total)	EPA 200.8	µg/L	0.5	0.5
Chromium (Hexavalent)	EPA 200.8	µg/L	5	5
Copper	EPA 200.8	µg/L	0.5	0.5
Iron	EPA 200.8	µg/L	100	100
Lead	EPA 200.8	µg/L	0.5	0.5
Mercury	EPA 1631	µg/L	0.5	0.5
Nickel	EPA 200.8	µg/L	1	1
Selenium	EPA 200.8	µg/L	1	1
Silver	EPA 200.8	µg/L	0.25	0.25
Thallium	EPA 200.8	µg/L	1	1
Zinc	EPA 200.8	µg/L	1	1
Metals in Seawater (dissolved and total)				
Copper	EPA 1640	µg/L	1	NA

Parameter/Constituent	Method(1)	Units	Project	MRP Table E-2
			Reporting Limit	Minimum Level
Lead	EPA 1640	µg/L	1	NA
Mercury	EPA 1631	µg/L	1	NA
Nickel	EPA 1640	µg/L	1	NA
Selenium	EPA 1640	µg/L	1	NA
Silver	EPA 1640	µg/L	1	NA
Zinc	EPA 1640	µg/L	1	NA
Organochlorine Pesticides				
Aldrin	EPA 608	ng/L	5	5
alpha-BHC	EPA 608	ng/L	10	10
beta-BHC	EPA 608	ng/L	5	5
delta-BHC	EPA 608	ng/L	5	5
gamma-BHC (Lindane)	EPA 608	ng/L	20	20
Chlordane-alpha	EPA 608	ng/L	100	100
Chlordane-gamma	EPA 608	ng/L	100	100
Oxychlordane	EPA 608	ng/L	200	NA
Cis-nonachlor	EPA 608	ng/L	200	NA
Trans-nonachlor	EPA 608	ng/L	200	NA
2,4'-DDD	EPA 608	ng/L	2	NA
2,4'-DDE	EPA 608	ng/L	2	NA
2,4'-DDT	EPA 608	ng/L	2	NA
4,4'-DDD	EPA 608	ng/L	50	50
4,4'-DDE	EPA 608	ng/L	50	50
4,4'-DDT	EPA 608	ng/L	10	10
Dieldrin	EPA 608	ng/L	10	10
Endosulfan I	EPA 608	ng/L	20	20
Endosulfan II	EPA 608	ng/L	10	10
Endosulfan Sulfate	EPA 608	ng/L	50	50

Parameter/Constituent	Method(1)	Units	Project	MRP Table E-2
			Reporting Limit	Minimum Level
Endrin	EPA 608	ng/L	10	10
Endrin Aldehyde	EPA 608	ng/L	10	10
Heptachlor	EPA 608	ng/L	10	10
Heptachlor Epoxide	EPA 608	ng/L	10	10
Toxaphene	EPA 608	ng/L	500	500
PCBs				
Aroclors (1016, 1221, 1232, 1242, 1248, 1254, 1260)	EPA 608	µg/L	0.5	0.5
Organophosphorus Pesticides				
Chlorpyrifos	EPA 614	ng/L	50	50
Diazinon	EPA 614	ng/L	10	10
Malathion	EPA 614	ng/L	1000	1000
Triazine				
Atrazine	EPA 530	µg/L	2	2
Cyanazine	EPA 530	µg/L	2	2
Prometryn	EPA 530	µg/L	2	2
Simazine	EPA 530	µg/L	2	2
Herbicides				
2,4-D	EPA 8151A	µg/L	10	10
Glyphosate	EPA 547	µg/L	5	5
2,4,5-TP-SILVEX	EPA 8151A	µg/L	0.5	0.5
Semivolatile Organic Compounds (SVOCs)				
1,2-Diphenylhydrazine	EPA 625	µg/L	1	1
2,4,6-Trichlorophenol	EPA 625	µg/L	10	10

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
2,4-Dichlorophenol	EPA 625	µg/L	1	1
2,4-Dimethylphenol	EPA 625	µg/L	2	2
2,4-Dinitrophenol	EPA 625	µg/L	5	5
2,4-Dinitrotoluene	EPA 625	µg/L	5	5
2,6-Dinitrotoluene	EPA 625	µg/L	5	5
2-Chloronaphthalene	EPA 625	µg/L	10	10
2-Chlorophenol	EPA 625	µg/L	2	2
2-Methyl-4,6-dinitrophenol	EPA 625	µg/L	5	5
2-Nitrophenol	EPA 625	µg/L	10	10
3,3'-Dichlorobenzidine	EPA 625	µg/L	5	5
4-Bromophenyl phenyl ether	EPA 625	µg/L	5	5
4-Chloro-3-methylphenol	EPA 625	µg/L	1	1
4-Chlorophenyl phenyl ether	EPA 625	µg/L	5	5
4-Nitrophenol	EPA 625	µg/L	5	5
Acenaphthene	EPA 625	µg/L	1	1
Acenaphthylene	EPA 625	µg/L	2	2
Anthracene	EPA 625	µg/L	2	2
Benzidine	EPA 625	µg/L	5	5
Benzo(a)anthracene	EPA 625	µg/L	5	5
Benzo(a)pyrene	EPA 625	µg/L	2	2
Benzo(b)fluoranthene	EPA 625	µg/L	10	10
Benzo(g,h,i)perylene	EPA 625	µg/L	5	5
Benzo(k)fluoranthene	EPA 625	µg/L	2	2
Benzyl butyl phthalate	EPA 625	µg/L	10	10
bis(2-Chloroethoxy) methane	EPA 625	µg/L	5	5
bis(2-Chloroisopropyl) ether	EPA 625	µg/L	2	2
bis(2-Chloroethyl) ether	EPA 625	µg/L	1	1

Parameter/Constituent	Method[(1)]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
bis(2-Ethylhexyl) phthalate	EPA 625	µg/L	5	5
Chrysene	EPA 625	µg/L	5	5
Dibenzo(a,h)anthracene	EPA 625	µg/L	0.1	0.1
Diethyl phthalate	EPA 625	µg/L	2	2
Dimethyl phthalate	EPA 625	µg/L	2	2
Di-n-butylphthalate	EPA 625	µg/L	10	10
Di-n-octylphthalate	EPA 625	µg/L	10	10
Fluoranthene	EPA 625	µg/L	0.05	0.05
Fluorene	EPA 625	µg/L	0.1	0.1
Hexachlorobenzene	EPA 625	µg/L	1	1
Hexachlorobutadiene	EPA 625	µg/L	1	1
Hexachloro-cyclo pentadiene	EPA 625	µg/L	5	5
Hexachloroethane	EPA 625	µg/L	1	1
Indeno(1,2,3-cd)pyrene	EPA 625	µg/L	0.05	0.05
Isophorone	EPA 625	µg/L	1	1
Naphthalene	EPA 625	µg/L	0.2	0.2
Nitrobenzene	EPA 625	µg/L	1	1
N-Nitroso-dimethyl amine	EPA 625	µg/L	5	5
N-Nitrosodiphenylamine	EPA 625	µg/L	1	1
N-Nitroso-di-n-propyl amine	EPA 625	µg/L	5	5
Pentachlorophenol	EPA 625	µg/L	2	2
Phenanthrene	EPA 625	µg/L	0.05	0.05
Total Phenols	EPA 625	mg/L	0.2	0.1
Phenol	EPA 625	µg/L	1	1
Pyrene	EPA 625	µg/L	0.05	0.05
Volatile Organic Compounds				
1,2,4-Trichlorobenzene	EPA 625	µg/L	1	1

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
1,2-Dichlorobenzene	EPA 625	µg/L	1	1
1,3-Dichlorobenzene	EPA 625	µg/L	1	1
1,4-Dichlorobenzene	EPA 625	µg/L	1	1
2-Chloroethyl vinyl ether	EPA 625	µg/L	1	1
Methyl tert-butyl ether (MTBE)	EPA 625	µg/L	1	1

RL – Reporting Limit NA – Not applicable

1. RLs are equal to those specified in the MRP of the Permit. Methods may be substituted by an equivalent method that is lower than or meets the project RL.

Table B-3
Data Quality Objectives

Parameter	Accuracy	Precision	Recovery	Completeness
Field Measurements				
Water Velocity (for Flow calc.)	2%	NA	NA	90%
pH	+ 0.2 pH units	+ 0.5 pH units	NA	90%
Temperature	+ 0.5 oC	+ 5%	NA	90%
Dissolved Oxygen	+ 0.5 mg/L	+ 10%	NA	90%
Conductivity	5%	5%	NA	90%
Laboratory Analyses – Water				
Conventionals and Solids	80 – 120%	0 – 25%	80 – 120%	90%
Aquatic Toxicity	(1)	(2)	NA	90%
Nutrients(3)	80 – 120%	0 – 25%	90 – 110%	90%
Metals(3)	75 – 125%	0 – 25%	75 – 125%	90%
Semi-Volatile Organics(3)	50 – 150%	0 – 25%	50 – 150%	90%
Volatile Organics(3)	50 – 150%	0 – 25%	50 – 150%	90%
Triazines(3)	50 – 150%	0 – 25%	50 – 150%	90%
Herbicides(3)	50 – 150%	0 – 25%	50 – 150%	90%
OC Pesticides(3)	50 – 150%	0 – 25%	50 – 150%	90%
PCB Congeners(3)	50 – 150%	0 – 25%	50 – 150%	90%
PCB Aroclors(3)	50 – 150%	0 – 25%	50 – 150%	90%
OP Pesticides(3)	50 – 150%	0 – 25%	50 – 150%	90%

1. Must meet all method Test Acceptibility Critera (TAC) relative to the reference toxicant test.
2. Must meet all method Test Acceptibility Critera (TAC) relative to sample replicates.
3. See **Error! Not a valid result for table.**,for a list of individual constituents in each suite for water.

1.2.1 Method Detection Limit Studies

Any laboratory performing analyses under this program must routinely conduct MDL studies to document that the MDLs are less than or equal to the project-specified RLs. If any analytes have MDLs that do not meet the project RLs, the following steps must be taken:

- Perform a new MDL study using concentrations sufficient to prove analyte quantitation at concentrations less than or equal to the project-specified RLs per the procedure for the Determination of the Method Detection Limit presented in Revision 1.1, 40 Code of Federal Regulations (CFR) 136, 1984.
- No samples may be analyzed until the issue has been resolved. MDL study results must be available for review during audits, data review, or as requested. Current MDL study results must be reported for review and inclusion in project files.

An MDL is developed from seven aliquots of a standard containing all analytes of interest spiked at five times the expected MDL. These aliquots are processed and analyzed in the same manner as environmental samples. The results are then used to calculate the MDL. If the calculated MDL is less than 0.33 times the spiked concentration, another MDL study should be performed using lower spiked concentrations.

1.2.2 Project Reporting Limits

Laboratories generally establish RLs that are reported with the analytical results—these may be called reporting limits, detection limits, reporting detection limits, or several other terms by the reporting laboratory. These laboratory limits must be less than or equal to the project RLs listed in **Table B-2.** Wherever possible, project RLs are lower than the relevant numeric criteria or toxicity thresholds. Laboratories performing analyses for this project must have documentation to support quantitation at the required levels.

1.2.3 Laboratory Standards and Reagents

All stock standards and reagents used for standard solutions and extractions must be tracked through the laboratory. The preparation and use of all working standards must be documented according to procedures outlined in each laboratory's Quality Assurance (QA) Manual; standards must be traceable according to USEPA, A2LA or National Institute for Standards and Technology (NIST) criteria. Records must have sufficient detail to allow determination of the identity, concentration, and viability of the standards, including any mixings performed to obtain the working standard. Date of preparation, analyte or mixture, concentration, name of preparer, lot or cylinder number, and expiration date, if applicable, must be recorded on each working standard.

1.2.4 Sample Containers, Storage, Preservation, and Holding Times

Sample containers must be pre-cleaned and certified free of contamination according to the USEPA specification for the appropriate methods. Sample container, storage and preservation, and holding time requirements are provided in **Table B-4**.These values may vary based on the selected laboratory. The analytical laboratories will supply sample containers that already contain preservative (**Table B-4**), including ultra-pure hydrochloric and nitric acid, where applicable. After collection, samples will be stored at 4°C until arrival at the contract laboratory.

Table B-4
Sample Container, Sample Volume, Initial Preservation, and Holding Time Requirements for Parameters Analyzed at a Laboratory

Parameter	Sample Container	Sample Volume[1]	Immediate Processing and Storage	Holding Time
Water				
Toxicity				
Initial Screening	Glass or FLPE-lined jerrican	40 L[6]	Store at 4°C	36 hours[2]
Follow-Up Testing				
Phase I TIE				
Total coliform, fecal coliform, and Enterococcus (marine waters)	PE	120 mL	Na2S2O3 and Store at 8ºC	6 hours
Fecal coliform, *E. coli* (fresh waters)	PE	120 mL		

Parameter	Sample Container	Sample Volume(1)	Immediate Processing and Storage	Holding Time
Oil and Grease	PE	250 mL	HCl and Store at 4°C	28 days
Cyanide	PE	1 L	NaOH and Store at 4°C	14 days
Dissolved Organic Carbon (DOC)	PE	250 mL	Store at 4°C	Filter/28 days
Total Organic Carbon (TOC)	PE	250 mL	H2SO4 and Store at 4°C	28 days
Total Petroleum Hydrocarbon	Glass	1 L	HCl or H2SO4 and Store at 4°C	7/40 days(3)
Biochemical Oxygen Demand	PE	1L	Store at 4°C	48 hours
Chemical Oxygen Demand	PE	500 mL	H2SO4 and Store at 4°C	28 days
MBAS	PE	1 L	Store at 4°C	48 hours
Fluoride	PE	500 mL	None required	28 days
Chloride	PE	250 mL	Store at 4°C	28 days
Perchlorate	PE	500 mL	Store at 4°C	28 days
Nitrate Nitrogen	PE	250 mL	Store at 4°C	48 hours
Nitrite Nitrogen				
Orthophosphate-P				
Ammonia Nitrogen	Glass	250-mL	H2SO4 and Store at 4°C	28 days
Total and Dissolved Phosphorus				
Organic Nitrogen				
Nitrate + Nitrite (as N)				
Total Kjehdahl Nitrogen (TKN)	PE	250 mL	H2SO4 and Store at 4°C	28 days
Total Alkalinity	PE	500 mL	Store at 4°C	14 days
Suspended Sediment Concentration (SSC)	PE	250 mL	Store at 4°C	120 days
Total Suspended Solids (TSS)	PE	250 mL	Store at 4°C	7 days
Total Dissolved Solids (TDS)	PE	250 mL	Store at 4°C	7 days
Volatile Suspended Solids	PE	250 mL	Store at 4°C	7 days
Hardness	PE	500 mL	Store at 4°C	180 days
Metals				6 months(4)
Mercury	Glass	500 mL	Store at 4°C	48 Hours
PCBs, OC Pesticides, OP Pesticides, Triazine Pesticides	Amber glass	4 x 1 L	Store at 4°C	7/40 days(3)
Suspended Solids Analysis for Organics and Metals	Amber glass	20 x 1 L	Store at 4°C	1 year(5)
Herbicides	Glass	2 x 40 mL	Thiosulfate and	14 days

Parameter	Sample Container	Sample Volume(1)	Immediate Processing and Storage	Holding Time
			Store at 4°C	
Semivolatile Organic Compounds	Glass	2 x 1 L	Store at 4°C	7 days
Volatile Organic Compounds	VOA	3 x 40 mL	HCl and Store at 4°C	14 days

PE – Polyethylene

1. Additional volume may be required for QC analyses.
2. Tests should be initiated within 36 hours of collection. The 36-hour hold time does not apply to subsequent analyses for TIEs. For interpretation of toxicity results, samples may be split from toxicity samples in the laboratory and analyzed for specific chemical parameters. All other sampling requirements for these samples are as specified in this document for the specific analytical method. Results of these analyses are not for any other use (e.g., characterization of ambient conditions) because of potential holding time exceedances and variance from sampling requirements.
3. 7/40 = 7 days to extract and 40 days from extraction to analysis.
4. 6 months after preservation.
5. One year if frozen, otherwise 14 days to extract and 40 days from extraction to analysis.
6. Sample volumes for follow-up testing and Phase I TIEs for sediments may change based on percent solids in previous samples. In addition, collection of sediment for follow-up testing and Phase I TIEs may change based on observations of toxicity in previous sampling events.

1.3 Aquatic Toxicity Testing and Toxicity Identification Evaluations

The aquatic toxicity testing requirements outlines in the MS4 Permit, are intended to identify whether the water column toxicity is observed in targeted receiving waters and then assess which pollutant categories may potentially be causing the adverse aquatic effects. The results of aquatic toxicity testing are intended to guide future receiving and outfall water quality monitoring and contribute to the identification and control of toxicity causing pollutants in urban runoff through watershed control measures that may include: pollutant source controls, modified minimum control measures (MCMs) and BMPs. The following outlines the approach for conducting SMB J7 aquatic toxicity monitoring and evaluating results. Control measures and management actions to address confirmed toxicity caused by urban runoff are addressed by the WMP, either via currently identified management actions or those that are identified via adaptive management of the WMP.

The approach to conducting aquatic toxicity monitoring is presented in **Figure B-1**, which describes a general evaluation process for each sample collected as part of routine sampling conducted twice per year in wet weather and once per year in dry weather. Monitoring begins in the receiving water and the information gained is used to identify constituents for monitoring at outfalls to support the identification of pollutants that need to be addressed in the WMP. The sub-sections below describe the detailed process and its technical and logistical rationale.

Although not specified for testing at this time, the freshwater toxicity testing approach is also provided if such testing is initiated.

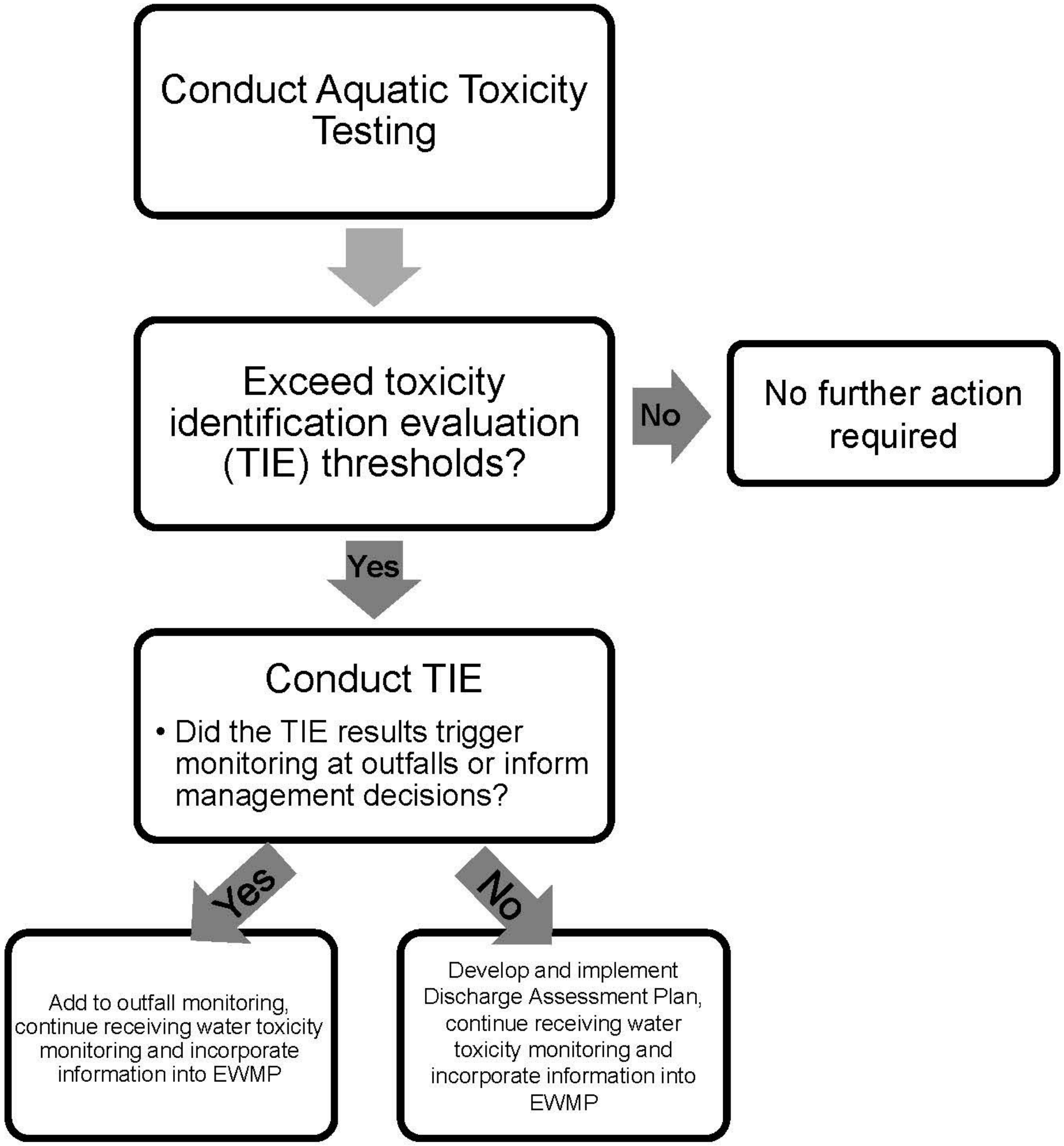


Figure B-1. Generalized Aquatic Toxicity Assessment Process

1.3.1 Sensitive Species Selection

The MRP (page E-32) states that a sensitivity screening to select the most sensitive test species should be conducted unless "a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring shall be conducted using only that test species." Previous relevant studies conducted in the watershed should be considered. Such studies may have been completed via previous MS4 sampling, wastewater NPDES sampling, or special studies conducted within the watershed. The following sub-sections discuss the species selection process for assessing aquatic toxicity in receiving waters.

1.3.1.1 *Freshwater Sensitive Species Selection*

As described in the MRP (page E-31), if samples are collected in receiving waters with salinity less than 1 part per thousand (ppt), or from outfalls discharging to receiving waters with salinity less than 1 ppt, toxicity tests should be conducted on the most sensitive test species in accordance with species and short-term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). Static renewal freshwater toxicity test species identified in the MRP are:

- Fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method).
- Daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method).
- Non-static renewal Green alga, *Selenastrum capricornutum* (Growth Inhibition Test Method).

Prior fresh receiving water toxicity testing studies within the EWMP area were not identified during CIMP preparation. Available toxicity data for the similar and adjacent Los Angeles River, Ballona Creek, and Dominguez Channel watersheds, suggest that organophosphate pesticides, pyrethroids, and metals are occasionally observed aquatic toxicants in regional urban runoff receiving waters. Based on the occasional presence of these toxicants in the WMP area, the relative sensitivity of the three species to these pollutants was considered in evaluating which species would most likely be affected by local water samples.

Ceriodaphnia dubia (*C. dubia*) is often used locally and reported upon nationally, as a broad spectrum test species that is sensitive for historical and current use pesticides and metals, and studies indicate that it is more sensitive to the toxicants of concern than *Pimephales promelas* (*P. promelas*) or *Selenastrum capricornutum* (*S. capricornutum*). In *Aquatic Life Ambient Freshwater Quality Criteria - Copper*, the USEPA reports greater sensitivity of *C. dubia* to copper (species mean acute value of 5.93 µg/l) than for *P. promelas* (species mean acute value of 69.93 µg/l; EPA, 2007). *C. dubia*'s relative sensitivity to copper, extends to multiple metals. In developing pesticide criteria for the Central Valley Regional Water Quality Control Board researchers at University of California at Davis, reported higher sensitivity of *C. dubia* to diazinon and bifenthrin (species mean acute value of 0.34 µg/l and 0.105 µg/l) compared to *P. promelas* (species mean acute value of 7804 µg/l and 0.405 µg/l; Palumbo et al., 2010a,b). Additionally, in a stormwater study for the City of Stockton, urban stormwater runoff found acute and chronic toxicity to *C. dubia*, with no toxicity to *S. capricornutum* or *P. promelas* (Lee and Lee, 2001). The toxicity was attributed to organophosphate pesticides, indicating a higher sensitivity of *C. dubia* compared to *S. capricornutum* or *P. promelas*. While *P. promelas* is generally less sensitive to metals and pesticides, this species can be more sensitive to ammonia than *C. dubia*. However, as ammonia is not typically a constituent of concern for urban runoff and ammonia is not consistently observed above the toxic thresholds in the SMB watershed, *P. promelas* is not considered a particularly sensitive species for evaluating the impacts of urban runoff in freshwater receiving waters in the SMB watershed.

S. capricornutum is a species sensitive to herbicides. However, while sometimes present in urban runoff, herbicides are not identified as a potential toxicant in the watershed. Additionally, *S. capricornutum* is not considered the most sensitive species as it is not sensitive to pyrethroids or organophosphate pesticides and is not as sensitive to metals as *C. dubia*. Additionally, the *S. capricornutum* growth test can be affected by high concentrations of suspended and dissolved solids, color, and pH extremes, which can interfere with the determination of sample toxicity. As a result, it is common to manipulate the sample by centrifugation and filtration to remove solids in order to conduct the toxicity test; however, this process may affect the toxicity of the sample. In a study of urban highway stormwater runoff (Kayhanian et. al, 2008), *S. capricornutum* response to the stormwater samples was more variable than the *C. dubia* and *P. promelas* and in some cases the algal growth was possibly enhanced due to the presence of stimulatory nutrients. Also, in a study on the City of Stockton urban stormwater runoff (Lee and Lee, 2001) the *S. capricornutum* tests rarely detected toxicity where the *C. dubia* and the *P. promelas* regularly detected toxicity.

Based on best professional judgment and local experience with the Permit-identified fresh water species, *C. dubia* is most sensitive to the broadest range of potential toxicant(s) typically found in local fresh receiving waters impacted by urban runoff and will be selected for fresh water toxicity testing by the SMB JG7 WMP Group. The species can be maintained laboratory cultures making them generally available year round. The ease of sample collection and higher sensitivity will support assessing the presence of ambient receiving water toxicity or long term effects of toxic stormwater over time. As such, toxicity testing in the freshwater portions of the watershed will be conducted using *C. dubia*. However, *C. dubia* test organisms are typically cultured in moderately hard waters (80-100 mg/L CaCO3) and can have increased sensitivity to elevated water hardness greater than 400 mg/L CaCO3), which is beyond their typical habitat range. Because of this, in instances where hardness in site waters exceeds 400 mg/L (CaCO3), an alternative test species may be used. Daphnia magna is more tolerant to high hardness levels and is a suitable substitution for *C. dubia* in these instances (Cowgill and Milazzo, 1990).

1.3.1.2 *Saltwater Sensitive Species Selection*

Samples collected in receiving waters with salinity equal to or greater than 1 ppt or from outfalls discharging to receiving waters with salinity that is equal to or greater than 1 ppt, should be tested using the most sensitive test species in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA/600/R-95/136, 1995)*. The marine and estuarine test species identified in the MRP are:

- A static renewal toxicity test with the topsmelt, *Atherinops affinis* (Larval Survival and Growth Test Method).
- A static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Fertilization Test Method).
- A static non-renewal toxicity test with the giant kelp, *Macrocystis pyrifera* (Germination and Growth Test Method).

In addition to the three species identified in the MRP, the red abalone, *Haliotis rufescens (H. rufescens*), larval development test was also considered given the extensive use in region.

Although all the species mentioned have been demonstrated as sensitive to a wide variety of toxicants and have been subject to numerous inter- and intra-laboratory testing using standardized toxicants, two species: *Macrocystis pyrifera* (*M. pyrifera*) and *Atherinops affinis* (*A. affinis*); have limitations when used to assess the toxicity of stormwater compared to the sea urchin fertilization test and the red abalone larval development test.

The method for *M. pyrifera* is a 48-hour chronic toxicity test that measures the percent zoospore germination and the length of the gametophyte germ tube. Although the test may be sensitive to herbicides, fungicides, and treatment plant effluent, the use of *M. pyrifera* as a test species for stormwater monitoring may not be ideal. Obtaining sporophylls for stormwater testing could also be a limiting factor for selecting this test. Collection of *M. pyrifera* sporophylls from the field is necessary prior to initiating the test and the target holding time for any receiving water or stormwater sample is 36 hours; however, 72 hours is the maximum time a sample may be held prior to test initiation. During the dry season, meeting the 36-72 hour holding time will be achievable; however, field collection during wet weather may be delayed beyond the maximum holding time due to heavy seas and inaccessible collection sites. In addition, collection of *M. pyrifera* sporophylls during the storm season may include increased safety risks that can be avoided by selection of a different species.

The *A. affinis* test measures the survival and growth test of a larval fish over seven days. At the end of seven days of exposure to a suspected toxicant, the number of surviving fish are recorded, along with their weights, and compared to those exposed to non-contaminated seawater. Positive characteristics of the *A. affinis*s chronic test include the ability to purchase test organisms from commercial suppliers as well as being one of the few indigenous test species that may be used to test undiluted stormwater by the addition of artificial sea salts to within the range of marine receiving waters. Unfortunately, the tolerance of *A. affinis* to chemicals in artificial sea salts may also explain their lack of sensitivity to changes in water quality compared to other test organisms such as the sea urchin or red abalone. Further, there are concerns with the comparability of conducting a seven-day exposure test when most rain events do not occur over a seven-day period.

The *S. purpuratus* fertilization test measures the ability of *S. purpuratus* sperm to fertilize an egg when exposed to a suspected toxicant. The *S. purpuratus* fertilization has been selected as a chronic toxicity test organism in previous MS4 permits and has been used to assess ambient receiving water toxicity, sediment pore water toxicity, as well as stormwater toxicity. The *S. purpuratus* fertilization test is also among the most sensitive test species to metals. The adult test organisms may be purchased and held in the lab prior to fertilization, and the sample volume necessary to conduct the test is small with respect to the other suggested tests. The minimal exposure period (20 min) allows for a large number of tests to be conducted over a short period of time and permits the testing of toxicants that may lose their potency over long periods of time.

The *H. rufescens* larval development test measures the percent of abnormal shell development in larvae exposed to toxic samples for 48 hours. The *H. rufescens* is commonly used to test treatment plant effluent, but has had limited use in stormwater compared to the *S. purpuratus* fertilization test. The advantages of the red abalone test include a sensitive endpoint, the ability to purchase abalone from commercial suppliers and hold test organisms prior to spawning, and low variability in results compared to other species (e.g., *S. purpuratus* fertilization test). Thus, though not listed as a potential test species for use in stormwater monitoring in the MS4 permit, it was considered as a potentially sensitive species for the purposes of selecting the most sensitive species.

Due to the limitations of *the giant kelp germination and growth test and the topsmelt survival and growth test*, in addition to not being particularly sensitive to the constituents identified as problematic in stormwater water runoff from this watershed, these tests are not considered particularly helpful in supporting the identification of pollutants of concern. Based on the sensitivity, smaller test volume requirements, their ability to be housed in the lab prior to testing, and shorter exposure times, the *S. purpuratus* fertilization test and the red abalone development test will be considered during sensitive species selection to measure toxicity in marine and estuarine environments. Based on historical data of the sensitivity of the *S. purpuratus* and *H. rufescens* tests, and the limiting factors associated with the *A. affinis* and *M. pyrifera tests*, the sensitive species test for marine and estuarine species will be conducted with the sea urchin and red abalone tests. Species screening was determined to be appropriate for these two species (as opposed to selecting just one) as testing conducted within the region with both species have shown varying sensitivity. Thus, it is appropriate to test both to determine sensitivity at a given site. After the screening testing is completed, monitoring will be conducted with the most-sensitive species.

1.3.2 Testing Period

The following subsections characterize the toxicity testing periods for samples collected during dry and wet weather conditions for the duration of the permit (4 years).

1.3.2.1 *Freshwater Testing Periods*

As wet weather conditions in the region generally persist for less than the acute and chronic testing periods (typically 48 hours and 7 days, respectively), the shorter of the two testing methods, in the case of *C. dubia* acute testing measuring survival, will be used for wet weather toxicity testing. Utilization of chronic tests to assess wet weather samples generates results that are not representative of receiving water conditions. Acute toxicity tests will be utilized to be consistent with the relatively shorter exposure periods of watershed species to potential urban stormwater toxicants. Acute testing to assess survival endpoints will be conducted in accordance with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (EPA, 2002b).

Chronic toxicity tests will be used to assess survival for *C. dubia* in dry weather samples. Chronic testing will be conducted on undiluted grab samples in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (USEPA, 2002a).

1.3.2.2 *Saltwater Testing Period*

Two marine and estuarine toxicity species tests utilize methods that have short durations (20 minutes for the *S. purpuratus* fertilization test and 48 hours for the *H. rufescens* development test), the end points are sub-lethal and can be considered representative of acute or chronic effects. Both test species and test methods are suitable for wet weather and dry weather monitoring.

1.3.3 Toxicity Endpoint Assessment and Toxicity Identification Evaluation Triggers

As directed by the Permit MRP, acute and chronic toxicity test endpoints will be analyzed using the Test of Significant Toxicity (TST) t-test approach specified by the USEPA (USEPA, 2010). The Permit specifies that the chronic in-stream waste concentration (IWC) be set at 100% receiving water for receiving water samples and 100% discharge for outfall samples. Follow-up triggers are generally based on the Permit specified statistical assessment as described below.

For acute *C. dubia* toxicity testing, follow up toxicity identification evaluation (TIE) testing is warranted if a statistically significant 50% difference in mortality is observed between the sample and laboratory control, a toxicity identification evaluation (TIE) will be performed. TIE procedures are further discussed in detail in the following subsection. Experience conducting TIEs in regional receiving waters supports using a 50% mortality trigger to provide a reasonable opportunity for a successful TIE. During 2003 and 2004 TMDL monitoring in the Calleguas Creek Watershed (CCW), TIEs were initiated for samples exceeding the 50% threshold, the majority of which displayed 100% mortality. In that study, toxicity had degraded in approximately 40% of the samples on which the procedures were initiated making the effort unsuccessful in pinpointing specific toxicants. The Regional Board approved monitoring program for the CCW Toxicity, Chlorpyrifos and Diazinon TMDL utilizes a 50% threshold for TIE initiation. Additionally, a 50% mortality threshold is utilized in the Ventura County MS4 Permit.

For chronic *C. dubia* toxicity testing, if a statistically significant 50% difference in mortality is observed between the sample and laboratory control, a TIE will be performed. If a statistically significant 50% difference in a sub-lethal endpoint is observed between the sample and laboratory control, a confirmatory sample will be collected from the receiving water within two weeks of obtaining the results of the initial sample. If a statistically significant 50% difference in mortality or sub-lethal endpoint is observed between the sample and laboratory control on the confirmatory sample, a TIE will be performed.

For the chronic marine and estuarine tests, the percent effect will be calculated. The percent effect is defined as the difference between the mean control response and the mean IWC response divided by the control response, multiplied by 100. A TIE will be performed if the percent effect value is equal to or greater than 50 percent. The TIE procedures will be initiated as soon as possible after the toxicity trigger threshold is observed to reduce the potential for loss of toxicity during sample storage. If the cause of toxicity is readily apparent or is caused by pathogen related mortality (PRM) or epibiont interference, the result will be rejected. In cases where significant endpoint toxicity effects greater than 50% are observed in the original sample, but the follow-up TIE positive control "signal" is not statistically significant, the cause of toxicity will be considered non-persistent and no sample follow-up testing is required. Future test results should be evaluated to determine if parallel TIE treatments are necessary to provide an opportunity to identify the cause of toxicity.

1.3.4 Toxicity Identification Evaluation Approach

The results of toxicity testing will be used to trigger further investigations to determine the cause of observed laboratory toxicity. The primary purpose of conducting TIEs is to support the identification of management actions that will remove toxicants from the receiving waters. Successful TIEs will guide adaptive outfall monitoring strategies to identify and analyze for suspect pollutant(s) and guide source control efforts

The TIE approach is divided into three phases as described in USEPA's 1991 Methods for Aquatic Toxicity Identification Evaluations – Phase I Toxicity Characterization Procedures – Second Edition (EPA/600/6-9/003) and briefly summarized as follows:

- Phase I utilizes methods to characterize the physical/chemical nature of the constituents which cause toxicity. Such characteristics as solubility, volatility and filterability are determined without specifically identifying the toxicants. Phase I results are intended as a first step in specifically identifying the toxicants but the data generated can also be used to develop treatment methods that remove the toxicity without specifically identifying the toxicants.
- Phase II utilizes methods to specifically identify toxicants, or toxicant pollutant class.
- Phase III utilizes methods to confirm the identity of suspected toxicant(s).

TIE methods will generally adhere to USEPA procedures documented in conducting TIEs (USEPA, 1991, 1992, 1993a-b). A Phase I TIE will be conducted on samples that exceed the TIE. Water quality data will be reviewed to support future evaluation of potential toxicants. TIEs will perform the manipulations described in **Table B-5.**

Table B-5
Aquatic Toxicity Identification Evaluation Sample Manipulations

TIE Sample Manipulation	Expected Response
Adjust to between pH 7 and 8.5	Alters toxicity in pH sensitive compounds (i.e., ammonia and some trace metals)
Filtration or centrifugation	Removes particulates and associated toxicants
Ethylene Diamine Tetra Acetic Acid (EDTA)	Chelates trace metals, particularly divalent cationic metals
Sodium thiosulfate (STS) addition	Reduces toxicants attributable to oxidants (i.e., chlorine) and some trace metals
Piperonyl Butoxide (PBO)	Reduces toxicity from organophosphate pesticides such as diazinon, chlorpyrifos and malathion, and enhances pyrethroid toxicity
Carboxylesterase addition(1)	Hydrolyzes pyrethroids
Solid Phase Extraction (SPE) with C18 column	Removes non-polar organics (including pesticides) and some relatively non-polar metal chelates
Sequential Solvent Extraction of C18 column	Further resolution of SPE-extracted compounds for chemical analyses
No Manipulation	Baseline test for comparing the relative effectiveness of other manipulations

Carboxylesterase addition has been used in recent studies to help identify pyrethroid-associated toxicity (Wheelock et al., 2004; Weston and Amweg, 2007). However, this treatment is experimental in nature and should be used along with other pyrethroid-targeted TIE treatments (e.g., PBO addition).

Toxicity causation will be tentatively identified based on the treatments in **Table B-5** and, when possible, the results verified based on water column chemistry analyses. After an initial determination of the cause of toxicity, the information may be used during future TIEs to target the expected toxicant (s) or provide new treatments to narrowly identify the toxicant cause(s). Moreover, if the toxicant or toxicant class is not initially identified, toxicity monitoring during subsequent events will confirm if the toxicant is persistent or a short-term episodic occurrence.

As the primary goals of conducting TIEs is to identify pollutants for incorporation into outfall monitoring, narrowing the list of toxicants following Phase I TIEs via Phase II or III TIEs is not necessary if the toxicant class determined during the Phase I TIE is sufficient for: (1) identifying additional pollutants for outfall monitoring; and/or (2) identifying control measures. Thus, if the specific pollutant(s) or the analytical class of pollutant (e.g., metals that are analyzed via USEPA Method 200.8) are identified then sufficient information is available to inform the addition of pollutants to outfall monitoring.

Phase II TIEs may be utilized to identify specific toxicants in a sample if information beyond that gained via the Phase I TIE and review of chemistry data is needed to identify monitoring or management actions. Phase III TIEs will be conducted following any Phase II TIEs.

TIEs will be considered inconclusive if:

- The toxicity is persistent (i.e., observed in the positive control), and
- The cause of toxicity cannot be attributed to a class of constituents (e.g., insecticides, metals, etc.) that can be targeted for monitoring or additional source controls.

If (1) a combination of causes act in a synergistic or additive manner are identified; (2) the toxicity can be removed with a treatment or combination of the TIE treatments; or (3) the analysis of water quality data collected during the same event identifies the pollutant or analytical class of pollutants, the result of a TIE is considered conclusive.

Note that the MRP (page E-33) allows a TIE Prioritization Metric to be used in ranking sites for TIEs, As the extent to which TIEs will be conducted is unknown, prioritization cannot be assessed at this time, but may be utilized in the future based on the results of toxicity monitoring and the CIMP adaptive management.

1.3.5 Discharge Assessment

The SMB JG7 WMP Group will prepare a Discharge Assessment Plan (DAP) if TIEs conducted on consecutive sampling events are inconclusive. The Discharge Assessment will only be initiated after consecutive inconclusive TIEs, because of the inherit variability associated with the toxicity and TIE testing methods.

The DAP will consider the observed potential receiving and outfall toxicants, above known species effect levels and the relevant exposure periods compared to the duration of the observed toxicity. The DAP will identify:

1. Additional potential receiving water toxicity monitoring to further evaluate the spatial extent of toxicity.
2. The toxicity test species to be utilized. If a different species is proposed, justification for the substitution will be provided.
3. The number and location of monitoring sites and their spatial relation to the observed receiving water toxicity.
4. The number of monitoring events that will be conducted, a schedule for conducting the monitoring, and a process for evaluating the completion of the assessment monitoring.

The DAP will be submitted to Regional Board staff for comment within 60 days of receipt of notification of the second consecutive inconclusive result. If no comments are received within 30 days, it will be assumed that the approach is appropriate for the given situation and the DAP will be implemented within 90-days of submittal. If comments are received within 30 days, the Plan will be resubmitted to Regional Board staff and the DAP will be implemented within 90-days of submittal of a version of the Plan that does not receive comments from Regional Board staff.

1.3.6 Follow Up on Toxicity Testing Results

The MRP (page E-33) indicates the following actions should be taken when a toxicant or class of toxicants is identified through a TIE:

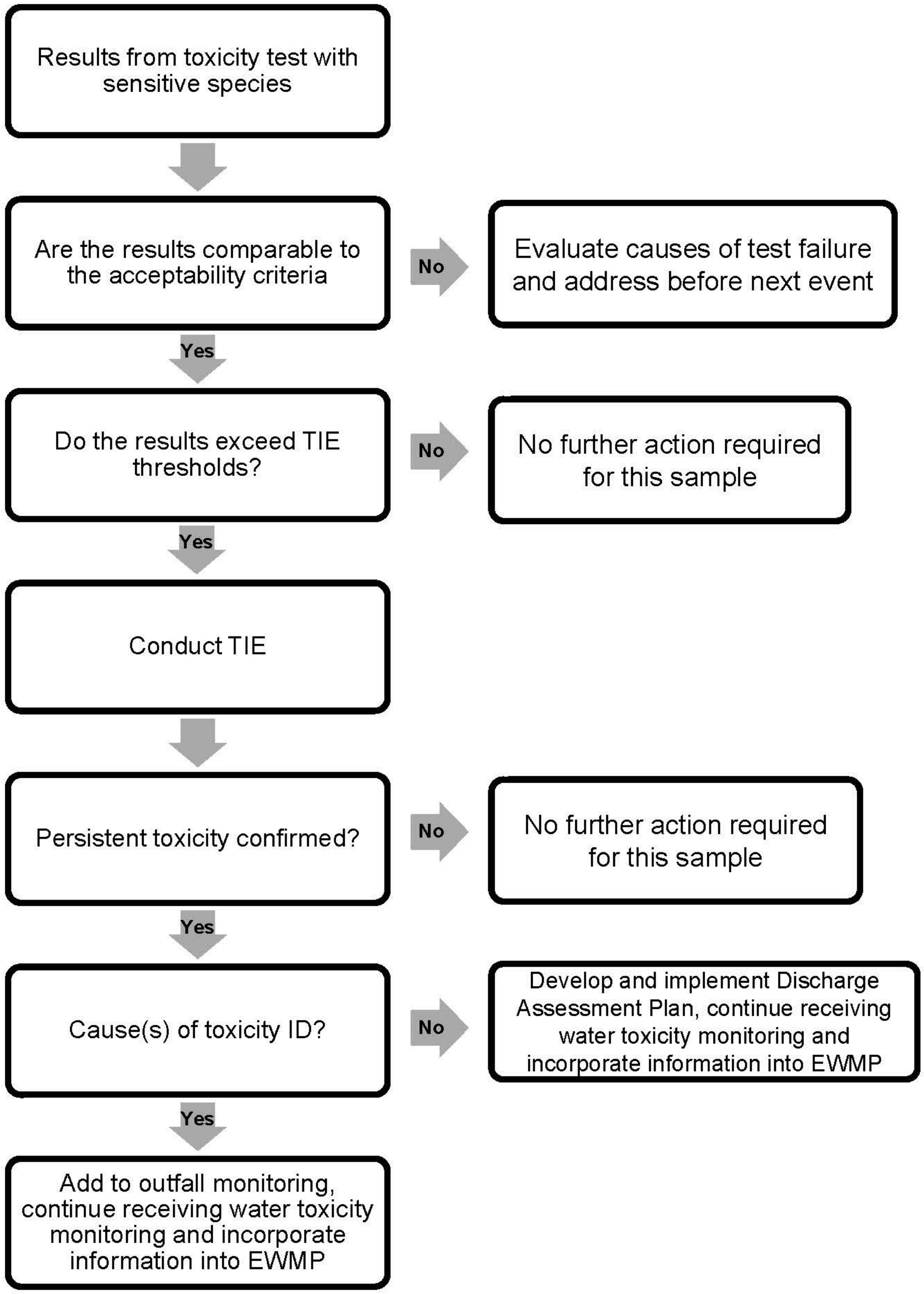
- SMB JG7 WMP Group Members shall analyze for the toxicant(s) during the next scheduled sampling event in the discharge from the outfall(s) upstream of the receiving water location.
- If the toxicant is present in the discharge from the outfall at levels above the applicable receiving water limitation, a toxicity reduction evaluation (TRE) will be performed for that toxicant.
- The list of constituents monitored at outfalls identified in the CIMP will be modified based on the results of the TIEs.

Monitoring for constituents identified based on the results of a TIE will occur as soon as feasible following the completion of a successful TIE (i.e., the next monitoring event that is at least 45 days following the toxicity laboratory's report transmitting the results of a successful TIE).

The identification and implementation of control measures to address the causes of toxicity are tied to management of the stormwater program, not the CIMP. It is expected that the requirements of TREs will only be conducted for toxicants that are not already addressed by an existing Permit requirement (i.e., TMDLs) or existing or planned management actions.

1.3.7 Summary of Aquatic Toxicity Monitoring

The approach to conducting aquatic toxicity monitoring as described in the previous sections is summarized in detail in **Figure B-2**. The intent of the approach is to identify the cause of toxicity observed in receiving water to the extent possible with the toxicity testing tools available, thereby directing outfall monitoring for the pollutants causing toxicity with the ultimate goal of supporting the development and implementation of management actions.



Test failure includes pathogen or epibont interference, which should be addressed prior to the next toxicity sampling event.

For freshwater, the TIE threshold is equal to or greater than 50% (≥50%) mortality in an acute (wet weather) or chronic (dry weather) test. If a ≥50% effect in a sub-lethal endpoint for chronic test is observed during dry weather, a follow up sample will be collected within two weeks of the completion of the initial sample collection. If the follow up sample exhibits a ≥50% effect, a TIE will be initiated.

For marine waters and estuarine waters, the TIE threshold is the percent effect value ≥50%. If a ≥50% or greater effect is observed during dry weather a follow up sample will be collected within two weeks of the initial sample collection and if the follow up sample exhibits a ≥50% effect, a TIE will be initiated.

The goal of conducting Phase I TIEs is to identify the cause of toxicity so that outfall monitoring can incorporate the toxicant(s) into the list of constituents monitored during outfall monitoring. Thus, if specific toxicant(s) or the analytical class of toxicants (i.e., metals that are analyzed via EPA Method 200.8) are identified, sufficient information is available to inform the addition of pollutants to the list of pollutants monitored during outfall monitoring.

Figure B-2. Detailed Aquatic Toxicity Assessment Process

1.4 List of Laboratories Conducting Analysis

The chosen laboratories will be able to meet the measurement quality objectives set forth in **Table B-3.** Laboratories will meet California Environmental Laboratory Accreditation Program (ELAP) and/or National Environmental Laboratory Accreditation Program (NELAP) certifications and any data quality requirements specified in this document. Due to contracting procedures and solicitation requirements, qualified laboratories have not yet been selected to carry out the analytical responsibilities described in this CIMP. Selected laboratories will be listed, per the example shown in **Table B-6**, along with lab certification information. Following the completion of the first monitoring year, the pertinent laboratory specific information will be included in the Integrated Monitoring Compliance Report Section of the Annual Report. At the end of all future monitoring years the SMB JG7 WMP Group will assess the laboratories performance and at that time a new laboratory may be chosen.

Table B-6
Summary of Laboratories Conducting Analysis for the SMB JG7 WMP Group CIMP

Laboratory(1)	General Category of Analysis	Lab Certification No. & Expiration Date(2)

Information for all laboratories will be added to this table following their selection and upon CIMP update.
Lab certifications are renewed on an annual basis.

1.5 Alternate Laboratories

In the event that the laboratories selected to perform analyses for the CIMP are unable to fulfill data quality requirements outlined herein (e.g., due to instrument malfunction), alternate laboratories need to meet the same requirements that the primary labs have met. The original laboratory selected may recommend a qualified laboratory to act as a substitute. However, the final decision regarding alternate laboratory selection rests with the SMB JG7 WMP Group.

Section 2
Sampling Methods and Sample Handling

The sections below discuss the steps to be taken to properly prepare for and initiate water quality sampling for the CIMP.

2.1 Monitoring Event Preparation

Monitoring event preparation includes preparation of field equipment, placing bottle orders, and contacting the necessary personnel regarding site access and schedule. The following steps will be completed two weeks prior to each sampling event (a condensed timeline may be appropriate in storm events, which may need to be completed on short notice):

1. Contact laboratories to order sample containers and to coordinate sample transportation details.
2. Confirm scheduled monitoring date with field crew(s), and set-up sampling day itinerary including sample drop-off.
3. Prepare equipment.
4. Prepare sample container labels and apply to bottles.
5. Prepare the monitoring event summary and field log sheets to indicate the type of field measurements, field observations and samples to be collected at each of the monitoring sites.
6. Verify that field measurement equipment is operating properly (i.e., check batteries, calibrate, etc.)

Table B-7 provides a checklist of field equipment to prepare prior to each monitoring event.

Table B-7
Field Equipment Checklist

☐	Monitoring Plan
☐	Sample Containers plus Extras with Extra Lids
☐	Pre-Printed, Waterproof Labels (extra blank sheets)
☐	Event Summary Sheets
☐	Field Log Sheets
☐	Chain of Custody Forms
☐	Bubble Wrap
☐	Coolers with Ice
☐	Tape Measure
☐	Paper Towels or “Rags in a Box”
☐	Safety Equipment
☐	First Aid Kit
☐	Cellular Telephone
☐	Gate Keys
☐	Hip Waders
☐	Plastic Trash Bags
☐	Sealable Plastic Bags
☐	Grab Pole
☐	Clean Secondary Container(s)
☐	Field Measurement Equipment
☐	New Powder-Free Nitrile Gloves
☐	Writing Utensils
☐	Stop Watch
☐	Camera
☐	Blank Water

2.1.1 Bottle Order/Preparation

Sample container orders will be placed with the appropriate analytical laboratory at least two weeks prior to each sampling event. Containers will be ordered for all water samples, including quality control samples, as well as extra containers in case the need arises for intermediate containers or a replacement. The containers must be the proper type and size and contain preservative as appropriate for the specified laboratory analytical methods.

Table B-4 presents the proper container type, volume, and immediate processing and storage needs. The field crew must inventory sample containers upon receipt from the laboratory to ensure that adequate containers have been provided to meet analytical requirements for each monitoring event. After each event, any bottles used to collect water samples will be cleaned by the laboratory and either picked up by or shipped to the field crew.

2.1.2 Container Labeling and Sample Identification Scheme

All samples will be identified with a unique identification code to ensure that results are properly reported and interpreted. Samples will be identified such that the site, sampling location, matrix, sampling equipment and sample type (i.e., environmental sample or QC sample) can be distinguished by a data reviewer or user. Sample identification codes will consist of a site identification code, a matrix code, and a unique sample identification code. The format for sample identification codes is SM- ###.# - AAAA - XXX, where:

- SM indicates that the sample was collected as part of the SMB JG7 WMP Group CIMP.
- ###- identifies the sequentially numbered monitoring event, and the # is an optional indicator for re-samples collected for the same event. Sample events are numbered from 001 to 999 and will not be repeated.
- AAAA indicates the unique site ID for each site.
- XXX identifies the sample number unique to a sample bottle collected for a single event. Sample bottles are numbered sequentially from 001 to 999 and will not be repeated within a single event.

Alternatively, if the above naming convention is not employed, the selected alterative convention will be consistent between sampling events and sampling stations.

Custom bottle labels should be produced using blank waterproof labels and labeling software. This approach will allow the site and analytical constituent information to be entered in advance and printed as needed prior to each monitoring event. Labels will be placed on the appropriate bottles in a dry environment; applying labels to wet sample bottles should be avoided. Labels should be placed on sides of bottles rather than on bottle caps. All sample containers will be pre-labeled before each sampling event to the extent practicable. Pre-labeling sample containers simplifies field activities, leaving only sample collection time and date and field crew initials to be filled out in the field. Labels should include the following information:

Program Name	Date	Analytical Requirements
Station ID	Collection Time	Preservative Requirements
Sample ID	Sampling Personnel	Analytical Laboratory

2.1.3 Field Meter Calibration

Calibration of field measurement equipment is performed as described in the owner's manuals for each individual instrument. Each individual field crew will be responsible for calibrating their field measurement equipment. Field monitoring equipment must meet the requirements outlined in **Table B-1** and be calibrated before field events based on manufacturer guidance, but at a minimum prior to each event. **Table B-8** outlines the typical field instrument calibration procedures for each piece of equipment requiring calibration. Each calibration will be documented on each event's calibration log sheet (presented in **Appendix D**).

If calibration results do not meet manufacturer specifications, the field crew should first try to recalibrate using fresh aliquots of calibration solution. If recalibration is unsuccessful, new calibration solution should be used and/or maintenance should be performed. Each attempt should be recorded on the equipment calibration log. If the calibration results cannot meet manufacturer's specifications, the field crew should use a spare field measuring device that can be successfully calibrated. If a spare field measuring device that can be successfully calibrated is unavailable, field crews shall note the use of unsuccessfully calibrated equipment on each appropriate field log sheet. Additionally, the SMB JG7 WMP Group should be notified.

Calibration should be verified using at least one calibration fluid within the expected range of field measurements, both immediately following calibration and at the end of each monitoring day. Individual parameters should be recalibrated if the field meters do not measure a calibration fluid within the range of accuracy presented in **Table B-1**. Calibration verification documentation will be retained in the event's calibration verification log.

Table B-8
Calibration of Field Measurement Equipment

Equipment / Instrument	Calibration and Verification Description	Frequency of Calibration	Frequency of Calibration Verification	Responsible Party
pH Probe	Calibration using standard buffer solutions. Use of mid-range buffer to verify successful calibration.	Day prior to or 1st day of sampling event	After calibration and at the end of each sampling day	Individual Sampling Crews
Temperature	Is factory-set and requires no subsequent calibration.			
Dissolved Oxygen Probe	Calibrated using water saturated air environment. DO measurement of water-saturated air will be performed and compared to a standard table of DO concentrations in water as a function of temperature and barometric pressure to verify successful calibration.			
Conductivity	Follow manufacturer's specifications. Use of mid-range conductivity standard to verify successful calibration.			
Turbidity	Follow manufacturer's specifications. Use of mid-range turbidity standard to verify successful calibration.			

2.1.4 Weather Conditions

Monitoring will occur during dry and wet conditions. Dry weather will occur on days with less than 0.1 inch of rain and not within three days after a rain event of 0.1 inch or greater within the watershed, as measured from the closest Los Angeles County controlled rain gauge to the SMB JG7 WMP Group area. Wet weather will be defined as a storm event of greater than or equal to 0.1 inch of precipitation, as determined by the closest Los Angeles County controlled rain gauge to the SMB JG7 WMP Group area.

Note that if rainfall begins after dry weather monitoring has been initiated, then dry weather monitoring will be suspended and continued on a subsequent day when weather conditions meet the dry weather conditions.

The MRP includes specific criteria for the time of monitoring events. For dry weather toxicity monitoring, if triggered, sampling must take place during the historically driest month, which has been determined to be the month of August.

The first significant rain event of the storm year (first flush) will be monitored. The targeted storm events for wet weather sampling will be selected based on a reasonable probability that the events will result in substantially increased flows over at least 12 hours. Sufficient precipitation is needed to produce runoff and increase flow. The decision to sample a storm event will be made in consultation with weather forecasting information services after a quantitative precipitation forecast (QPF) has been determined. All efforts will be made to collect wet weather samples from all sites during a single targeted storm event. However, safety or other factors may make it infeasible to collect samples from a given storm event. For example, storm events that will require field crews to collect wet weather samples during holidays and/or weekends may not be sampled due to sample collection or laboratory staffing constraints.

For a storm to be tracked, the event will have a predicted rainfall of at least 0.25 inches with at least a 70 percent probability of rainfall 24 hours prior to the forecasted time of initial rainfall. Subsequent storm events must meet the tracking requirements, flow objectives, as well as be separated by a minimum of three days of dry weather. Antecedent conditions will be based on the LACDPW rain gage listed in **Table B-9.** Data can be obtained at http://dpw.lacounty.gov/wrd/Precip/index.cfm by clicking the 'See Data' link in the "Near Real-Time Precipitation Map" section. The web page displays a map showing real-time rainfall totals (in inches) for different rain gages. Although the default precipitation period is 24 hours, the user can view rainfall totals over different durations. Data from the rain gages is updated every 10 minutes. Because a significant storm event is based on predicted rainfall, it is recognized that this monitoring may be triggered without 0.25 inches of rainfall actually occurring. In this case, the monitoring event will still qualify as meeting this requirement provided that sufficient sample volume is collected to do all required laboratory analysis. Documentation will be provided showing the predicted rainfall amount.

Table B-9
Real-Time Rain Gage Used to Define Weather Conditions for CIMP Monitoring(1)

Rainfall Gage	Operator	Latitude	Longitude
Fire Station 56 Rolling Hills (376)	Los Angeles County Department of Public Works	33°45'35.25"N	118°21'16"W

[1]Information for the gage can be found at http://dpw.lacounty.gov/wrd/Precip/alertlist.cfm.

The National Weather Service's weather forecast for the SMB JG7 WMP Group area can be accessed on-line at http://www.wrh.noaa.gov/lox/ then click on the location of the SMB JG7 WMP Group area on the area map. From the forecast page, the link to "Quantitative Precipitation Forecast" provides forecasted precipitation in inches for the next 24 hours, in 3-hour increments for the first 12 hours and in 6-hour increments for the last 12 hours.

2.2 Sample Handling

Proper sample handling ensures the samples will comply with the monitoring methods and analytical hold time and provides traceable documentation throughout the history of the sample.

2.2.1 Documentation Procedures

The SMB JG7 WMP Group is responsible for ensuring that each field sampling team adheres to proper custody and documentation procedures. Field log sheets documenting sample collection and other monitoring activities for each site will be bound in a separate master logbook for each event. Alternatively, all measurements could be collected on an electronic device such as laptop or tablet computer. Field personnel have the following responsibilities:

1. Keep an accurate written record of sample collection activities on the field log sheets.
2. Ensure that all field log sheet entries are legible and contain accurate and inclusive documentation of all field activities.
3. Note errors or changes using a single line to cross out the entry and date and initial the change.
4. Ensure that a label is affixed to each sample collected and that the labels uniquely identify samples with a sample ID, site ID, date and time of sample collection and the sampling crew initials.
5. Complete the chain of custody forms accurately and legibly.

2.2.2 Field Documentation/Field Log

Field crews will keep a field log book for each sampling event that contains a calibration log sheet, a field log sheet for each site, and appropriate contact information. Alternatively, all measurements could be collected on an electronic device such as laptop or tablet computer. The following items should be recorded on the field log sheet for each sampling event:

- Monitoring station location (Station ID);
- Date and time(s) of sample collection;
- Name(s) of sampling personnel;
- Sample collection depth;
- Sample ID numbers and unique IDs for any replicate or blank samples;
- QC sample type (if appropriate);
- Requested analyses (specific parameters or method references);
- Sample type (e.g., grab or composite);
- The results of field measurements (e.g., flow, temperature, dissolved oxygen, pH, conductivity, turbidity) and the time that measurements were made;
- Qualitative descriptions of relevant water conditions (e.g., water color, flow level, clarity) or weather (e.g., wind, rain) at the time of sample collection;
- Trash observations (presence/absence);
- A description of any unusual occurrences associated with the sampling event, particularly those that may affect sample or data quality.

The field log will be scanned into a PDF within one week of the conclusion of each sampling event. Alternatively, all measurements could be collected on an electronic device such as laptop or tablet computer. **Appendix D** contains an example of the field log sheet.

2.2.3 Sample Handling and Shipment

The field crews will maintain custody of samples during each monitoring event. Chain-of-custody (COC) forms will accompany all samples during shipment to contract laboratories to identify the shipment contents. All water quality samples will be transported to the analytical laboratory by the field crew or by courier. The original COC form will accompany the shipment, and a signed copy of the COC form will be sent, typically via email or fax, by the laboratory to the field crew to be retained in the project file.

While in the field, samples will be stored on ice in an insulated container. Samples that must be shipped to the laboratory must be examined to ensure that container lids are tight and placed on ice to maintain the appropriate temperature. The ice packed with samples must be approximately 2 inches deep at the top and bottom of the cooler, and must contact each sample to maintain temperature. The original COC form(s) will be double-bagged in re-sealable plastic bags and either taped to the outside of the cooler or to the inside lid. Samples must be shipped to the contract laboratory according to transportation standards. The method(s) of shipment, courier name, and other pertinent information should be entered in the "Received By" or "Remarks" section of the COC form.

Coolers must be sealed with packing tape before shipping, unless transported by field or lab personnel, and must not leak. It is assumed that samples in tape-sealed ice chests are secure whether being transported by common carrier or by commercial package delivery. The laboratory's sample receiving department will examine the shipment of samples for correct documentation, proper preservation and compliance with holding times.

The following procedures are used to prevent bottle breakage and cross-contamination:

- Bubble wrap or foam pouches are used to keep glass bottles from contacting one another to prevent breakage, re-sealable bags will be used if available.
- All samples are transported inside hard plastic coolers or other contamination-free shipping containers.
- If arrangements are not made in advance, the laboratory's sample receiving personnel must be notified prior to sample shipment.

All samples remaining after successful completion of analyses will be disposed of properly. It is the responsibility of the personnel of each analytical laboratory to ensure that all applicable regulations are followed in the disposal of samples or related chemicals. Samples will be stored and transported as noted in **Table B-4**. Samples not analyzed locally will be sent on the same day that the sample collection process is completed, if possible. Samples will be delivered to the appropriate laboratory as will be indicated in **Table B-10**. Note that due to procurement procedures, the analytical laboratories have not been identified at this time. Information for all laboratories will be added to this table following their selection. All appropriate contacts will be listed along with lab certification information in **Table B-10**.

Table B-10
Information on Laboratories Conducting Analysis for the SMB JG7 WMP Group CIMP

Laboratory[1]	General Category of Analysis	Shipping Method	Contact	Phone	Address	Lab Certification No. & Expiration Date[2]
Information for all laboratories will be added to this table following their selection and upon CIMP update. Lab certifications are renewed on an annual basis.						

2.2.4 Chain-of Custody Forms

Sample custody procedures provide a mechanism for documenting information related to sample collection and handling. Sample custody must be traceable from the time of sample collection until results are reported. A sample is considered under custody if:

- It is in actual possession.
- It is in view after in physical possession.
- It is placed in a secure area (accessible by or under the scrutiny of authorized personnel only after in possession).

A COC form must be completed after sample collection and prior to sample shipment or release. The COC form, sample labels, and field documentation will be cross-checked to verify sample identification, type of analyses, number of containers, sample volume, preservatives, and type of containers. A complete COC form is to accompany the transfer of samples to the analyzing laboratory. A typical COC form is presented in **Appendix D**.

2.2.5 Laboratory Custody Procedures

Laboratories will follow sample custody procedures as outlined in the laboratory's Quality Assurance (QA) Manual. A copy of each contract laboratory's QA Manual should be available at the laboratory upon request. Laboratories shall maintain custody logs sufficient to track each sample submitted and to analyze or preserve each sample within specified holding times. The following sample control activities must be conducted at the laboratory:

- Initial sample login and verification of samples received with the COC form;
- Document any discrepancies noted during login on the COC;
- Initiate internal laboratory custody procedures;
- Verify sample preservation (e.g., temperature);
- Notify the SMB JG7 WMP Group if any problems or discrepancies are identified; and,
- Perform proper sample storage protocols, including daily refrigerator temperature monitoring and sample security.

Laboratories shall maintain records to document that the above procedures are followed. Once samples have been analyzed, samples will be stored at the laboratory for at least 60 days. After this period, samples may be disposed of properly.

2.3 Field Protocols

Briefly, the key aspects of quality control associated with field protocols for sample collection for eventual chemical and toxicological analyses are as follows:

1. Field personnel will be thoroughly trained in the proper use of sample collection gear and will be able to distinguish acceptable versus unacceptable water samples in accordance with pre-established criteria.
2. Field personnel will be thoroughly trained to recognize and avoid potential sources of sample contamination (e.g., engine exhaust, ice used for cooling).
3. Sampling gear and utensils which come in direct contact with the sample will be made of non-contaminating materials (e.g., borosilicate glass, high-quality stainless steel and/or Teflon™, according to protocol) and will be thoroughly cleaned between sampling stations according to appropriate cleaning protocol (rinsing thoroughly at minimum).
4. Sample containers will be of the recommended type and will be free of contaminants (i.e., pre-cleaned).
5. Conditions for sample collection, preservation, and holding times will be followed.

Field crews will be comprised of a minimum of two persons per crew.. To ensure safety, field crews will have the PPE. Other constraints on sampling events include, but are not limited to, lab closures and toxicity testing organism availability. Sampling events should proceed in the following manner:

1. Before leaving the sampling crew base of operations, confirm number and type of sample containers as well as the complete equipment list.
2. Proceed to the first sampling site.
3. Fill-out the general information on the field log sheet.
4. Collect the environmental and quality assurance/quality control (QA/QC) samples indicated on the event summary sheet and store samples appropriately. Using the field log sheet, confirm that all appropriate containers were filled.
5. Collect field measurements and observations, and record these on the field log sheet.
6. Repeat the procedures in steps 3, 4, and 5 for each of the remaining sampling sites.
7. Complete the COC forms using the information on the field log sheets.
8. After sample collection is completed, deliver and/or ship samples to appropriate laboratory.

2.4 Sample Collection

All samples will be collected in a manner appropriate for the specific analytical methods to be used. The proper sampling techniques, outlined in this section, will ensure that the collected samples are representative of the waterbodies sampled. Should field crews feel that it is unsafe to collect samples for any reason, the field crews **SHOULD NOT COLLECT** a sample and note on the field log that the sample was not collected, why the sample was not collected, and provide photo documentation, if feasible.

2.4.1 Overview of Sampling Techniques

As described below, the method used to collect water samples is dependent on the depth, flow, and sampling location (receiving water, outfall). Nonetheless, in all cases:

1. Throughout each sample collection event, the sampler should exercise aseptic techniques (i.e., do not touch the inner surfaces or lip edges of the sample bottle or cap).
2. The sampler should use clean, powder-free, nitrile gloves for each site to prevent contamination.
3. When collecting the sample, the sampler should not breathe, sneeze, or cough in the direction of the container.
4. Gloves should be changed if they are soiled, or if the potential for cross-contamination exists from handling sampling materials or samples.
5. While the sample is collected, the bottle lid shall not be placed on the ground.
6. The sampler should not eat or drink during sample collection.
7. The sampler should not smoke during sample collection.
8. Each person on the field crew should wear clean clothing that is free of dirt, grease, or other substances that could contaminate the sampling apparatus or sample bottles.
9. Sampling should not occur near a running vehicle. Vehicles should not be parked within the immediate sample collection area, when possible, even non-running vehicles.
10. When the sample is collected, ample air space should be left in the bottle to facilitate mixing by shaking for lab analysis, unless otherwise required by the method.
11. After the sample is collected and the cap is tightly screwed back on the bottle, the time of sampling should be recorded on the field log sheet.
12. Any QA/QC samples that are collected should be also be noted on the field log sheet and labeled according the convention described in **Section 2.1** of this Attachment.
13. Samples should be stored as previously described.
14. COC forms should be filled out as described in **Section 2.2** of this Attachment and delivered to the appropriate laboratory as soon as feasible to ensure hold times are met.

To prevent contamination of samples, clean metal sampling techniques using USEPA protocols outlined in USEPA Method 1669[2] will be used throughout all phases of the water sample collection. The protocol for clean metal sampling, based on USEPA Method 1669, is summarized below:

1. Samples are collected in rigorously pre-cleaned sample bottles with any tubing specially processed to clean sampling standards.
2. At least two persons, wearing clean, powder-free nitrile or latex gloves at all times, are required on a sampling crew.

2 USEPA. April 1995. *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels.* EPA 821-R-95-034.

3. One person, referred to as "dirty hands", opens only the outer bag of all double-bagged sample bottles.
4. The other person, referred to as "clean hands", reaches into the outer bag, opens the inner bag and removes the clean sample bottle.
5. Clean hands rinses the bottle at least two times by submerging the bottle, removing the bottle lid, filling the bottle approximately one-third full, replacing the bottle lid, gently shaking and then emptying the bottle. Clean hands then collects the sample by submerging the bottle, removing the lid, filling the bottle and replacing the bottle cap while the bottle is still submerged.
6. After the sample is collected, the sample bottle is double-bagged in the opposite order from which it was removed from the same double-bagging.
7. Clean, powder-free gloves are changed whenever something not known to be clean has been touched.

2.4.2 Field Measurements and Observations

Field measurements will be collected and observations made at each sampling site during sample collection. Field measurements will include the parameters identified in the CIMP for which a laboratory analysis is not being conducted. Field monitoring equipment must meet the requirements outlined in **Table B-3**. All field measurement results and field observations will be recorded on a field log sheet similar to the one presented in **Appendix D** and as described in **Section 2.2** of this Attachment.

Measurements (except for flow) will be collected at approximately mid-stream, mid-depth at the location of greatest flow (if feasible) with a Hydrolab DS4 multi-probe meter, or comparable instrument(s). If at any time the collection of field measurements by wading appears to be unsafe, field crews will not attempt to collect mid-stream, mid-depth measurements. Rather, field measurements will be made either directly from a stable, unobstructed area at the channel edge, or by using a telescoping pole and intermediate container to obtain a sample for field measurements and for filling sample containers. For situations where flows are not sufficiently deep to submerge the probes, an intermediate container will be utilized. The location of field measurements will be documented on the field log sheet.

Flow measurements will be collected as outlined in the following subsections at freshwater receiving water and non-stormwater outfall monitoring sites. Regardless of measurement technique used, if a staff gage is present the gage height will be noted. Field crews may not be able to measure flow at several sites during wet weather because of inaccessibility of the site. If this is the case, site inaccessibility will be documented on the field log sheet.

The field sampling crew has the primary responsibility for responding to failures in the sampling or measurement systems. Deviations from established monitoring protocols will be documented in the comment section of the field log sheet and noted in the post event summaries. If monitoring equipment fails, monitoring personnel will report the problem in the notes section of the field log sheet and will not record data values for the variables in question. Broken equipment will be replaced or repaired prior to the next field use. Data collected using faulty equipment will not be used.

2.4.2.1 *Velocity Meter Flow Measurements*

For sampling sites where water is deep enough (>0.1-foot) a velocity meter will be utilized. For these cases, velocity will be measured at approximately equal increments across the width of the flowing water using a Marsh-McBirney Flo-Mate® velocity meter3 or equivalent, which uses an electromagnetic velocity sensor. A "flow pole" will be used to measure the water depth at each measurement point and to properly align the sensor so that the depth of each velocity measurement is approximately equal to 0.6 *

3 For more information, see http://marsh-mcbirney.com/Products/2000.htm

total depth, which is representative of the average velocity. The distance between velocity measurements taken across the stream is dependent on the total width. No more than 10% of the flow will pass through any one cross section.

2.4.2.2 *Shallow Sheet Flow Measurements*

If the depth of flow does not allow for the measurement of flow with a velocity meter (<0.1-foot) a “float” will be used to measure the velocity of the flowing water. The width, depth, velocity, cross section, and corresponding flow rate will be estimated as follows:

- **Sheet flow width:** The width (W) of the flowing water (not the entire part of the channel that is damp) is measured at the “top”, “middle”, and “bottom” of a marked-off distance – generally 10 feet (e.g., for a 10-foot marked-off section, $W_{Top} W_{Top}$ is measured at 0-feet, $W_{Mid}\ W_{Mid}$ is measured at 5 feet, and $W_{Bottom}\ W_{Bottom}$ is measured at 10 feet).
- **Sheet flow depth:** The depth of the sheet flow is measured at the top, middle, and bottom of the marked-off distance. Specifically, the depth (D) of the sheet flow is measured at 25%, 50%, and 75% of the flowing width (e.g., $D_{50\%}^{Mid}\ D_{50\%}^{Mid}$ is the depth of the water at middle of the section in the middle of the sheet flow) at each of the width measurement locations. It is assumed that the depth at the edge of the sheet flow (i.e., at 0% and 100% of the flowing width) is zero.
- **Representative cross-section:** Based on the collected depth and width measurements, the representative cross-sectional area across the marked-off sheet flow is approximated as follows:

$$\text{Re}\mathit{presentative\ Cross\ Section} =$$

$$\mathit{Average}\ \{[\frac{W_{Top}}{4} \times (\frac{D_{25\%}^{Top}}{2} + \frac{(D_{50\%}^{Top} + D_{25\%}^{Top})}{2} + \frac{(D_{75\%}^{Top} + D_{50\%}^{Top})}{2} + \frac{D_{75\%}^{Top}}{2})],$$
$$[\frac{W_{Mid}}{4} \times (\frac{D_{25\%}^{Mid}}{2} + \frac{(D_{50\%}^{Mid} + D_{25\%}^{Mid})}{2} + \frac{(D_{75\%}^{Mid} + D_{50\%}^{Mid})}{2} + \frac{D_{75\%}^{Mid}}{2})],$$
$$[\frac{W_{Bottom}}{4} \times (\frac{D_{25\%}^{Bottom}}{2} + \frac{(D_{50\%}^{Bottom} + D_{25\%}^{Bottom})}{2} + \frac{(D_{75\%}^{Bottom} + D_{50\%}^{Bottom})}{2} + \frac{D_{75\%}^{Bottom}}{2})]\}$$

$$\text{Re}\mathit{presentative\ Cross\ Section} =$$

$$\mathit{Average}\ \{[\frac{W_{Top}}{4} \times (\frac{D_{25\%}^{Top}}{2} + \frac{(D_{50\%}^{Top} + D_{25\%}^{Top})}{2} + \frac{(D_{75\%}^{Top} + D_{50\%}^{Top})}{2} + \frac{D_{75\%}^{Top}}{2})],$$
$$[\frac{W_{Mid}}{4} \times (\frac{D_{25\%}^{Mid}}{2} + \frac{(D_{50\%}^{Mid} + D_{25\%}^{Mid})}{2} + \frac{(D_{75\%}^{Mid} + D_{50\%}^{Mid})}{2} + \frac{D_{75\%}^{Mid}}{2})],$$
$$[\frac{W_{Bottom}}{4} \times (\frac{D_{25\%}^{Bottom}}{2} + \frac{(D_{50\%}^{Bottom} + D_{25\%}^{Bottom})}{2} + \frac{(D_{75\%}^{Bottom} + D_{50\%}^{Bottom})}{2} + \frac{D_{75\%}^{Bottom}}{2})]\}$$

- **Sheet flow velocity:** Velocity is calculated based on the amount of time it took a float to travel the marked-off distance (typically 10-feet or more). Floats are normally pieces of leaves, litter, or floatables (suds, etc.). The time it takes the float to travel the marked-off distance is measured at least three times. Then average velocity is calculated as follows:

$$\mathit{Average\ Surface\ Velocity} = \frac{\mathit{Distance\ Marked\ off\ for\ Float\ Measurement}}{\mathit{Average\ Time\ for\ Float\ to\ Travel\ Marked\ off\ Distance}}$$

- **Flow Rate calculation:** For sheet flows, based on the above measurements/estimates, the estimated flow rate, Q, is calculated by:

  Q = f x (Representative Cross Section) x (Average Surface Velocity)

The coefficient f is used to account for friction effects of the channel bottom. That is, the float travels on the water surface, which is the most rapidly-traveling portion of the water column. The average velocity, not the surface velocity, determines the flow rate, and thus f is used to "convert" surface velocity to average velocity. In general, the value of f typically ranges from 0.60 – 0.90 (USGS 1982). Based on flow rate measurements taken during the LA River Bacteria Source Identification Study (CREST 2008) a value of 0.75 will be used for f.

2.4.2.3 *Free-flowing outfalls*

Some storm drain outfalls are free-flowing, meaning the runoff falls from an elevated outfall into the channel, which allows for collection of the entire flowing stream of water into a container of known volume (e.g., graduated bucket or graduated Ziploc bag). The time it takes to fill the known volume is measured using a stopwatch, and recorded on the field log. The time it takes to fill the container will be measured three times and averaged to ensure that the calculated discharge is representative. In some cases, a small portion of the runoff may flow around or under the container. For each measurement, "percent capture", or the proportion of flow estimated to enter the bucket, will be recorded. For free-flowing outfalls, the estimated flow rate, Q, is calculated by:

$$Q = Average\ \left[\frac{Filled\ \ container\ \ Volume}{(Time\ \ to\ Fill\ \ Container\ )\times(Estimated\ \ \ Capture\ )}\right]$$

$$Q = Average\ \left[\frac{Filled\ \ container\ \ Volume}{(Time\ \ to\ Fill\ \ Container\ )\times(Estimated\ \ \ Capture\ )}\right]$$

Based on measurements of free-flowing outfalls during the LA River Bacteria Source Identification Study (CREST, 2008), estimated capture typically ranges from 0.75 – 1.0.

2.4.3 Sampling Techniques for the Collection of Water

The following subsections provide details on the various techniques that can be utilized to collect water quality samples. Should field crews feel that it is unsafe to collect samples for any reason, the field crews **SHOULD NOT COLLECT** a sample and note on the field log that the sample was not collected, why the sample was not collected, and provide photo documentation, if feasible.

2.4.3.1 *Direct Submersion: Hand Technique*

Where practical, all grab samples will be collected by direct submersion at mid-stream, mid-depth using the following procedures:

1. Follow the standard sampling procedures described in **Section 2.4.1** of this Attachment.
2. Remove the lid, submerge the container to mid-stream/mid-depth, let the container fill and secure the lid. In the case of mercury samples, remove the lid underwater to reduce the potential for contamination from the air.
3. Place the sample on ice.

4. Collect the remaining samples including quality control samples, if required, using the same protocols described above.
5. Follow the sample handling procedures described in **Section 2.2** of this Attachment.

2.4.3.2 *Intermediate Container Technique*

Samples may be collected with the use of a clean intermediate container, if necessary, following the steps listed below. An intermediate container may include a container that is similar in composition to the sample container, a pre-cleaned pitcher made of the same material as the sample container, or a Ziploc bag. An intermediate container should not be reused at a different site without appropriate cleaning.

1. Follow the standard sampling procedures described in **Section 2.4.1** of this Attachment.
2. Submerge the intermediate container to mid-stream/mid-depth (if possible), let the container fill, and quickly transfer the sample into the individual sample container(s) and secure the lid(s).
3. Place the sample(s) on ice.
4. Collect remaining samples including quality control samples, if required, using the same protocols described above.
5. Follow the sample handling procedures described in **Section 2.2** of this Attachment.

Some flows may be too shallow to fill a container without using an intermediate container. When collecting samples from shallow sheet flows it is very important to not scoop up algae, sediment, or other particulate matter on the bottom because such debris is not representative of flowing water. To prevent scooping up such debris either: (1) find a spot where the bottom is relatively clean and allow the sterile intermediate container to fill without scooping; or (2) lay a clean sterile Ziploc® bag on the bottom and collect the water sample from on top of the bag. A fresh Ziploc® bag must be used at each site.

2.4.3.3 *Pumping*

Samples may be collected with the use of a peristaltic pump and specially cleaned tubing following the steps listed below. Sample tubing should not be reused at a different site without appropriate cleaning.

1. Follow the standard sampling procedures described in **Section 2.4.1** of this Attachment.
2. Attach pre-cleaned tubing into the pump, exercising caution to avoid allowing tubing ends to touch any surface known not to be clean. A separate length of clean tubing must be used at each sample location for which the pump is used.
3. Place one end of the tubing below the surface of the water. To the extent possible, avoid placing the tubing near the bottom so that settled solids are not pumped into the sample container.
4. Hold the other end of the tubing over the opening of the sample container, exercising care not to touch the tubing to the sample container.
5. Pump the necessary sample volume into the sample container and secure the lid.
6. Place the sample on ice.
7. Collect remaining samples including quality control samples, if required, using the same protocols described above.
8. Follow the sample handling procedures described in **Section 2.2** of this Attachment.

2.4.3.4 *Autosamplers*

Automatic sample compositors (autosamplers) are used to characterize the entire flow of a storm in one analysis. They can be programmed to take aliquots at either time- or flow-based specified intervals. Before beginning setup in the field, it is recommended to read the manufacturer's instructions. The general steps to set up the autosampler are described below:

1. Connect power source to autosampler computer. This can be in the form of a battery or a power cable.
2. Install pre-cleaned tubing into the pump. Clean tubing will be used at each site and for each event, in order to minimize contamination.
3. Attach strainer to intake end of the tubing and install in sampling channel.
4. If running flow based composite samples; install flow sensor in sampling channel and connect it to the automatic compositor.
5. Label and install composite bottle(s). If sampler is not refrigerated, then add enough ice to the composite bottle chamber to keep sample cold for the duration of sampling or until such time as ice can be refreshed. Make sure not to contaminate the inside of the composite bottle with any of the ice.
6. Program the autosampler as per the manufacturer's instructions and make sure the autosampler is powered and running before leaving the site.

After the sample collection is completed the following steps must be taken to ensure proper sample handling:

1. Upon returning to the site, check the status of the autosampler and record any errors or missed samples. Note on the field log the time of the last sample, as this will be used for filling out the COCs.
2. Remove the composite bottle and store on ice. If dissolved metals are required, then begin the sample filtration process outlined in the following subsection, within 15 minutes of the last composite sample, unless compositing must occur at another location, in which case the filtration process should occur as soon as possible upon sample compositing.
3. Power down autosampler and leave sampling site.
4. The composite sample will need to be split into the separate analysis bottles either before being shipped to the laboratory or at the laboratory. This is best done in a clean and weatherproof environment, using clean sampling technique.

2.4.3.5 *Dissolved Metals Field Filtration*

Samples for dissolved metals will be filtered by the laboratory, or in the event samples for dissolved metals are required to be filtered in the field, the following method for dissolved field filtration will be conducted. A peristaltic pump or 50mL plastic syringe with a 0.45µm filter attached will be used to collect and filter the dissolved metals sample in the field. The apparatus will either come certified pre-cleaned from the manufacturer and confirmed by the analytical laboratory or be pre-cleaned by and confirmed by the analytical laboratory at least once per year. The apparatus will be double bagged in Ziploc plastic bags. Alternative an equivalent method may be utilized, if necessary.

To collect the sample for dissolved metals, first collect the total metals sample using clean sampling techniques. The dissolved sample will be taken from this container. Immediately prior to collecting the dissolved sample, shake the total metals sample. To collect the dissolved metals sample using clean sampling techniques, remove the syringe from the bag and place the tip of the syringe into the bottle containing the total metals sample and draw up 50 mL of sample into the syringe. Next, remove the filter from the zip-lock bag and screw it tightly into the tip of the syringe. Then put the tip of the syringe with the filter into the clean dissolved metals container and push the sample through the filter taking care not to touch the inside surface of the sample container with the apparatus. The sample volume needs to be a minimum of 20 mL. If the filter becomes clogged prior to generating 20 mL of sample, remove and dispose of the used filter and replace it with a new clean filter (using the clean sampling techniques).

Continue to filter the sample. When 20 mL has been collected, cap the sample bottle tightly and store on ice for delivery to the laboratory.

2.4.4 Receiving Water Sample Collection

A grab sample is a discrete individual sample. A composite sample is a mixture of samples collected over a period of time either as time or flow weighted. A time-weighted composite is created by mixing multiple aliquots collected at specified time intervals. A flow-weighted composite is created by mixing multiple aliquots collected at equal time intervals but where the volume of the aliquot is based on flow rate. Generally, grab samples will be collected during dry weather and composite samples will be collected during wet weather. Should field crews feel that it is unsafe to collect samples for any reason, the field crews **SHOULD NOT COLLECT** a sample and note on the field log that the sample was not collected, why the sample was not collected, and provide photo documentation, if feasible.

Grab samples will be used for dry weather sampling events, if triggered, because the composition of the receiving water will change less over time; and thus, the grab sample can sufficiently characterize the receiving water. Grab samples will be collected as described in **Section 2.4.3** of this Attachment. Monitoring site configuration and consideration of safety will dictate grab sample collection technique. The potential exists for monitoring sites to lack discernable flow. The lack of discernable flow may generate unrepresentative data. To address the potential confounding interference that can occur under such conditions, sites sampled should be assessed for the following conditions and sampled or not sampled accordingly:

- Pools of water with no flow or no visible connection to another surface water body should not be sampled. The field log should be completed for non-water quality data (including date and time of visit) and the site condition should be photo-documented.
- Flowing water (i.e., based on visual observations, flow measurements, and a photo-documented assessment of conditions immediately upstream and downstream of the sampling site) site should be sampled.

Wet weather receiving water samples collected from the Santa Monica Bay by boat will be single grab sample.

It is the combined responsibility of all members of the sampling crew to determine if the performance requirements of the specific sampling method have been met, and to collect additional samples if required. If the performance requirements outlined above or documented in sampling protocols are not met, the sample will be re-collected. If contamination of the sample container is suspected, a fresh sample container will be used. The SMB JG7 WMP Group will be contacted if at any time the sampling crew has questions about procedures or issues based on site-specific conditions.

2.4.5 Stormwater Outfall Sample Collection

Wet weather samples will generally be collected as either time- or flow-weighted composites at outfalls. Grab samples may be utilized to collect wet weather samples in certain situations, which may include, but are not limited to, situations where it is unsafe to collect composite samples or to perform investigative monitoring where composite sampling or installation of an auto-sampler may not be warranted. . Sampling will not be undertaken if the outfalls are not flowing or if conditions exist where the receiving water is back-flowing into the outfall. It is the combined responsibility of all members of the sampling crew to determine if the performance requirements of the specific sampling method have been met, and to collect additional samples if required. If the performance requirements outlined above or documented in sampling protocols are not met, the sample will be re-collected. If contamination of the sample container is suspected, a fresh sample container will be used. The SMB JG7 WMP Group will be contacted if at any time the sampling crew has questions about procedures or issues based on site-specific conditions.

2.4.6 Non-Stormwater Outfall Screening Surveys and Sample Collection

The outfall screening process is designed to identify outfalls that have significant non-stormwater (NSW) discharges. The collection of water quality data will support the determination of significant NSW discharges as well as to characterize dry weather loading.

Preparation for Outfall Surveys

Preparation for outfall surveys includes preparation of field equipment, placing bottle orders, and contacting the necessary personnel regarding site access and schedule. The following steps should be completed two weeks prior to each outfall survey:

1. Check weather reports and LACDPW rain gage to ensure that antecedent dry weather conditions are suitable.
2. Contact appropriate Flood Maintenance Division personnel from LACDPW to notify them of dates and times of any activities in flood control channels.
3. Contact laboratories to order bottles and to coordinate sample pick-ups.
4. Confirm scheduled sampling date with field crews.
5. Set-up sampling day itinerary including sample drop-offs and pick-ups.
6. Compile field equipment.
7. Prepare sample labels.
8. Prepare event summaries to indicate the type of field measurements, field observations, and samples to be taken at each of the outfalls.
9. Prepare COCs.
10. Charge the batteries of field tablets (if used).

2.4.6.1 *Non-Stormwater Sample Collection*

Water quality samples will be collected consistent with the dry weather requirements outlined in the receiving water monitoring section using the direct submersion, intermediate container, shallow sheet flow, or pumping methods described in **Section 2.4.3** of this Attachment.

2.4.7 Stormborne Sediment Collection

No sediment collection sampling would be conducted under this program in the receiving waters as data from Santa Monica Canyon, as part of the JG2JG3 CIMP, will be evaluated for TMDL compliance.

2.4.8 Bioaccumulation Sample Collection

No bioaccumulation sampling will be conducted under this program.

2.4.9 Trash Monitoring

The SMB JG7 WMP Group members are implementing the Santa Monica Marine Debris TMDLs through the installation of full capture devices. As such, no specific monitoring is required or will be conducted for the Marine Debris TMDLs for these jurisdictions.

2.4.10 Plastic Pellet Monitoring

Manufacturers of plastic pellets were not identified within any of the SMB JG7 WMP Group's jurisdictional area, and monitoring for plastic pellets at the MS4 is not required. Appropriate actions for emergency spills and special circumstances for safety considerations are addressed for each jurisdiction.

2.4.11 Quality Control Sample Collection

Quality control samples will be collected in conjunction with representative samples to verify data quality. Quality control samples collected in the field will generally be collected in the same manner as environmental samples. Detailed descriptions of quality control samples are presented in **Section 3** of this Attachment.

Section 3
Quality Assurance/Quality Control

This section describes the quality assurance and quality control requirements and processes. Quality control samples will be collected in conjunction with environmental samples to verify data quality. Additional detail on data quality is provided in Section 13 (QA/QC Data Evaluation) of the *Caltrans Comprehensive Protocols Guidance Manual* (2000)[4]. Quality control samples collected in the field will generally be collected in the same manner as environmental samples. There are no requirements for quality control for field analysis of general parameters (e.g., temperature, pH, conductivity, dissolved oxygen, and pH) outlined in the SWAMP. However, field crews will be required to calibrate equipment as outlined previously. **Table B-11** presents the quality assurance parameter addressed by each quality assurance requirement as well as the appropriate corrective action if the acceptance limit is exceeded.

Table B-11
Quality Control Requirements

Quality Control Sample Type	QA Parameter	Frequency(1)	Acceptance Limits	Corrective Action
Quality Control Requirements – Field				
Equipment Blanks	Contamination	5% of all samples(2)	< MDL	Identify equipment contamination source. Qualify data as needed.
Field Blank	Contamination	5% of all samples	< MDL	Examine field log. Identify contamination source. Qualify data as needed.
Field Duplicate	Precision	5% of all samples	RPD < 25% if |Difference| > RL	Reanalyze both samples if possible. Identify variability source. Qualify data as needed.
Quality Control Requirements – Laboratory				
Method Blank	Contamination	1 per analytical batch	< MDL	Identify contamination source. Reanalyze method blank and all samples in batch. Qualify data as needed.
Lab Duplicate	Precision	1 per analytical batch	RPD < 25% if |Difference| > RL	Recalibrate and reanalyze.
Matrix Spike	Accuracy	1 per analytical batch	80-120% Recovery for GWQC 75-125% for Metals 50-150% Recovery for Pesticides (3)	Check LCS/CRM recovery. Attempt to correct matrix problem and reanalyze samples. Qualify data as needed.
Matrix Spike	Precision	1 per analytical	RPD < 30% if	Check lab duplicate RPD. Attempt

[4] http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-03-105.pdf

Quality Control Sample Type	QA Parameter	Frequency(1)	Acceptance Limits	Corrective Action
Duplicate		batch	|Difference| > RL	to correct matrix problem and reanalyze samples. Qualify data as needed.
Laboratory Control Sample (or CRM or Blank Spike)	Accuracy	1 per analytical batch	80-120% Recovery for GWQC	Recalibrate and reanalyze LCS/ CRM and samples.
			75-125% for Metals	
			50-150% Recovery for Pesticides (3)	
Blank Spike Duplicate	Precision	1 per analytical batch	RPD < 25% if |Difference| > RL	Check lab duplicate RPD. Attempt to correct matrix problem and reanalyze samples. Qualify data as needed.
Surrogate Spike (Organics Only)	Accuracy	Each environmental and lab QC sample	30-150% Recovery3	Check surrogate recovery in LCS. Attempt to correct matrix problem and reanalyze sample. Qualify data as needed.

MDL = Method Detection Limit   RL = Reporting Limit   RPD = Relative Percent Difference
LCS = Laboratory Control Sample/Standard   CRM = Certified/ Standard Reference Material
GWQC = General Water Quality Constituents

1. "Analytical batch" refers to a number of samples (not to exceed 20 environmental samples plus the associated quality control samples) that are similar in matrix type and processed/prepared together under the same conditions and same reagents (equivalent to preparation batch).
2. Equipment blanks will be collected by the field crew before using the equipment to collect sample.
3. Or control limits set at + 3 standard deviations based on actual laboratory data.

3.1 QA/QC Requirements and Objectives

3.1.1 Comparability

Comparability of the data can be defined as the similarity of data generated by different monitoring programs. For this monitoring program, this objective will be ensured mainly through use of standardized procedures for field measurements, sample collection, sample preparation, laboratory analysis, and site selection; adherence to quality assurance protocols and holding times; and reporting in standard units. Additionally, comparability of analytical data will be addressed through the use of standard operating procedures and extensive analyst training at the analyzing laboratory.

3.1.2 Representativeness

Representativeness can be defined as the degree to which the environmental data generated by the monitoring program accurately and precisely represent actual environmental conditions. For the CIMP, this objective will be addressed by the overall design of the program. Representativeness is attained through the selection of sampling locations, methods, and frequencies for each parameter of interest, and by maintaining the integrity of each sample after collection. Sampling locations were chosen that are representative of various areas within the watershed and discharges from the MS4, which will allow for the characterization of the watershed and impacts MS4 discharges may have on water quality.

3.1.3 Completeness

Data completeness is a measure of the amount of successfully collected and validated data relative to the amount of data planned to be collected for the project. It is usually expressed as a percentage value. A project objective for percent completeness is typically based on the percentage of the data needed for the program or study to reach valid conclusions.

Because the CIMP is intended to be a long term monitoring program, data that are not successfully collected during a specific sample event will not be recollected at a later date. Rather subsequent events conducted over the course of the monitoring will provide robust data sets to appropriately characterize conditions at individual sampling sites and the watershed in general. For this reason, most of the data planned for collection cannot be considered absolutely critical, and it is difficult to set a meaningful objective for data completeness.

However, some reasonable objectives for data are desirable, if only to measure the effectiveness of the program when conditions allow for the collection of samples (i.e., flow is present). The program goals for data completeness, shown in **Table B-3**, are based on the planned sampling frequency, SWAMP recommendations, and a subjective determination of the relative importance of the monitoring element within the CIMP. If, however, sampling sites do not allow for the collection of enough samples to provide representative data due to conditions (i.e., no flow) alternate sites will be considered. Data completeness will be evaluated on a yearly basis.

3.2 QA/QC Field Procedures

Quality control samples to be prepared in the field will consist of equipment blanks, field blanks, and field duplicates as described below.

3.2.1 Equipment Blanks

The purpose of analyzing equipment blanks is to demonstrate that sampling equipment is free from contamination. Equipment blanks will be collected by the analytical laboratory responsible for cleaning equipment and analyzed for relevant pollutants before sending the equipment to the field crew. Equipment blanks will consist of laboratory-prepared blank water (certified to be contaminant-free by the laboratory) processed through the sampling equipment that will be used to collect environmental samples.

The equipment blanks will be analyzed using the same analytical methods specified for environmental samples. If any analytes of interest are detected at levels greater than the MDL, the source(s) of contamination will be identified and eliminated (if possible), the affected batch of equipment will be re-cleaned, and new equipment blanks will be prepared and analyzed before the equipment is returned to the field crew for use.

3.2.2 Field Blanks

The purpose of analyzing field blanks is to demonstrate that sampling procedures do not result in contamination of the environmental samples. Per the Quality Assurance Management Plan for SWAMP (SWRCB, 2008) field blanks are to be collected as follows:

- At a frequency of 5% of samples collected for the following constituents: trace metals in water (including mercury), VOC samples in water and sediment, DOC samples in water, and bacteria samples.
- Field blanks for other media and analytes should be conducted upon initiation of sampling, and if field blank performance is acceptable (as described in **Table B-11**), further collection and analysis of field blanks for these other media and analytes need only be performed on an as-needed basis, or during field performance audits. An as-needed basis for the SMB JG7 WMP

Group CIMP will be annually.

Field blanks will consist of laboratory-prepared blank water (certified to be contaminant-free by the laboratory) processed through the sampling equipment using the same procedures used for environmental samples.

If any analytes of interest are detected at levels greater than the MDL, the source(s) of contamination should be identified and eliminated, if possible. The sampling crew should be notified so that the source of contamination can be identified (if possible) and corrective measures taken prior to the next sampling event.

3.2.3 Field Duplicates

The purpose of analyzing field duplicates is to demonstrate the precision of sampling and analytical processes. Field duplicates will be prepared at the rate of 5% of all samples, and analyzed along with the associated environmental samples. Field duplicates will consist of two samples collected simultaneously, to the extent practicable. If the Relative Percent Difference (RPD) of field duplicate results is greater than the percentage stated in **Table B-11** and the absolute difference is greater than the RL, both samples should be reanalyzed, if possible. The sampling crew should be notified so that the source of sampling variability can be identified (if possible) and corrective measures taken prior to the next sampling event.

3.3 QA/QC Laboratory Analyses

Quality control samples prepared in the laboratory will consist of method blanks, laboratory duplicates, matrix spikes/duplicates, laboratory control samples (standard reference materials), and toxicity quality controls.

3.3.1 Method Blanks

The purpose of analyzing method blanks is to demonstrate that sample preparation and analytical procedures do not result in sample contamination. Method blanks will be prepared and analyzed by the contract laboratory at a rate of at least one for each analytical batch. Method blanks will consist of laboratory-prepared blank water processed along with the batch of environmental samples. If the result for a single method blank is greater than the MDL, or if the average blank concentration plus two standard deviations of three or more blanks is greater than the RL, the source(s) of contamination should be corrected, and the associated samples should be reanalyzed.

3.3.2 Laboratory Duplicates

The purpose of analyzing laboratory duplicates is to demonstrate the precision of the sample preparation and analytical methods. Laboratory duplicates will be analyzed at the rate of one pair per sample batch. Laboratory duplicates will consist of duplicate laboratory fortified method blanks. If the RPD for any analyte is greater than the percentage stated in **Table B-11** and the absolute difference between duplicates is greater than the RL, the analytical process is not being performed adequately for that analyte. In this case, the sample batch should be prepared again, and laboratory duplicates should be reanalyzed.

3.3.3 Matrix Spikes and Matrix Spike Duplicates

The purpose of analyzing matrix spikes and matrix spike duplicates is to demonstrate the performance of the sample preparation and analytical methods in a particular sample matrix. Matrix spikes and matrix spike duplicates will be analyzed at the rate of one pair per sample batch. Each matrix spike and matrix spike duplicate will consist of an aliquot of laboratory-fortified environmental sample. Spike concentrations should be added at five to ten times the reporting limit for the analyte of interest.

If the matrix spike recovery of any analyte is outside the acceptable range, the results for that analyte have failed to meet acceptance criteria. If recovery of laboratory control samples is acceptable, the analytical process is being performed adequately for that analyte, and the problem is attributable to the sample matrix. An attempt will be made to correct the problem (e.g., by mixing, concentration, etc.), and the samples and matrix spikes will be re-analyzed.

If the matrix spike duplicate RPD for any analyte is outside the acceptable range, the results for that analyte have failed to meet acceptance criteria. If the RPD for laboratory duplicates is acceptable, the analytical process is being performed adequately for that analyte, and the problem is attributable to the sample matrix. An attempt will be made to correct the problem (e.g., by mixing, concentration, etc.), and the samples and matrix spikes will be re-analyzed.

3.3.4 Laboratory Control Samples

The purpose of analyzing laboratory control samples (or a standard reference material) is to demonstrate the accuracy of the sample preparation and analytical methods. Laboratory control samples will be analyzed at the rate of one per sample batch. Laboratory control samples will consist of laboratory fortified method blanks or a standard reference material. If recovery of any analyte is outside the acceptable range, the analytical process is not being performed adequately for that analyte. In this case, the sample batch should be prepared again, and the laboratory control sample should be reanalyzed.

3.3.5 Surrogate Spikes

Surrogate recovery results are used to evaluate the accuracy of analytical measurements for organics analyses on a sample-specific basis. A surrogate is a compound (or compounds) added by the laboratory to method blanks, samples, matrix spikes, and matrix spike duplicates prior to sample preparation, as specified in the analytical methodology. Surrogates are generally brominated, fluorinated or isotopically labeled compounds that are not usually present in environmental media. Results are expressed as percent recovery of the surrogate spike. Surrogate spikes are applicable for analysis of PCBs and pesticides.

3.3.6 Toxicity Quality Control

For aquatic toxicity tests, the acceptability of test results is determined primarily by performance-based criteria for test organisms, culture and test conditions, and the results of control bioassays. Control bioassays include monthly reference toxicant testing. Test acceptability requirements are documented in the method documents for each bioassay method.

Section 4 Instrument/Equipment Calibration and Frequency

Frequencies and procedures for calibration of analytical equipment used by each contract laboratory are documented in the QA Manual for each laboratory. Any deficiencies in analytical equipment calibration should be managed in accordance with the QA Manual for each contract laboratory. Any deficiencies that affect analysis of samples submitted through this program must be reported to the SMB JG7 WMP Group. Laboratory QA Manuals are available for review at the analyzing laboratory.

Attachment C

Outfall Investigation Photographic Log

Site ID: SMBJ7-O-1 **GPS Coordinates:** 33.720405, -118.328695 **Description:** - Outfall diameter approximately 5 feet - Outfall appears to be corrugated metal pipe - Outfall not discharging at time of inspection - Cliff is moist, suggesting minor discharge - Relatively large area to allow for ponding in event of outfall discharge - Outfall not accessible – protruding from cliff - Approximately ¼ mile west of paved ground at White Point /Royal Palms County Beach parking lot (walked on rocks to access and take photos)	  

RB-AR16795

Land Use	HUC12		J7 WMP Area		SMBJ7-O-1	
	Acres	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	1.4	0.4
Education	806.2	3.3	32.2	3.4	2.6	0.7
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	60.0	15.8
SF Residential	11265.0	46.7	535.9	56.2	134.2	35.5
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	243.3	25.5	180.3	47.6
Total	24115.1	100	954.4	100	378.4	100

Site ID: SMBJ7-O-2 **GPS Coordinates:** 33.718976, -118.323855 Coordinates of bridge **Description:** - Could not observe the outfall from either below or above (private property above) - Photos are of rock-lined spillway that appears to be downstream of outfall - No discharge observed at time of investigation (dry) - Located just west of White Point/Royal Palms County Beach parking lot	  

RB-AR16797

	HUC12		J7 WMP Area		SMBJ7-O-2	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	0.0	0.0
Education	806.2	3.3	32.2	3.4	8.0	5.7
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	6.8	4.8
SF Residential	11265.0	46.7	535.9	56.2	99.6	70.7
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	243.3	25.5	26.5	18.8
Total	24115.1	100	954.4	100	140.8	100

Site ID:

SMBJ7-O-3

GPS Coordinates:

33.718484, -118.321043

Description:

- Outfall diameter approximately 3-4 feet
- Outfall appears to be corrugated metal pipe
- Outfall was discharging at time of investigation (approximately 5^+ gpm)
- Ponding was observed at the time of investigation – flow did not reach downstream culvert that brings flow to the beach
- Mouth of pond/earth channel is connected to a 2 foot diameter culvert that appears to be the designated location of SMB-7-06 (see photos on next page)
- Outfall not accessible
- Ponding location and downstream channel located on west site of White Point/Royal Palms County Beach parking lot

Site ID:	
SMBJ7-O-3 (continued)	 

	HUC12		J7 WMP Area		SMBJ7-O-3	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	13.9	7.9
Education	806.2	3.3	32.2	3.4	0.0	0.0
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	7.3	4.2
SF Residential	11265.0	46.7	535.9	56.2	131.3	74.5
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	243.3	25.5	23.8	13.5
Total	24115.1	100	954.4	100	176.4	100

Site ID:

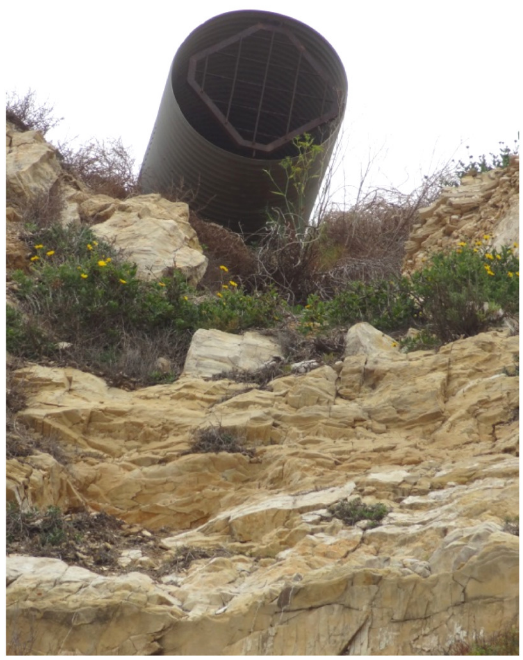
SMBJ7-O-3 Continued

GPS Coordinates:

33.7177861, -118.3211305

Description:

- Outfall diameter approximately 2 feet
- Outfall not discharging at time of investigation (dry)
- Outfall is downstream of SMBJ7-O-3, carries water from SMBJ7-O-3 pond/earth channel to the beach front
- Accessible with parking located nearby in White Point/Royal Palms County Beach parking lot

Site ID: SMBJ7-O-4 **GPS Coordinates:** 33.715769, -118.317973 **Description:** - Outfall diameter approximately 3-4 feet - Outfall not discharging at time of investigation (dry) - Outfall is hanging from cliff – not accessible - Located approximately 500 feet east of White Point/Royal Palms County Beach parking lot	 

Site ID:

SMBJ7-O-5

GPS Coordinates:

33.714331, -118.316115

Description:

- Outfall Diameter approximately 3 feet
- Two pipes (one plastic, one concrete channel) on top of each other
- Outfall(s) not discharging during the time of inspection
- To access site, had to pass a gate that said “Danger” located approximately ¼ mile east of White Point/Royal Palms County Beach parking lot

	HUC12		J7 WMP Area		SMBJ7-O-5	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	0.0	0.0
Education	806.2	3.3	32.2	3.4	5.9	2.6
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	22.1	9.8
SF Residential	11265.0	46.7	535.9	56.2	96.7	43.0
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	243.3	25.5	100.1	44.5
Total	24115.1	100	954.4	100	224.8	100

Site ID:

SMBJ7-O-6

GPS Coordinates:

33.711563, -118.303522

Description:

- Width of Outfall approximately 25’
- Height of Outfall approximately 18’
- Outfall discharge was a slow trickle during time of observation
- Water ponded at mouth of the outfall
- Trash and excessive vegetation at mouth of outfall
- Accessible from path that begins on Paseo Del Mar and Barbara Street – path would be safer with handrail installed

RB-AR16806

	HUC12		J7 WMP Area		SMBJ7-O-6	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	24.1	2.5	0.0	0.0
Education	806.2	3.3	32.2	3.4	2.8	1.7
Industrial	1487.5	6.2	0.5	0.1	0.0	0.0
MF Residential	2042.4	8.5	118.4	12.4	21.9	13.6
SF Residential	11265.0	46.7	535.9	56.2	125.7	77.9
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	243.3	25.5	11.0	6.8
Total	24115.1	100	954.4	100	161.4	100

Site ID: SMBJ7-O-7 **GPS Coordinates:** 33.709988, -118.298985 **Description:** - Outfall diameter approximately 1.5 feet - Outfall material corroded corrugated metal pipe (broken in multiple areas) - Outfall was not discharging at time of inspection - Pipe was filled with sediment – suggests minimal flow if any - Located in identified vicinity of SMB-7-08 - Accessible from a path that begins on Paseo Del Mar and Meyler Street	  

Site ID:

SMBJ7-O-8

GPS Coordinates:

33.709331, -118.296322

Description:

- Outfall diameter approximately 1.5 feet
- Outfall material is corrugated metal pipe
- Outfall not discharging at time of inspection
- Outfall represents only road runoff
- Not accessible for monitoring - hanging from cliff
- Across the street from Fort Mac Arthur Museum / Battery Osgood-Farley National Register Site

Attachment D

Example Calibration, Field and Chain of Custody Forms

Example Field Calibration Log Sheet

METER CALIBRATIONS/FIELD MEASUREMENTS STN NO___________________________

Calibrated by:______________________________ Location:___________________________

Date:_________________ Time:_____________

TEMPERATURE Meter MAKE/MODEL ___________________ S/N _______________ Thermister S/N _______________ Thermometer ID _______________

Lab Tested against NIST Thermometer/Thermister? N Y Date: ____________________ ±___________ °C

Measurement Location: SINGLE POINT AT _______ ft DEEP STREAMSIDE _______ FT FROM LEFT RIGHT BANK VERTICAL AVG/MEDIAN OF ________ POINTS

Field Readings #1 ________ #2 ________ #3 ________ #4 _________ #5 _________ **MEDIAN:**__________ °C Remark ___ ___ Qualifier ___ ___

pH Meter MAKE/MODEL ______________________ S/N _________________ Electrode No. ________________ Type: GEL LIQUID OTHER ____________

Sample: FILTERED UNFILTERED CONE SPLITTER CHURN SPLITTER SINGLE POINT AT _______ FT DEEP VERTICAL AVG. OF _____ POINTS

pH BUFFER	BUFFER TEMP	THEO-RETICAL pH FROM TABLE	pH BEFORE ADJ.	pH AFTER ADJ.	SLOPE	MILLI-VOLTS
pH 7						
pH 7						
pH 7						
pH ___						
pH ___						
pH ___						
CHECK pH ___						

TEMPERATURE CORRECTION FACTORS FOR BUFFERS APPLIED? Y N

BUFFER LOT NUMBERS :

pH 7: ____________________________

pH ____: ____________________________

CHECK pH ____: ____________________________

BUFFER EXPIRATION DATES:

pH 7: ____________________________

pH ____ : ____________________________

CHECK pH ____: ____________________________

Calibration Criteria: ± 0.2 pH units

Field Readings # 1_______ # 2______ # 3______ # 4______ # 5 ______ **MEDIAN:** ________ **Units** Remark ___ ___ Qualifier ___ ___

SPECIFIC CONDUCTANCE Meter MAKE/MODEL _______________________ S/N ___________________ Sensor Type: DIP FLOW-THRU OTHER____________

Sample: CONE SPLITTER CHURN SPLITTER SINGLE POINT AT _______ ft DEEP VERTICAL AVG. OF _______ POINTS

STD VALUE	STD TEMP	SC BEFORE ADJ.	SC AFTER ADJ.	STD LOT NO	STD EXPIR-ATION DATE	COMMENTS

AUTO TEMP COMPENSATED METER ___

MANUAL TEMP COMPENSATED METER ___

CORRECTION FACTOR APPLIED? Y N

CORRECTION FACTOR= ____________

Calibration Criteria: the greater of 5 μS/cm or 3% of measured value

Field readings # 1_______ # 2______ # 3______ # 4______ # 5 ______ **MEDIAN:** ________ **μS/cm** Remark ___ ___ Qualifier ___ ___

DISSOLVED OXYGEN Meter MAKE/MODEL ______________________________ S/N ____________________ Probe No. _______________________

Air Calibration Chamber in Water Air-Saturated Water Air Calibration Chamber in Air Winkler Titration Other___________________________

Sample: SINGLE POINT AT _______ ft DEEP VERTICAL AVG. OF _____ POINTS BOD BOTTLE OTHER_____________ Stirrer Used? Y N

WATER TEMP °C	BAROMETRIC PRESSURE mm Hg	DO TABLE READING mg/L	SALINITY CORR. FACTOR	DO BEFORE ADJ.	DO AFTER ADJ.

Calibration Criteria: ± 0.3 mg/L

Zero DO Check _________mg/L Adj. to _________ mg/L Date: _______________

Zero DO Solution Date__________ Thermister Check? Y N Date__________

Membrane Changed? N Y Date: _______________ Time: ____________

Barometer Calibrated? N Y Date: _______________ Time: ____________

Battery Check: REDLINE _______ RANGE _________________

Field readings # 1_______ # 2______ # 3______ # 4______ # 5 ______ **MEDIAN:** ________ **mg/L** Remark ___ ___ Qualifier ___ ___

OBSERVATIONS

Weather:____

Water Color:____________________ In Stream Activity:______________________

Water Characteristics (flow type, odor, turbidity, floatables):__________________________

Other comments (trash, wildlife, recreational uses, homeless activity, etc. – Use notes section if more room is needed):

____

GENERAL INFORMATION Date: ________________

Site ID: ______________________ Sampling Personnel:____________________

GPS Coordinates: (lat) ______________ (long) ________________ Picture/Video #: __________

***In situ* WATER QUALITY MEASUREMENTS**

Time	Temp (^{0}C)	pH	D.O. (mg/L)	Elec Cond. (uS/cm)	Turbidity (NTU)	Salinity (for ocean sampling only) (PSU)

COLLECTED WATER QUALITY SAMPLES

Sample ID	Analysis	Time	Volume	Notes
				Field blank
				Field duplicate

ADDITIONAL WATER QUALITY SAMPLING NOTES:

RB-AR16812

FLOW MEASUREMENTS WITH VELOCITY METER

Estimated Total Width of Flowing Water (ft): ____________ Distance measured from (circle): RIGHT or LEFT

Measurement Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Distance from Bank (ft)														
Depth (ft)														
Velocity (ft/s)														

FLOW MEASUREMENTS WITH FLOAT AND STOPWATCH Number of Flow Paths:______

Fill out Path # ➔	Path#	Path#	Path#	Path#	Path#
Width of Flow at **Top** of Marked Section:					
Width of Flow at **Middle** of Marked Section:					
Width of Flow at **Bottom** of Marked Section:					
Depth of Flow at 0% of **Top** Marked Section:					
Depth of Flow at 25% of **Top** Marked Section:					
Depth of Flow at 50% of **Top** Marked Section:					
Depth of Flow at 75% of **Top** Marked Section:					
Depth of Flow at 100% of **Top** Marked Section:					
Depth of Flow at 0% of **Middle** Marked Section:					
Depth of Flow at 25% of **Middle** Marked Section:					
Depth of Flow at 50% of **Middle** Marked Section:					
Depth of Flow at 75% of **Middle** Marked Section:					
Depth of Flow at 100% of **Middle** Marked Section:					
Depth of Flow at 0% of **Bottom** Marked Section					
Depth of Flow at 25% of **Bottom** Marked Section:					
Depth of Flow at 50% of **Bottom** Marked Section:					
Depth of Flow at 75% of **Bottom** Marked Section:					
Depth of Flow at 100% of **Bottom** Marked Section					
Distance Marked-off for Velocity:					
Time 1:					
Time 2:					
Time 3:					

Specify if measurements are in inches or feet using "in" or "ft"

CHAIN OF CUSTODY RECORD

Company:					Phone:			Job No.										Page _______ of _______
Project Manager:					Email:			Analysis Requested										Test Instruction & Comments
Project Name:					Project #													
Site Name: & Address:																		
Sample ID		**Lab ID**	**Date**	**Time**	**Matrix**	**Container Number/Size**	**Pres.**											
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

Sample Receipt: To Be Filled By Lab	**Turn Around Time**	Relinquished By: 1	Relinquished By: 2	Relinquished By: 3
Total Number of Containers	Normal	Signature	Signature	Signature
Custody Seals Yes No N/A	Rush	Printed Name		Printed Name
Received in Good Condition Yes No	Same Day	Date Time	Date Time	Date Time
Properly Cooled Yes No N/A	24 Hrs	Received By 1	Received By 2	Received By 3
Samples Intact Yes No N/A	48 Hrs	Signature	Signature	Signature
Samples Accepted Yes No	72 Hrs	Printed Name	Printed Name	Printed Name
		Date Time	Date Time	Date Time

October 27, 2014

Dr. Shahram Kharaghani
City of Los Angeles
Department of Public Works, Bureau of Sanitation
Watershed Protection Division
1149 South Broadway, 10th Floor
Los Angeles, CA 90015

Ms. Gail Farber, Chief Engineer
Los Angeles County Flood Control District
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

REVIEW OF THE DRAFT WATERSHED MANAGEMENT PROGRAM FOR THE CITY OF LOS ANGELES AREA IN SANTA MONICA BAY JURISDICTIONAL GROUP 7 SUBWATERSHED, PURSUANT TO PART VI.C OF THE LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT (NPDES PERMIT NO. CAS004001; ORDER NO. R4-2012-0175)

Dear Dr. Kharaghani and Ms. Farber:

The Regional Water Board has reviewed the draft Watershed Management Program (WMP) submitted on June 27, 2014 by the City of Los Angeles and Los Angeles County Flood Control District (LACFCD) for the City of Los Angeles' land area and the LACFCD's infrastructure within Jurisdictional Group 7 of the Santa Monica Bay Watershed Management Area. This program was submitted pursuant to the provisions of NPDES Permit No. CAS004001 (Order No. R4-2012-0175), which authorizes discharges from the municipal separate storm sewer system (MS4) operated by 86 municipal Permittees within Los Angeles County (hereafter, LA County MS4 Permit). The LA County MS4 Permit allows Permittees the option to develop either a Watershed Management Program (WMP) or Enhanced Watershed Management Program (EWMP) to implement permit requirements on a watershed scale through customized strategies, control measures, and best management practices (BMPs). Development of a WMP or EWMP is voluntary and may be developed individually or collaboratively.

The purpose of a WMP or EWMP is for a Permittee to develop and implement a comprehensive and customized program to control pollutants in MS4 discharges of storm water and non-storm water to address the highest water quality priorities. These include complying with the required water quality outcomes of Part V.A (Receiving Water Limitations) and Part VI.E and Attachments L through R (Total Maximum Daily Load (TMDL) Provisions) of the LA County MS4 Permit. If a Permittee opts to develop a WMP or EWMP, the WMP or EWMP must meet the requirements, including conducting a Reasonable Assurance Analysis (RAA), of Part VI.C (Watershed Management Programs) of the LA County MS4 Permit and must be approved by the Regional Water Board.

As stated above, on June 27, 2014, the City of Los Angeles (City) and the LACFCD submitted a draft Watershed Management Program (WMP) for the City's land area and the LACFCD's infrastructure within Jurisdictional Group 7 (JG7) of the Santa Monica Bay (SMB) Watershed Management Area (WMA) to the Regional Water Board pursuant to Part VI.C.4.c of the LA County MS4 Permit.

The Regional Water Board has reviewed the draft WMP and has determined that, for the most part, the draft WMP includes the elements and analysis required in Part VI.C of the LA County MS4 Permit for the City's land area and the LACFCD's infrastructure within JG7 of the SMB WMA. However, some revisions to the City's and LACFCD's draft WMP are necessary. The Regional Water Board's comments on the draft WMP, including detailed information concerning necessary revisions to the draft WMP are found in Enclosure 1. The specific Permit provisions cited in the enclosure refer to provisions in the LA County MS4 Permit. The LA County MS4 Permit includes a process through which revisions to the draft WMP can be made (Part VI.C.4 in the LA County MS4 Permit). The process requires that a final WMP, revised to address Regional Water Board comments, must be submitted to the Regional Water Board not later than three months after comments are received by the Permittees on the draft program. Please make the necessary revisions to the draft WMP as identified in the enclosure to this letter and submit the revised WMP as soon as possible and no later than **January 27, 2015.**

The revised WMP must be submitted to losangeles@waterboards.ca.gov with the subject line "LA County MS4 Permit – Revised SMB JG7 WMP" with a copy to Ivar.Ridgeway@waterboards.ca.gov and Rebecca.Christmann@waterboards.ca.gov.

If the necessary revisions are not made, the City and the LACFCD will be subject to the baseline requirements in Part VI.D of the Order and shall demonstrate compliance with receiving water limitations pursuant to Part V.A and with applicable interim and final water quality-based effluent limitations (WQBELs) in Part VI.E and Attachment M pursuant to subparts VI.E.2.d.i.(1)-(3) and VI.E.2.e.i.(1)-(3), respectively.

Until the draft SMB JG7 WMP is approved, the City and LACFCD are required to:

(a) Continue to implement all watershed control measures in its existing storm water management programs, including actions within each of the six categories of minimum control measures consistent with Title 40, Code of Federal Regulations, section 122.26(d)(2)(iv);
(b) Continue to implement watershed control measures to eliminate non-storm water discharges through the MS4 that are a source of pollutants to receiving waters consistent with Clean Water Act section 402(p)(3)(B)(ii); and
(c) Target implementation of watershed control measures in (a) and (b) above to address known contributions of pollutants from MS4 discharges to receiving waters.
(d) Implement watershed control measures, where possible from existing TMDL implementation plans, to ensure that MS4 discharges achieve compliance with interim and final trash WQBELs and all other final WQBELs and receiving water limitations pursuant to Part VI.E and set forth in Attachment M by the applicable compliance deadlines occurring prior to approval of the WMP.

In addition on June 27 2014, the City and the LACFCD submitted a draft Coordinated Integrated Monitoring Program (CIMP) for the SMB JG7 WMA to the Regional Water Board pursuant to Part IV.C of Attachment E of the LA County MS4 Permit. The Regional Water Board review and comments on the draft CIMP will be provided under separate cover.

If you have any questions, please contact Ms. Rebecca Christmann of the Storm Water Permitting Unit by electronic mail at Rebecca.Christmann@waterboards.ca.gov or by phone at (213) 576-5734. Alternatively, you may also contact Mr. Ivar Ridgeway, Chief of the Storm Water Permitting Unit, by electronic mail at Ivar.Ridgeway@waterboards.ca.gov or by phone at (213) 620-2150.

Sincerely,

for Chief Deputy E.O.

Samuel Unger, P.E.
Executive Officer

cc: Donna Chen, City of Los Angeles
Hubertus Cox, City of Los Angeles
Hamid Tadayon, City of Los Angeles
Angela George, Los Angeles County Flood Control District

Enclosure: Summary of Comments and Required Revisions

Attachment to October 27, 2014 Letter Regarding the Draft Watershed Management Program for the City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7 Subwatershed, Pursuant to Part VI.C of the LA County MS4 Permit (Order No. R4-2012-0175)

Summary of Comments and Required Revisions to the Draft Watershed Management Program

LA County MS4 Permit Provision	Summary of Comments and Necessary Revisions
Part VI.C.5.a.i Water Quality Characterization	The geographical scope of this WMP is the City of Los Angeles' land area and the LACFCD's infrastructure within Santa Monica Bay (SMB) Jurisdictional Group 7 (JG7) subwatershed. It appears that there are 4 shoreline monitoring locations (SMB 7-06 though SMB 7-09) adjacent to the City's area within SMB JG7, which includes Point Fermin Park Beach. Point Fermin Park Beach should be included in the bulleted list in Section 2.1. The WMP needs to include and evaluate the monitoring data from sampling location SMB 7-7 prior to the landslide in 2009, which is the only point zero sampling point, and the geometric mean data for all sampling locations. In addition, the WMP needs to analyze all available Bight data, in order to determine if there were exceedances of receiving water limitations besides PCBs and DDTs, Basin Plan objectives or the Screening Levels as listed in Attachment G of the LA MS4 Permit.
Parts VI.C.5.a.ii(1) and iv(1) Water Body-Pollutant Classification	For completeness, the WMP could address the 303(d) listing of *Fish Consumption Advisory* as a footnote to Table 2-8 associated with the pollutants, DDTs and PCBs.
Part VI.C.5.a.ii(2) and iv(2) Water Body-Pollutant Classification	The WMP needs to include a discussing of why sediment toxicity is not included as a Category 2 WBPC. The City and LACFCD could cite USEPA's recommendation that SMB not be identified as impaired by sediment toxicity in the next 303(d) List and provide data to support delisting. In addition, in Section 2.1.5, the WMP needs to discuss what data was evaluated and how the Permittees evaluated the available water quality data for water body-pollutant combinations that would fall into Category 2. It is assumed that the same Bight data that was evaluated for Category 3 pollutants could be used to evaluate whether there are exceedances of any pollutant that would meet the State's listing criteria.
Part VI.C.5.a.ii(3) and iv(2) Water Body-Pollutant	The draft WMP states, "The only TMDL sediment-based targets applicable to the SMB JG7 WMP area are for DDTs and PCBs;

LA County MS4 Permit Provision	Summary of Comments and Necessary Revisions
Classification	therefore, DDTs and PCBs are the only analytes included in this analysis." However, the purpose of the water quality characterization is to identify other potential pollutants of concern, not just those that are already being addressed. The sediment data from 2003 and 2008 should be further evaluated to identify if there are other sediment bound pollutants at concentrations of concern in the area offshore from the SMB JG7 WMP area.
Part VI.C.5.a.iii Source Assessment	The WMP needs to include a source assessment regarding known and suspected storm water and non-storm water pollutant sources in discharges to the MS4 and from the MS4 to receiving waters. The source assessment should include (1) a discussion of findings from implementation of the minimum control measures under the 2001 Permit; (2) a discussion of the data and conclusions from the TMDL source investigations; and (3) known or suspected sources of storm water and non-storm water pollutants, which may cause or contribute to the water quality exceedances which have been observed at the shoreline monitoring sites.
Part VI.C.5.a.iii.(1)(b) Source Assessment	The WMP needs to identify on a map the City's and LACFCD's catch basins and major outfalls. Regional Water Board staff is aware that the CIMP (Figure 3, Table 12 and Attachment C) identifies outfalls to SMB. However, the WMP should include this information as well.
Part VI.C.5.a.iv.(1) Prioritization	Section 4.1, page 28 of the draft WMP reports to be in compliance with the SMB bacteria TMDL. However, Table 2-6 clearly shows that the allowable exceedance days have been exceeded. The revised WMP needs to discuss the cause of these exceedances. The City and LACFCD will meet the interim and final WQBELs for trash by retrofitting all catch basins in the City's and LACFCD's area of Santa Monica Bay JG7 with full capture devices. The revised WMP needs to clarify if 218 or 220 catch basins will be retrofitted.
Part VI.C.5.b.ii.(1) Selection of Watershed Control Measures	The WMP needs to specify a strategy that will be implemented to prevent or eliminate non-storm water discharges, if necessary based on the findings of the non-storm water screening program.
Part VI.C.5.b.iv.(4)(b)-(e) Selection of Watershed Control Measures	The draft WMP states that all catch basins will be retrofitted by 2016, ahead of the 2020 compliance deadline; however, the WMP needs to provide a schedule that demonstrates that the required 20% load reduction in debris will be achieved by the interim compliance deadline of March 20, 2016. The revised WMP needs to provide more specificity with regards to the schedule, location and agencies responsible for retrofitting the catch basins with full capture devices throughout the JG7 WMP area.
Part VI.C.5.b.iv.(5) Reasonable Assurance Analysis	A reasonable assurance analysis was not performed. As stated in the draft WMP, "For the SMB JG7 WMP, there are currently zero required load reductions for the Category 1 WBPCs: bacteria at the Santa Monica Bay Beaches and PCBs/DDTs in the Santa Monica Bay. Compliance with the Trash TMDL is being demonstrated through

LA County MS4 Permit Provision	Summary of Comments and Necessary Revisions
	retrofitting of catch basins as outlined in the Trash Monitoring and Reporting Program. …Therefore, no quantitative RAA modeling is required for this WMP."
Part VI.C.5.b.iv.(6) Legal Authority	The City and the LACFCD need to provide documentation that they have the legal authority to implement the Watershed Control Measures identified in the WMP, which includes the MCMs.
Part VI.C.5.c Compliance Schedules	the draft WMP did not develop a compliance schedule for the USEPA promulgated SMB TMDLs for DDT and PCBs, as required by the LA County MS4 Permit. Since this TMDL does not have a State-adopted implementation plan and further since the WLAs are based on existing conditions, the compliance deadline is immediate. The JG7 group should ensure that monitoring data are collected to demonstrate compliance with the applicable WQBELs.

January 7, 2015

Dr. Shahram Kharaghani
City of Los Angeles
Department of Public Works, Bureau of Sanitation
Watershed Protection Division
1149 South Broadway, 10th Floor
Los Angeles, CA 90015

Ms. Gail Farber, Chief Engineer
Los Angeles County Flood Control District
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

REVIEW OF THE CITY OF LOS ANGELES AREA IN SANTA MONICA BAY JURISDICTIONAL GROUP 7 SUBWATERSHED COORDINATED INTEGRATED MONITORING PROGRAM, PURSUANT TO PART VI.B AND ATTACHMENT E, PART IV.B OF THE LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT (NPDES PERMIT NO. CAS004001; ORDER NO. R4-2012-0175)

Dear Dr. Kharaghani and Ms. Farber:

The Regional Water Board has reviewed the monitoring program submitted on June 27, 2014 by the City of Los Angeles (City) and Los Angeles County Flood Control District (LACFCD) for the City of Los Angeles' land area and the LACFCD's infrastructure within Jurisdictional Group 7 of the Santa Monica Bay Watershed Management Area. This monitoring program was submitted pursuant to the provisions of NPDES Permit No. CAS004001 (Order No. R4-2012-0175), which authorizes discharges from the municipal separate storm sewer system (MS4) operated by 86 municipal Permittees within Los Angeles County (hereafter, LA County MS4 Permit). The LA County MS4 Permit allows Permittees the option to develop and implement, in coordination with an approved Watershed Management Program per Part VI.C, a customized monitoring program that achieves the five Primary Objectives set forth in Part II.A of Attachment E and includes the elements set forth in Part II.E of Attachment E. Customized monitoring programs may be developed on an individual jurisdictional basis, referred to as an Integrated Monitoring Program (IMP), or on a watershed basis, referred to as a Coordinated Integrated Monitoring Program (CIMP). These programs must be approved by the Executive Officer of the Regional Water Board.

The Regional Water Board has reviewed the City's and LACFCD's monitoring program and has determined that the monitoring program submitted did not include sufficient detail regarding some of the elements set forth in Part II.E to achieve the Primary Objectives as set forth in Part II.A of Attachment E of the LA County MS4 Permit. In particular, dry weather receiving water monitoring and storm-borne sediment sampling for DDTs and PCBs was lacking. The Regional Water Board's comments on the City of Los Angeles area in SMB JG7 CIMP, including detailed information concerning necessary additions and revisions to the CIMP, are found in Enclosure 1 and Enclosure 2.

Please make the necessary additions and revisions to the CIMP, as identified in the enclosures to this letter, and submit the revised CIMP as soon as possible and no later than **April 7, 2015.** The revised CIMP must be submitted to losangeles@waterboards.ca.gov with the subject line "LA County MS4 Permit – Revised City of LA SMB JG7 Coordinated Integrated Monitoring Program" with a copy to Ivar.Ridgeway@waterboards.ca.gov and Rebecca.Christmann@waterboards.ca.gov.

Upon approval of the revised CIMP by the Executive Officer, the City and LACFCD must prepare to commence the monitoring program within 90 days. If the necessary revisions are not made, the City and LACFCD must comply with the Monitoring and Reporting Program and future revisions thereto, in Attachment E of the LA County MS4 Permit.

Until the City's and LACFCD's CIMP is approved by the Executive Officer, the monitoring requirements pursuant to Order No. 01-182 and Monitoring and Reporting Program CI 6948, and pursuant to approved TMDL monitoring plans shall remain in effect for the City and LACFCD.

If you have any questions, please contact Ms. Rebecca Christmann of the Storm Water Permitting Unit by electronic mail at Rebecca.Christmann@waterboards.ca.gov or by phone at (213) 576-5734. Alternatively, you may also contact Mr. Ivar Ridgeway, Chief of the Storm Water Permitting Unit, by electronic mail at Ivar.Ridgeway@waterboards.ca.gov or by phone at (213) 620-2150.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

cc: Donna Chen, City of Los Angeles
Hubertus Cox, City of Los Angeles
Hamid Tadayon, City of Los Angeles
Angela George, County of Los Angeles, Department of Public Works

Enclosures: Enclosure 1 – Summary of Comments and Required Revisions
Enclosure 2 – Comments on Aquatic Toxicity Testing

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

Enclosure 1 to January 7, 2015 Letter Regarding the City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7 Subwatershed Draft Coordinated Integrated Monitoring Program, Pursuant to Part VI.B and Attachment E, Part IV.B of the LA County MS4 Permit (Order No. R4-2012-0175)

Summary of Comments and Required Revisions to the Draft Integrated Monitoring Program

CIMP Reference	MRP Element/ Reference (Attachment E)	Summary of Comments and Necessary Revisions
General Comments		
Section 1.1, pp. 1 - 7	Part VI.C.5.a.i Water Quality Characterization	The geographical scope of this CIMP is the City of Los Angeles' land area and the LACFCD's infrastructure within Santa Monica Bay (SMB) Jurisdictional Group 7 (JG7) subwatershed. As documented in the Regional Water Board letter dated January 20, 2004, the subwatershed boundary of the Jurisdictional Group 7 was changed to include the Point Fermin subwatershed at the southern boundary of JG7. The revised CIMP needs to make this correction throughout the document, which includes adding Point Fermin Park Beach to the bulleted list of receiving waters on page 7. This correction also needs to be reflected in the revised WMP.
Section 2, Figure 4, and Table 5	Part VI.C.5.a.i Water Quality Characterization	Figure 4 and Table 5 need to be revised to include the shoreline monitoring location SMB 7-09.
Receiving Water Monitoring		
Section 2.1.1, pg. 13	Attachment E Part II.E.1, pg. E-4	SMB Beaches Bacteria TMDL monitoring needs to continue at monitoring sites SMB 7-06, SMB 7-08, **and SMB 7-09** in accordance with the approved Santa Monica Bay Beaches Bacteria TMDL Coordinated Shoreline Monitoring Plan (CSMP).
Section 2.1.1, pg. 13	Attachment E Part VI.B.2.c., pg. E-14	Monitoring site SMB 7-07, a point zero sampling location, was destroyed in a landslide in 2009. A new point zero sampling site needs to be established to replace SMB 7-07. The new SMB Beaches Bacteria TMDL compliance location will be subject to the reference system criterion for allowable exceedance days until sufficient data are collected to evaluate whether the site should alternatively be subject to the antidegradation criterion. The new shoreline monitoring location shall be sampled for three bacterial indicators (total coliform, fecal coliform (or *E. coli*) and enterococcus) five (5) times per week pursuant to Part VI.B.2.c of Attachment E. After one (1) year of

CIMP Reference	MRP Element/ Reference (Attachment E)	Summary of Comments and Necessary Revisions
		sampling the Permittee may request a reduction of the sampling frequency based on the exceedance rate.
Section 2.1.3, pp. 14 - 15	Attachment E Part II.E.1, pg. E-4	The CIMP states that compliance with the WLAs for DDTs and PCBs will be assessed through monitoring conducted as part of the JG2/JG3 CIMP in Santa Monica Canyon Channel rather than sampling in the JG7 WMP Group area. The TMDL provides input on stormwater monitoring and states, "Monitoring should be conducted on a coordinated watershed-wide basis. The monitoring design and assessment framework should be designed to provide credible estimates of the total mass loadings to the Bay. Any such estimates will require some extrapolation from a few locations to the entire watershed. Stormwater permittees should document the methodology for any such extrapolation." (USEPA Region IX, 2012, Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs, page 56). If the City and LACFCD intend to rely on sampling in Santa Monica Canyon Channel, the methodology and justification for applying the sampling results from Santa Monica Canyon Channel to the City of LA area in Jurisdictional Group 7 needs to be presented in the CIMP. Based on an initial evaluation, it seems that there may be more representative sampling locations from which to extrapolate pollutant loads for the City of LA area within Jurisdictional Group 7. Santa Monica Canyon is over ten times larger, has a different land use distribution, and is located in a very different geographic area than the City of LA area within Jurisdictional Group 7. For example, it may be more appropriate to look at other stormwater data collected from storm drains on the Palos Verdes Peninsula.
Section 2.3, Table 9, and Section 2.3.1, pg. 18	Attachment E Part VI.C.1.a page E-15	The bacterial indicators total coliform, *E. coli* (fecal coliform) and enterococcus need to be sampled three times per year during wet weather at the receiving water station as required per Part VI.C.1.a of Attachment E.
Section 2.3, Table 9, and Section 2.3.1, pg. 18	Attachment E Part VI.C.1.d.iii pp. E-15 & E-16	The CIMP does not appear to include wet weather receiving water monitoring for DDTs and PCBs, which may be transported through the MS4 to Santa Monica Bay during storm events. The SMB TMDL for DDTs and PCBs recommends that MS4 Permittees filter water samples from mass emission stations (i.e., receiving water stations) and analyze the sediment for DDTs and PCBs. The revised CIMP needs to indicated through what program(s) monitoring of the receiving water for PCBs and DDT will be conducted consistent with the EPA established TMDL, or propose such monitoring as part of the CIMP.
Section 2.3,	Attachment E	In the third sentence of footnote 2 of Table 9, replace the reference to

CIMP Reference	MRP Element/ Reference (Attachment E)	Summary of Comments and Necessary Revisions
Table 9, footnote 2 and Section 2.3.1, pg. 18	Part VI.C.1.e page E-16	the MRP, with the language from the MRP as follows, "For pollutants detected above the lowest applicable water quality objective, ~~future monitoring will be conducted at the frequency specified in the MRP~~ then these pollutants will be analyzed for the duration of the LA MS4 Permit during wet weather at the receiving water monitoring station where it was detected. In addition, make the conforming change to the language in Section 2.3.1.
Section 2.3, Table 9, and Section 2.3.2, pp. 18-19	Attachment E Part VI.D.1.a page E-16	The CIMP did not propose dry weather receiving water monitoring unless it is triggered by the non-storm water outfall screening program. The objectives of the dry weather receiving water monitoring program include more than just determining whether a non-storm water discharge is causing or contributing to an exceedance of the receiving water quality. The objectives of the receiving water monitoring program also include: • Determining whether the receiving water limitations are being achieved; • Assessing trends in pollutant concentrations over time, or during specified conditions; and • Determining whether the designated beneficial uses are fully supported as determined by water chemistry, as well as aquatic toxicity and bioassessment monitoring. The revised CIMP needs to comply with all the dry weather receiving water monitoring requirements as contained in Attachment E, Part VI.D of the LA County MS4 Permit, or indicate how these objectives are being met for the receiving water adjacent to the City of LA area within Jurisdictional Group 7 by another program(s).
MS4 Infrastructure Information		
Section 3, pg. 20	Attachment E Part VII.A pp. E-20 & E-21	The revised CIMP needs to include the sources of the Geographic Information System (GIS) data used to generate the maps and database. In addition, submit the GIS database per the requirements in Attachment E, Part VII.A of the LA County MS4 Permit.
Storm Water Outfall Based Monitoring		
Section 4.3, and Table 11, pp. 22-23	Attachment E Part VIII.B.1.c pp. E-22 & E-23	The CIMP does not include stormwater outfall monitoring of DDTs and PCBs, which are pollutants addressed by a TMDL. Per Attachment E, Part VIII.B.1.c.ii, these pollutants must be monitored in stormwater discharges. As stated above, the CIMP states that compliance with the WLAs for DDTs and PCBs will be assessed through monitoring conducted as part of the JG2/JG3 CIMP in Santa Monica Canyon Channel rather than sampling in the JG7 WMP Group area.

CIMP Reference	MRP Element/ Reference (Attachment E)	Summary of Comments and Necessary Revisions
		The TMDL provides input on stormwater monitoring and states, "As both DDT and PCBs are highly associated with particles, monitoring should focus on sediment particles which may be transported during storms (e.g., as in Curren et al., 2011). We recommend that stormwater permittees filter water from their mass emission stations and analyze particles for DDT and PCBs. This will provide more meaningful estimates of mass loading than traditional water column sampling. We also recommend using sufficiently sensitive methods for DDT and PCBs (e.g. EPA method 1668c for PCB congeners). Monitoring should be conducted on a coordinated watershed-wide basis. The monitoring design and assessment framework should be designed to provide credible estimates of the total mass loadings to the Bay. Any such estimates will require some extrapolation from a few locations to the entire watershed. Stormwater permittees should document the methodology for any such extrapolation." (USEPA, Region IX, 2012, Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs, page 56). If the City and LACFCD intend to rely on sampling in Santa Monica Canyon Channel, the methodology and justification for applying the stormwater sampling results from Santa Monica Canyon Channel to the City of LA area in Jurisdictional Group 7 needs to be presented in the CIMP. Based on an initial evaluation, it seems that there may be more representative sampling locations from which to extrapolate pollutant loads for the City of LA area within Jurisdictional Group 7. Santa Monica Canyon is over ten times larger, has a different land use distribution, and is located in a very different geographic are than the City of LA area within Jurisdictional Group 7. For example, it may be more appropriate to look at other stormwater data collected from storm drains on the Palos Verdes Peninsula.
Section 4.3, and Table 11, pp. 22-23	Attachment E Part VIII.B.1.d page E-23	The CIMP proposes not to analyze the parameters listed in Attachment E, Table E-2 of the LA County MS4 Permit until after the first year of receiving water monitoring data has been reviewed. Wet weather receiving water monitoring of the parameters listed in Table E-2 is required to be conducted during the first significant rain event of the first year of monitoring. Therefore, the City does not need to delay the storm water outfall monitoring of the parameters in Table E-2 until the second year of monitoring. The revised CIMP shall include storm water outfall monitoring of subsequent storm events of the parameters in Table E-2, which exceed the lowest applicable water quality objectives at the receiving water monitoring station sampled after the first significant rain event.
Section 4.3,	Attachment E	The revised CIMP needs to discuss the duration over which the storm

CIMP Reference	MRP Element/ Reference (Attachment E)	Summary of Comments and Necessary Revisions
pg. 22	Part VIII.C page E-23	water outfall samples will be collected. In addition, the CIMP needs to specify if the storm water outfall samples will be taken by a continuous sampler. If not then the storm water samples need to be composited as outlined in Attachment E, Part VIII.C.2 of the LA County MS4 Permit.
Non-Stormwater Outfall Based Monitoring		
Section 5.3 pg. 26	Attachment E Part IX.B.1 page E-24	The CIMP proposes to perform three non-storm water outfall screenings during the first year after CIMP approval; however, the CIMP did not provide a schedule. The revised CIMP needs to provide a schedule of non-storm water screenings, which needs to address potential seasonal variations of non-storm water discharges.
Section 5.3 pg. 26	Attachment E Part IX.B.2 page E-24	The revised CIMP must include a process for reassessing the non-storm water outfall screening and monitoring plan within the current permit term pursuant to Attachment E, Part IX.B.2.
Section 5.3 pg. 26	Attachment E Part IX.C pp. E-24 & E-25	The revised CIMP needs to more specifically define thresholds for flow and *E. coli* density that will be used to conclude that an outfall has a significant non-storm water discharge.
Section 5.3 pg. 26	Attachment E Part IX.D pp. E-25 – E-26	The revised CIMP needs to include a process for updating annually, a MS4 inventory database and map of outfalls that have been identified as having significant non-storm water discharges or require no further assessment.
Section 5.4 pg. 27	Attachment E Part IX.E page E-26	The revised CIMP needs to provide a process for prioritizing outfalls with significant non-storm water discharges and a schedule to conduct the source identification of outfalls with significant discharges. If the City and LACFCD intend to follow the process set forth in Part IX.E of Attachment E, the CIMP may simply reference this section of the LA County MS4 Permit MRP and indicate that it will be followed.
Section 5.5.1 and Table 14, pp. 28-29	Attachment E Part IX.G pp. E-27 & E-28	The revised CIMP needs to comply with the non-storm water monitoring requirements as contained in Attachment E, Part IX.G.3 of the LA County MS4 Permit, which includes either monitoring of significant non-storm water discharges four times per year for the first year of monitoring or at the frequency specified in an approved TMDL monitoring plan unless sufficient justification is provided for an alternate frequency.
Section 5.5.1 , pp. 28-29	Attachment E Part IX.H.2 page E-28	The revised CIMP needs to discuss the duration over which the non-storm water outfall samples will be collected. In addition, the CIMP needs to specify if the non-storm water outfall samples will be taken by a continuous sampler. If not then the non-storm water samples need to be composited as outlined in Attachment E, Part IX.H.2of the LA County MS4 Permit unless sufficient justification for an alternate protocol is provided.
Section 5.6, pg. 29	Attachment E, Part IX.G.4 Pg. E-28	The CIMP states, "[I]f monitoring demonstrates that discharges do not exceed any WQBELs, then action levels or water quality standards for pollutants identified on the 303(d) list, monitoring will cease at the

CIMP Reference	MRP Element/ Reference (Attachment E)	Summary of Comments and Necessary Revisions
		outfall(s) after the first year.” Attachment E, Part IX.G.5 of the LA County MS4 Permit provides that, “Following one year of monitoring, the Permittee may submit a written request to the Executive Officer of the Regional Water Board to reduce or eliminate monitoring of specified pollutants, based on an evaluation of the monitoring data.” The CIMP must follow this process of submitting a written request prior to discontinuing monitoring at the outfalls after the first year.
Attachment B, Table B-2, pg. B-8	SMB TMDLs for DDTs and PCBs	The TMDL provides input on stormwater monitoring and states, “As both DDT and PCBs are highly associated with particles, monitoring should focus on sediment particles which may be transported during storms (e.g., as in Curren et al., 2011). We recommend that stormwater permittees filter water from their mass emission stations and analyze particles for DDT and PCBs. This will provide more meaningful estimates of mass loading than traditional water column sampling. We also recommend using sufficiently sensitive methods for DDT and PCBs (e.g. EPA method 1668c for PCB congeners). (USEPA, Region IX, 2012, Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs, page 56). Monitoring for PCBs in sediment or water should be reported as the summation of a minimum of 40 (and preferably at least 50) congeners and Aroclors as specified in Table E-2 of the Attachment E of the Permit. See Table C8 in the state’s Surface Water Ambient Monitoring Program’s Quality Assurance Program Plan (Page 72 of Appendix C), which can be downloaded at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/qaprp082209.pdf for guidance. It is preferable samples be analyzed using EPA Methods 8270 or 1668C (as appropriate), and High Resolution Mass Spectrometry.
Attachment C		Please provide a table with the land use information for outfalls SMBJ7-O-4, SMBJ7-O-7, and SMBJ7-O-8.

Curren J., S. Bush, S. Ha, M.K. Stenstrom, S. Lau, I.H. Suffet. 2011. Identification of subwatershed sources for chlorinated pesticides and polychlorinated biphenyls in the Ballona Creek watershed. Science of the Total Environment 409: 2525–2533

ENCLOSURE 2
COMMENTS ON AQUATIC TOXICITY TESTING
SANTA MONICA BAY JURISDICTIONAL GROUP 7 CIMP

Part XII.G.1. (Page E-30) and Part XII.G.2. (Page E-30) of the Monitoring and Reporting Program state that Permittees shall conduct aquatic toxicity monitoring utilizing the critical life stage chronic toxicity test methods listed. The draft CIMP does not propose use of critical life stage chronic toxicity test methods for assessment of toxicity in wet weather samples and instead proposes use of acute toxicity test methods. This is not acceptable; the appropriate chronic toxicity test method listed in the MRP must be used and both survival and sublethal endpoints must be reported. We suggest the group consult the State Water Resources Control Board 2011 publication, "Implementation Guidance: Toxicity Testing for Stormwater" to gain insight on how to run chronic toxicity tests on wet weather samples.

Part XII.I.1. (Page E-33) of the Monitoring and Reporting Program states that a toxicity test sample is immediately subject to TIE procedures if either survival or sublethal endpoints demonstrate a Percent Effect value equal to or greater than 50% at the Instream Waste Concentration. The draft CIMP does not propose to perform a TIE when at least a 50% sublethal effect is seen but instead proposes to first collect a confirmatory sample two weeks later.

This is not an acceptable approach. The CIMP seems to be implying that chronic toxicity has some inherent non-persistent quality to it that makes the results unreliable. It also implies that chronic toxicity is of lesser importance. Although it would be hard to generalize to all possible situations, the fact that a large number of invertebrates (or fish) living in a receiving water can survive an ambient pollutant concentration but are impacted in terms of growth or reproduction means that the population as a whole will be impacted, and could eventually collapse. Some species living in the receiving water have very short lifespans and during critical times of the year may be prey for other organisms that will in turn be impacted by their population decline.

Additionally, the toxicity flowcharts do not show the need to proceed to outfall toxicity testing should a TIE of a toxic receiving water sample be inconclusive and instead focus on the response to non-persistent toxicity. We strongly recommend a more cohesive approach whereby the City and LACFCD develop a Toxicity Assessment Plan analogous to the Discharge Assessment Plan currently proposed in the CIMP.

<u>Suggested Special Study</u>: The 2013 study released by the California Stormwater Quality Association (CASQA) entitled "Review of Pyrethroid, Fipronil and Toxicity Monitoring Data from California Urban Watersheds" reviewed stormwater data from studies conducted during 2005 - 2012 and highlighted the toxicity impacts from use of pesticides not currently required to be monitored for by the MRP. We suggest the group begin monitoring for these chemicals in the receiving water and, in addition, assess toxicity using the 2002 acute toxicity testing protocol (EPA-821-R-02-012) with the amphipod *Hyalella azteca* as the test organism. *H. azteca* is known to be much more sensitive to pyrethroids than is *Ceriodaphnia dubia*, while the latter is useful for its sensitivity to OP pesticides. The two species together may also prove to be more useful in detecting toxicity from fipronil. And, should 50% or greater effect be detected in the toxicity test, we suggest a procedure to incorporate pyrethroids into the subsequent TIE be documented (three possible treatments have been identified by researchers, see http://www.pubfacts.com/detail/20018342/Focused-toxicity-identification-evaluations-to-rapidly-identify-the-cause-of-toxicity-in-environment). While fipronil does not have a TIE procedure identified currently, chemical testing for the parameter (and degradates) and comparison to U.S. EPA Office of Pesticide Program's aquatic life benchmarks at http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm will aid in determining the cause(s) of toxicity in order to follow up with outfall testing of the parameter(s) with the ultimate goal of removing the source. This approach will also help minimize inconclusive TIE results which would lead to required toxicity testing in a representative upstream outfall.

Watershed Management Program for Santa Monica Bay Jurisdictional Group 7 within the City of Los Angeles

January 27, 2015

Project Number 10503614

Prepared for:
City of Los Angeles
Los Angeles County Flood Control District

Prepared by:
The MWH Team

MWH® Geosyntec consultants CWE M2 Resource Consulting, Inc.

Executive Summary

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) and the Los Angeles County Flood Control District (LACFCD), collectively referred to as the SMB JG7 WMP Group, pursue a WMP to fulfill the requirements of the MS4 Permit. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural best management practice (BMP) implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). In December of 2013, the SMB JG7 WMP Group submitted a revised notice of intent to develop a WMP for the City of Los Angeles land area within JG7 of the Santa Monica Bay Watershed. This WMP, in combination with the SMB JG7 Coordinated Integrated Monitoring Program (CIMP), was prepared to satisfy Part C.1.f of the Permit, which includes the following tasks:

1. Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters within each Watershed Management Area (WMA);
2. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d;
3. Execute an integrated monitoring program and assessment program pursuant to Attachment E – MRP, Part VI to determine progress towards achieving applicable limitations and/or action levels in Attachment G;
4. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the monitoring and reporting program (MRP) to ensure that applicable WQBELs, RWLs, and other milestones set forth in the WMP are achieved in the required timeframes; and
5. 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 WMPs and EWMPs from month 6 through the date of program approval.

WATERSHED CHARACTERIZATION

The SMB JG7 WMP Group area is located within the southern portion of the 414-square mile Santa Monica Bay Watershed, including the Santa Monica Bay and land area that drains into the Bay. The boundary of the Santa Monica Bay, as defined for the National Estuary Program, extends from the Los Angeles/Ventura County line to the northwest, and southeast to Point Fermin on the Palos Verdes Peninsula. The land area that drains into the Bay follows the crest of the Santa Monica Mountains on the north to Griffith Park, extends south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek, the natural drainage is a narrow coastal strip between Playa del Rey and Palos Verdes (Regional Board, 2011).

The JG7 area includes the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, Rolling Hills Estate, and the City of Los Angeles. This WMP only addresses the 1,056-acre area owned by the City within JG7, which includes the following water bodies as identified in the Basin Plan:

- Santa Monica Bay – Nearshore Zone
- Royal Palms Beach
- White's Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

IDENTIFICATION OF WATER QUALITY PRIORITIES

The water quality prioritization process of the Permit determines the Water Body-Pollutant Combinations (WBPCs) that will be addressed within the WMP area. Section IV.C.5(a)ii of the permit defines several categories of WBPCs to be used to prioritize WBPCs in order to guide the implementation of structural and institutional BMPs: **Category 1** (highest priority) are those subject to an established Total Maximum Daily Load (TMDL); **Category 2** (high priority) are those on the State Water Resources Control Board (SWRCB) 2010 Clean Water Act (CWA) Section 303(d) list or those constituents that have sufficient exceedances to be listed; and **Category 3** (medium priority) are those with observed exceedances, but at a rate too infrequent to be listed.

A detailed monitoring data analysis was conducted to:

1. Evaluate the status of TMDL compliance;
2. Evaluate the status of 303(d) listings (i.e., whether any WBPCs meet the SWRCB's 303[d] delisting criteria);
3. Identify other WBPCs that meet 303(d) listing criteria; and
4. Identify remaining WBPCs demonstrating exceedance(s) of applicable receiving water limitations through the use of Monitoring and Bight data.

The outcome of the preliminary water quality prioritization is summarized in **Table ES-1**. WBPCs are listed in order of compliance deadline with interim and final deadlines included. There were no Category 2 or 3 WBPCs identified within the SMB JG7 WMP Group area.

Table ES-1
Water Body-Pollutant Prioritization

(Listed in order of compliance deadline, interim and final are included.
Passed deadlines are shown in bold font)

Category	Water Body	Pollutant	Compliance Deadline
1	SMB Beaches	Summer dry weather bacteria	**7/15/2006 for single sample AEDs**
		Winter dry weather bacteria	**7/15/2009 for single sample AEDs**
		Wet weather	**7/15/2013 for single sample AEDs**[1]
			7/15/2013 for geometric mean (GM)[1]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][2,3]
		PCBs	[No compliance deadline specified in TMDL][2,3]
2	No Category 2 WBPCs have been identified at this time		
3	No Category 3 WBPCs have been identified at this time		

[1] Per Resolution 2006-008, the JG7 agencies elected to pursue a non-integrated water resources approach to SMBBB TMDL compliance, which resulted in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

[2] Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, the WLA target was set at the existing waste load, so antidegradation conditions exist.

[3] Contamination of DDT and PCBs in the sediments of the Santa Monica Bay has led to a 303(d) listing of Fish Consumption Advisory. The Santa Monica Bay TMDL for DDTs and PCBs issued in 2012 addresses the impairment to human health consumption due to DDT and PCBs in the Santa Monica Bay from Point Dume to Point Vicente and the Palos Verde Shelf from Point Vicente to Point Fermin.

REASONABLE ASSURANCE ANALYSIS

The Category 1 WBPCs identified for the JG7 SMB WMP include bacteria at the Santa Monica Bay Beaches, debris in the Santa Monica Bay Offshore/Nearshore, and polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethanes (DDTs) in the Santa Monica Bay. The three existing bacteria TMDL compliance monitoring locations (SMB 7-6, SMB 7-8, and SMB 7-9) are all open beach and antidegradation locations. SMB 7-7 has not been accessible or monitored since 2011 due to a landslide. Because the monitored locations are open beach monitoring locations, they have no definable drainage areas. As antidegradation sites, all three locations have an implied zero load reduction as compared to the reference beach. Therefore, compliance is demonstrated through a non-quantitative Reasonable Assurance Analysis (RAA). Similarly, for PCBs and DDTs the U.S. Environmental Protection Agency (USEPA) TMDL indicates that the current load for Santa Monica Bay is less than the required load; therefore, a zero load reduction is required for those parameters, demonstrating compliance though a non-quantitative RAA. Consistent with Section VI.E.5.b.i of the MS4 Permit, compliance with the Debris TMDL will be met through a phased retrofit of the City's catch basins in the SMB JG7 WMP area. The City has committed to retrofit the number of catch basins at a faster rate than required per the Regional Board implementation goals, with the goal of 100% of catch basins in the JG7 WMP area being retrofitted by July 2016. The City's Trash Monitoring and Reporting Plan (TMRP) (2012) states, *"vertical insert[s]* *with 5-mm openings and flow activated opening screen covers are the best suited for implementation within the City to achieve compliance with Trash TMDLs."* There are no industrial facilities within the SMB JG7 WMP area that use, store, transport, manufacture, or handle plastic pellets. Therefore, the City's Plastic Pellet Monitoring and Reporting Plan (PMRP) only includes an emergency response plan.

As part of the adaptive management process, and as additional monitoring data is collected as part of the approved CIMP, if a quantitative RAA utilizing BMP performance data becomes necessary, then an appropriate RAA approach would be determined at that time.

WATERSHED CONTROL MEASURES

Development of the WMP requires identification of structural or institutional BMPs expected to be sufficient to meet receiving water and effluent limitations set forth in the Permit. BMPs vary in function and type, with each BMP providing unique design characteristics and benefits from implementation. The overarching goal of BMPs in the WMP is to reduce the impact of stormwater and non-stormwater on receiving water quality.

There are currently 218 catch basins within the City of Los Angeles JG7 WMP area, with 57 planned to be retrofitted by December 2015. The remaining 161 catch basins will be retrofitted by July 2016. With the exception of these planned catch basin retrofits, which are considered to be distributed BMPs, there are no other regional or distributed structural BMPs existing or planned at this time. Through the adaptive management process, regional and/or distributed BMPs may be proposed if CIMP monitoring demonstrates that pollutant loads exceed the WQBELs or RWLs previously discussed. At this time, a quantitative RAA is not being presented due to zero load reduction requirements and alternative compliance measures.

The Permit (Parts VI.D.4 through VI.D.10) requires the implementation of new Minimum Control Measures (MCMs), while also requiring that currently implemented MCMs continue until the City of Los Angeles portion of SMB JG7 WMP is approved by the Regional Board. The existing MCMs, much like those proposed in the Permit, are comprised of six categories including:

- Public information and participation program;
- Industrial/commercial facilities program;
- Development planning program;
- Development construction program;
- Public agencies activities program; and
- Illicit connections and illicit discharges elimination program.

The Permit allows for the customization of these MCMs if proposed customizations perform at or beyond the level of effectiveness of the original requirements. At this time, the SMB JG7 WMP Group is not considering customizing MCMs.

It should be noted, however, that institutional BMPs such as street and median sweeping, storm drain inlet and conveyance system cleaning, pet waste program enhancements, etc. are assumed to result in a cumulative pollutant load reduction of up to or approximately 5%. Additionally, assuming past data also reflect future trends, it is anticipated that 0.1 – 0.3% of residential, commercial, and industrial parcels will implement low impact development (LID) annually through development or redevelopment projects[1].

[1] 0.1-0.3% annual estimate is based on the area-weighted projected development/redevelopment rate for residential, commercial, and industrial land uses reported by the City of Los Angeles in the Ballona Creek TMDL Implementation Plan.

Although RWLs are currently being met, it is anticipated that implementation of LID will further enhance the water quality in this region.

ADAPTIVE MANAGEMENT PROCESS

The WMP will be implemented as an adaptive program. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time. The steps involved in the adaptive management process are as follows:

1. Re-characterization of water quality priorities;
2. Source assessment re-evaluation;
3. Effectiveness assessment of watershed control measures; and
4. Updated Reasonable Assurance Analysis (RAA).

The adaptive management process provides a framework for the WMP to be a dynamic tool that remains relevant going forward. This process is repeated every two years following the final approval of the WMP.

SCHEDULE

The Notice of Intent submitted to the Regional Board in December 2013 provided a schedule of interim milestones for the development of the WMP and CIMP. At this time, the SMB JG7 WMP Group does not anticipate any deviations from the schedule. Completed milestones and projected completion dates for future milestones are presented in **Table ES-2.**

The compliance deadlines in the Santa Monica Bay Beaches Bacteria TMDL are currently in effect for SMB 7-6, SMB 7-8, and SMB 7-9. The TMDL for PCBs and DDTs does not include a compliance schedule for the WLAs for the SMB WMA, but because the WLAs were set based on the existing loads, the SMB WMA is considered to be in compliance. Therefore, a compliance schedule for the PCBs and DDTs TMDL is not being proposed at this time. The catch basin retrofit schedule for compliance with the Debris TMDL has been included in **Table ES-2**.

Table ES-2
WMP Schedule of Interim and Final Milestones

Deliverable	Planned Date of Completion
Submit Revised Final Draft WMP to the Regional Board	January 2015
Submit Final Draft CIMP to the Regional Board	June 2014
Submit Revised Final CIMP to the Regional Board	April 2015
57 catch basin opening cover and/or insert retrofits (cumulative) (26% of load reduced)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (100% of load reduced)	July 2016

Table of Contents

Section Name **Page Number**

Executive Summary i
1 Introduction 1
1.1 Background and Regulatory Framework 1
1.2 SMB JG7 WMP Group Geographical Area 2
1.3 Watershed Management Program Development Process 5
1.4 Watershed Management Program Overview 5
2 Identification of Water Quality Priorities 6
2.1 Water Quality Characterization 6
2.1.1 Water Quality Objectives/Criteria 7
2.1.2 QA/QC Criteria 10
2.1.3 Detailed Data Analysis 10
2.1.4 TMDL Compliance Status 10
2.1.5 Other Water Body-Pollutant Combinations that meet 303(d) Listing Criteria 14
2.1.6 Remaining Water Body-Pollutant Combinations Demonstrating Exceedance(s) of Applicable Receiving Water Limitations 14
2.2 Water Body-Pollutant Prioritization 14
2.2.1 Category 1 – Highest Priority 15
2.2.2 Category 2 – High Priority 16
2.2.3 Category 3 – Medium Priority 17
2.3 Source Assessment 17
2.3.1 Indicator Bacteria 17
2.3.2 DDT and PCBs 19
3 Watershed Control Measures 20
3.1 Minimum Control Measures/Institutional BMPs 20
3.1.1 Customization of MCMs 24
3.1.2 MCMs and Outcome Levels 25
3.1.3 Next Steps to MCM Customization 27
4 Reasonable Assurance Analysis 29
4.1 Bacteria 29
4.2 PCBs and DDTs 29
4.3 Debris, and Plastic Pellets 30

RB-AR16837

5 Adaptive Management Process **31**
5.1 Compliance Schedule 31
5.2 Re-Characterization of Water Quality Priorities 32
5.3 Source Assessment Re-evaluation 32
5.4 Effectiveness Assessment of Watershed Control Measures 33
5.5 Update of Reasonable Assurance Analysis 33
6 References **35**

Attachment A: Santa Monica Bay Shoreline Monitoring Data within SMB JG7 WMP Group Area

Attachment B: Documentation of Authority

List of Acronyms

Acronym	Definition
AED	Allowable Exceedance Day
ASBS	Areas of Special Biological Significance
Basin Plan	Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
BIOL	Preservation of Biological Habitats of Special Significance Beneficial Use Designation
BMP	Best Management Practice
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIMP	Coordinated Integrated Monitoring Program
City	City of Los Angeles
COMM	Commercial and Sport Fishing Beneficial Use Designation
CSMP	Coordinated Shoreline Monitoring Plan
CWA	Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
ED	Exceedance Day
EMC	Event Mean Concentration
ES	Executive Summary
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment Control Plan
EWMP	Enhanced Watershed Management Program
FC	Fecal Coliform
FIB	Fecal Indicator Bacteria
g/yr	Grams per Year

List of Acronyms

Acronym	Definition
GM	Geometric Mean
IC/ID	Illicit Connections and Illicit Discharges
IND	Industrial Service Supply Beneficial Use Designation
JG	Jurisdictional Group
JG7	Jurisdictional Group 7 of the City of Los Angeles
L-SWPPP	Local Storm Water Pollution Prevention Plan
LACFCD	Los Angeles County Flood Control District
LFD	Low-Flow Diversion
LID	Low Impact Development
MAR	Marine Habitat Beneficial Use Designation
MCM	Minimum Control Measure
mg/l	Milligrams per Liter
MIGR	Migration of Aquatic Organisms Beneficial Use Designation
MPN/mL	Most Probable Number of Organisms per Milliliter
MRP	Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
NA	Not Applicable
NAICS	North American Industry Classification System
NAV	Navigation Beneficial Use Designation
ND	Non-Detects
NPDES	National Pollutant Discharge Elimination System
PCB	Polychlorinated Biphenyl
Permit	Los Angeles Regional Water Quality Control Board Order No. R4-2012-0175
PIPP	Public Information and Participation Program
PMRP	Plastic Pellet Monitoring and Reporting Program
POTW	Publically-Owned Treatment Works
QA/QC	Quality Assurance/Quality Control
RAA	Reasonable Assurance Analysis
RARE	Rare, Threatened, or Endangered Species Beneficial Use Designation

List of Acronyms

Acronym	Definition
Regional Board	Los Angeles Regional Water Quality Control Board
RWL	Receiving Water Limitation
SCCWRP	Southern California Coastal Water Research Project
SHELL	Shellfish Harvesting Beneficial Use Designation
SIC	Standard Industrial Classification
SMB	Santa Monica Bay
SMBB	Santa Monica Bay Beaches
SMB JG7 WMP Group	Santa Monica Bay Jurisdictional Group 7 Watershed Management Program Group
SMB WMA	Santa Monica Bay Watershed Management Area
SPWN	Spawning, Reproduction, and/or Early Development Beneficial Use Designation
SQMP	Stormwater Quality Management Plan
SUSMP	Standard Urban Stormwater Mitigation Plan
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
TMRP	Trash Monitoring and Reporting Plan
USEPA	United States Environmental Protection Agency
WBPC	Water Body-Pollutant Combination
WDID	Waste Discharger Identification
WILD	Wildlife Habitat Beneficial Use Designation
WMA	Watershed Management Area
WMP	Watershed Management Program
WQBEL	Water Quality-Based Effluent Limitation

1
Introduction

1.1 Background and Regulatory Framework

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) has been a participating agency of Jurisdictional Group 7 (JG7) of the Santa Monica Bay Watershed since the adoption of the Santa Monica Bay Beaches Bacteria Total Maximum Daily Loads (TMDLs) in 2003. However, the City of Los Angeles and the other MS4 permittees in JG7 could not reach an agreement for a collaborative approach to satisfying the requirements of the MS4 permit. Therefore, on November 26, 2013 the Regional Board requested that the City and the Los Angeles County Flood Control District (LACFCD), collectively referred to as the Santa Monica Bay JG7 WMP Group (SMB JG7 WMP Group), pursue a WMP instead of an EWMP. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural best management practice (BMP) implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). In December of 2013, the SMB JG7 WMP Group submitted a revised Notice of Intent to develop a WMP for the City of Los Angeles land area within the JG7 area to fulfill the requirements of the Permit.

This WMP, in combination with the JG7 Coordinate Integrated Monitoring Program (CIMP), was prepared to satisfy Part C.1.f of the Permit, which includes the following tasks:

1. Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters within each Watershed Management Area (WMA);
2. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d;
3. Execute an integrated monitoring program and assessment program pursuant to Attachment E – MRP, Part VI to determine progress towards achieving applicable limitations and/or action levels in Attachment G;
4. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the monitoring and reporting program (MRP) to ensure that applicable WQBELs, RWLs and other milestones set forth in the WMP are achieved in the required timeframes; and
5. 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 WMPs and EWMPs from month 6 through the date of program approval.

1.2 SMB JG7 WMP Group Geographical Area

The SMB JG7 WMP Group area is located within the southern portion of the Santa Monica Bay WMA, which encompasses an area of approximately 414 square miles and includes the Santa Monica Bay and land area that drains into the Bay. The boundary of the Santa Monica Bay, as defined for the National Estuary Program, extends from the Los Angeles/Ventura County line to the northwest, southeast toward Point Fermin located on the Palos Verdes Peninsula. The land area that drains into the Bay follows the crest of the Santa Monica Mountains on the north to Griffith Park; then extends south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek, the natural drainage is a narrow coastal strip between Playa del Rey and Palos Verdes (Regional Board, 2011). **Figure 1-1** depicts the location of the SMB JG7 WMP Group within the Santa Monica Bay Watershed.

The full JG7 area includes the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, Rolling Hills Estate, and the City of Los Angeles. This SMB JG7 WMP only addresses the area owned by the City and LACFCD within JG7, which includes the following water bodies as listed in the Basin Plan:

- Los Angeles County Coastal Nearshore Zone
- Royal Palms Beach
- Whites Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

The SMB JG7 WMP area, which consists of land owned by the City and includes any LACFCD infrastructure, totals approximately 1,056 acres, which is approximately 9% of the entire JG7 area within the Santa Monica Bay Watershed. **Figure 1-1** illustrates the extent of the SMB JG7 WMP Group Area. The geographical scope of the SMB JG7 WMP Group area excludes areas of land totaling approximately 47 acres for which the MS4 permittees do not have jurisdiction, including land owned by the Los Angeles Air Force Base Pacific Crest Housing Area. With the exclusion of these areas, the SMB JG7 WMP area covers 976 acres. The majority of the land uses within the WMP area consist of residential (approximately 67%) and vacant/open space (approximately 27%), with the remaining area consisting of a mixture of commercial, educational, and industrial land uses (**Table 1-1**). There are no designated transportation or agricultural land uses in the WMP area. The open space area includes 102 acres of restored coastal sage scrub habitat and hiking trails located within the White Point Nature Preserve.

Table 1-1
SMB JG7 WMP Land Use Summary

Land Use	% of Total
Commercial	2%
Industrial	0.1%
Education	3%
Multi-Family Residential	14%
Single Family Residential	53%
Open Space	27%
Total	100%

The City of Los Angeles JG7 WMP area includes 218 catch basins and 13 storm drain outfalls owned and operated by either the City of Los Angeles or the LACFCD. The majority of the storm drain outfalls in the SMB JG7 WMP area are circular pipes extending from the cliff side, around one hundred feet above the rocky shoreline. The majority of the outfalls themselves are inaccessible at the pipe outlet.

The coastline along, and several inland sites within, the SMB JG7 WMP area is characterized as being subject to landslide and liquefaction hazards (City of Los Angeles Bureau of Engineering, 2014). This characterization was exemplified by the destruction of the SMB 7-7 TMDL shoreline monitoring site due to landslide in 2011.

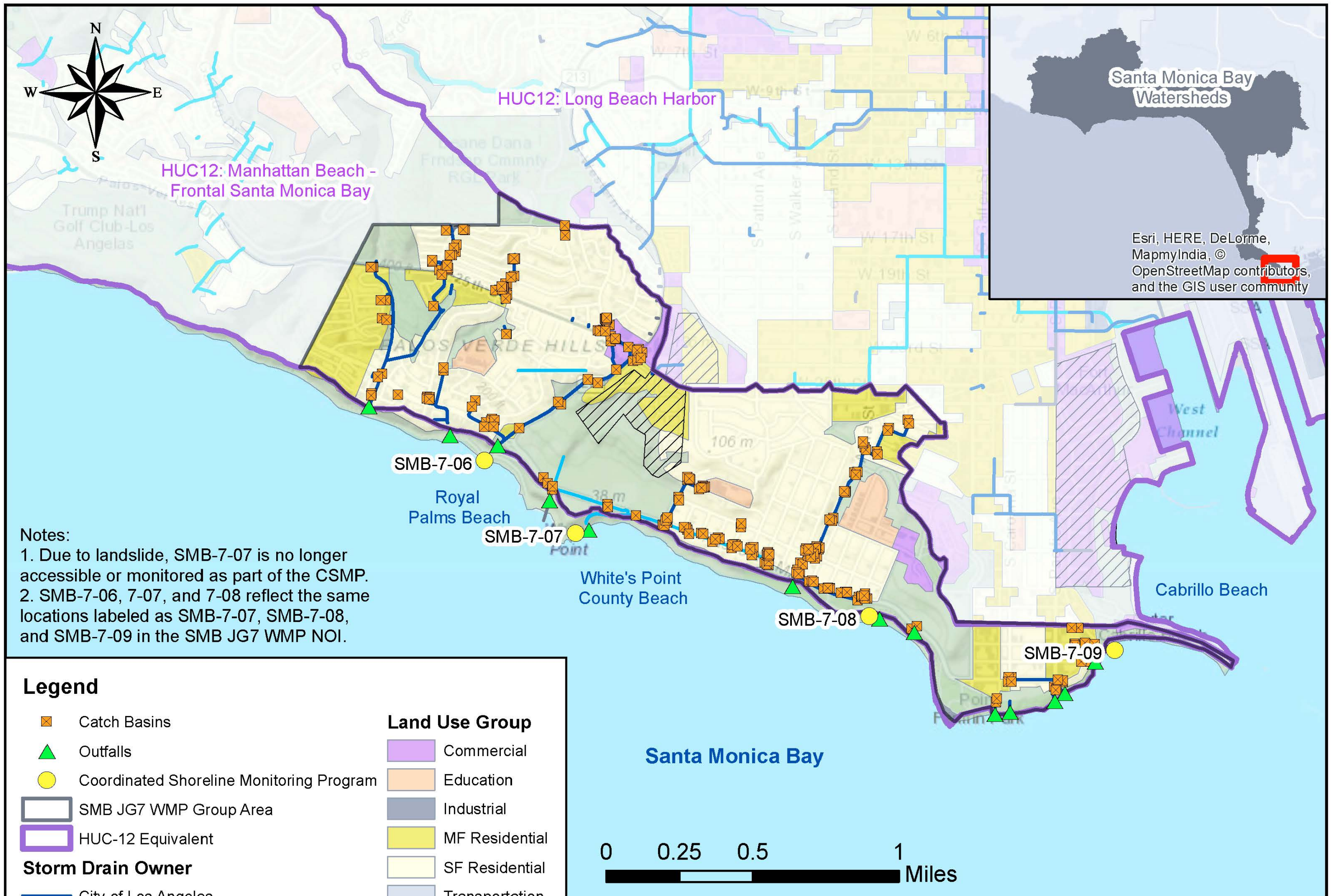


Figure 1-1
Geographical Area
SMB JG7 WMP

December 2014

1.3 Watershed Management Program Development Process

The WMP for the SMB JG7 WMP Group includes four major components, as follows:

1. **Water Quality Priorities:** The identification of water quality priorities is an important first step in the WMP process. Water quality priorities, described in Section 2, are defined for individual constituents within a specific water body, termed as Water Body-Pollutant Combinations (WBPCs). Categories of the WBPCs are defined in the Permit. Priorities are assigned to the WBPCs based on the categorization. The water quality priorities will provide the basis for prioritizing implementation activities within the WMP.

2. **Watershed Control Measures/Minimum Control Measures:** Development of the WMP requires identification of control measures/BMPs, as described in Section 3, expected to be sufficient to meet receiving water and effluent limitations set forth in the MS4 Permit (Regional Board, 2012). BMPs vary in function and type, with each BMP providing unique design characteristics and benefits from implementation. The overarching goal of BMPs in the WMP is to reduce the impact of stormwater and non-stormwater runoff on receiving water quality.

3. **Reasonable Assurance Analysis:** A key element of each WMP is the reasonable assurance analysis (RAA), described in Section 4, which is used to demonstrate *"…that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term"* (Section C.5.b.iv.(5), page 63). The Permit prescribes the RAA as a quantitative demonstration that control measures, specifically BMPs, will be effective. In other words, the RAA not only demonstrates the cumulative effectiveness of BMPs to be implemented, but it also supports their selection. However, due to current zero target load reductions and alternative compliance measures for the identified WBPCs, a quantitative analysis is not necessary at this time. Therefore, the SMB JG7 WMP group has decided to present a qualitative RAA discussion, acknowledging that a quantitative RAA may become necessary in the future based on results of future CIMP monitoring.

4. **Adaptive Management Process:** The WMP is intended to be implemented as an adaptive program as described in Section 5. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time.

1.4 Watershed Management Program Overview

This WMP has been prepared to outline the steps that will be taken by the SMB JG7 WMP Group in compliance with the requirements and deadlines set forth within the MS4 Permit. This document is organized into the following sections:

- **Section 1 –** Introduction
- **Section 2** – Identification of Water Quality Priorities
- **Section 3** – Watershed Control Measures
- **Section 4** – Reasonable Assurance Analysis Approach
- **Section 5** – Adaptive Management Process
- **Section 6** – References

2
Identification of Water Quality Priorities

To develop the WMP, the Permit requires that SMB JG7 WMP Group establish water quality priorities within each WMA. In accordance with the Permit Section IV.C.5(a), this section characterizes the water quality conditions within the SMB JG7 WMP area, identifies water quality priorities, determines water body-pollutant classifications, and assesses pollutant sources. The water quality priorities identified in this section provide the basis for prioritizing project implementation; selecting and scheduling BMPs (if needed); and focusing monitoring activities developed in the CIMP.

2.1 Water Quality Characterization

Figure 2-1 identifies the receiving waters in the SMB JG7 WMP Group area, as depicted in the Water Quality Control Plan, Los Angeles Region (Basin Plan) (Regional Board, 1995, Updated 2011). **Table 2-1** summarizes the beneficial uses for each of these water bodies, as designated in the Basin Plan. As beneficial uses designated as "potential" have not yet been established, these uses will not be evaluated further in the WMP. The SMB JG7 WMP Group area includes the water bodies listed below.

- Los Angeles County Coastal Nearshore Zone
- Royal Palms Beach
- Whites Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

Beneficial use designations for these water bodies include the following:

- **Water Contract Recreation (REC-1):** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2):** Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- **Industrial Services Supply (IND):** Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, firs protection, or oil well re-pressurization.
- **Navigation (NAV):** Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
- **Commercial and Sport Fishing (COMM):** Uses of water for commercial or recreational collection of fish, shellfish, or other organisms intended for human consumption or bait purposes.
- **Marine Habitat (MAR):** Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

- **Preservation of Biological Habitats (BIOL):** Uses of water that support designated areas of habitats, such as Areas of Special Biological Significance (ASBS), established refuges, parks, sanctuaries, ecological reserves, or other areas where the preservation or enhancement of natural resources requires special protection.
- **Migration of Aquatic Organisms (MIGR):** Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
- **Spawning, Reproduction, and/or Early Development (SPWN):** Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
- **Shellfish Harvesting (SHELL):** Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.
- **Wildlife Habitat (WILD):** Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- **Rare, Threatened, or Endangered Species (RARE):** Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

Table 2-1
Beneficial Uses of Water Bodies and Coastal Features Designated in the Basin Plan

Water Body (and Tributaries)	Beneficial Uses											
	REC-1	REC-2	WILD	RARE	IND	NAV	COMM	MAR	BIOL	MIGR	SPWN	SHELL
Los Angeles County Coastal Nearshore Zone^	E	E	E	Ee	E	E	E	E	Ean	Ef	Ef	E
Royal Palms Beach	E	E	E			E	E	E			P	E
Whites Point County Beach	E	E	E			E	E	E			P	E
Point Fermin Park Beach	Not listed in Basin Plan											

E = Existing beneficial use

P = Potential beneficial use

e = One or more rare species utilizes all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f = Aquatic organisms utilize all bays, estuaries, lagoons, and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas that are heavily influenced by freshwater inputs.

an = Point Fermin Marine Life Refuge

^ = Nearshore is defined as the zone bounded by the shoreline or the 30-foot depth contours, whichever is further from the shoreline. Longshore extent is from Rincon Creek to the San Gabriel River Estuary.

2.1.1 Water Quality Objectives/Criteria

The Clean Water Act (CWA) requires that the State Water Resources Control Board (SWRCB) and Regional Boards conduct a water quality assessment that addresses the condition of its surface waters [required in Section 305(b) of the CWA] and provides a list of impaired waters [required in CWA Section 303(d)] that is then submitted to the U.S. Environmental Protection Agency (USEPA) for review and approval. The 2010 Integrated Report and updated 303(d) list were approved by the SWRCB on August 4, 2010 and by the USEPA on October 11, 2011. The 2010 303(d)-listed water bodies and associated pollutants within the SMB JG7 WMP Group area are summarized in **Table 2-2**.

Table 2-2
2010 303(d)-Listed Water Bodies in the SMB JG7 WMP Group Area

Water Body	Pollutant Class	Pollutant	Notes
Santa Monica Bay Beaches	Pathogens	Coliform Bacteria	Addressed by Bacteria TMDL
	Pesticides	DDT	Addressed by PCB/DDT TMDL
	Other Organics	PCBs	Addressed by PCB/DDT TMDL
Santa Monica Bay (Los Angeles County Coastal Nearshore Zone)	Trash	Debris Plastic Pellets	Addressed by Debris TMDL
	Pesticides	DDT (tissue & sediment)	Addressed by PCB/DDT TMDL
	Other Organics	PCBs (tissue & sediment)	Addressed by PCB/DDT TMDL
	Toxicity	Sediment Toxicity	Addressed by PCB/DDT TMDL
	Miscellaneous	Fish Consumption Advisory	Addressed by PCB/DDT TMDL

Water bodies are subject to water quality objectives in the Basin Plan, or Basin Plan Amendments, such as those to implement TMDLs. There are currently three TMDLs in effect for the water bodies within the SMB JG7 WMP Group area as listed in Attachment M of the Permit. These TMDLs are summarized in **Table 2-3**.

Table 2-3
Santa Monica Bay TMDLs

TMDL Name	Agency	Effective Date
SMB Beaches Bacteria TMDL, Reconsideration of Certain Technical Matters of the SMB Beaches Bacteria TMDL, Resolution R12-007	Regional Board	Effective July 2, 2014
SMB TMDL for DDT and PCBs	USEPA	March 26, 2012
SMB Nearshore Debris TMDL, Resolution R10-010	Regional Board	March 20, 2012
SMB Beaches Bacteria TMDL, Dry Weather, Resolution 2002-004[a]	Regional Board	July 15, 2003
SMB Beaches Bacteria TMDL, Wet Weather, Resolution 2002-022[a]	Regional Board	July 15, 2003

[a] This TMDL was revised pursuant to Resolution R12-2007.

Table 2-4 identifies the applicable WQBELs and/or RWLs established pursuant to TMDLs included in Attachment M of the Permit. The water quality objectives as listed in the Basin Plan are also applicable to water bodies based on the designated beneficial uses. The Debris TMDL final WQBELs are effective

March 20, 2020. The effective date of the polychlorinated biphenyl (PCB) and dichlorodiphenyltrichloroethane (DDT) final WQBELs will be specified later in this document, since the USEPA-developed TMDL lacks a compliance schedule. The Bacteria TMDL final WQBELs and RWLs are currently effective for both dry weather and wet weather[2].

Table 2-4
Final Permit RWLs and WQBELs for SMB TMDLs

Reference	Parameter	Effluent Limitation/ Receiving Water Limitation
SMB Nearshore Debris TMDL	Trash – WQBEL	Zero
	Plastic Pellets – WQBEL	Zero
TMDL for PCBs/DDTs (for LA County MS4)	DDT – WLA	27.08 g/yr (based on 3-year averaging period)[2]
	PCBs – WLA	140.25 g/yr (based on 3-year averaging period)[2]
SMB Beaches Bacteria TMDL	Total coliform (daily maximum) – WQBEL	10,000 Most Probable Number (MPN)/100 mL
	Total coliform (daily maximum), if the ratio of fecal-to-total coliform exceeds 0.1 – WQBEL	1,000 MPN/100 mL
	Fecal coliform (daily maximum) – WQBEL	400 MPN/100 mL
	Enterococcus (daily maximum) – WQBEL	104 MPN/100 mL
	Total coliform (geometric mean[1]) – WQBEL/RWL	1,000 MPN/100 mL
	Fecal coliform (geometric mean[1]) – WQBEL/RWL	200 MPN/100 mL
	Enterococcus (geometric mean[1]) – WQBEL/RWL	35 MPN/100 mL

[1]The rolling 30-day geometric mean is calculated based on the previous 30 days. The reopened 2012 TMDL, which has been approved by USEPA, modified this to weekly calculation of a rolling six-week geometric mean using five or more samples, starting all calculation weeks on Sunday.
[2]Group load-based WQBELs that apply to all SMB MS4 dischargers; the individual load-based WQBELs for SMB JG7 WMP Group members would be an area-weighted fraction of this.
MPN/ml = most probable number of organisms per milliliter

Grouped RWLs for the Santa Monica Bay Beaches Bacteria TMDL are also expressed in the Permit in terms of allowable exceedance days (AEDs), which vary by season and by Coordinated Shoreline Monitoring Plan (CSMP) monitoring station. AEDs applicable to SMB 7-6, 7-7, 7-8 and 7-9 are summarized and discussed in **Table 2-6**, presented in the following Section 2.1.4.

[2] Per Resolution 2006-008, the J7 agencies elected to pursue a non-integrated water resources approach to SMB Beaches Bacteria TMDL compliance, which results in a final wet weather compliance deadline of at most 10 years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

2.1.2 QA/QC Criteria

Quality assurance/quality control (QA/QC) criteria have been established to verify that data referenced in this water body characterization are qualified for use. All data used have either been peer reviewed; were submitted as part of an official record, such as in an agency's Annual Report to the Regional Board; or have met QA/QC criteria established by another party, such as the County, City Environmental Health Division, Regional Board, or California Environmental Data Exchange Network (CEDEN), which includes the Bight Program. Data not meeting these criteria have not been used in this water body characterization.

2.1.3 Detailed Data Analysis

A detailed monitoring data analysis was conducted to:

1. Evaluate the status of TMDL compliance;
2. Evaluate the status of 303(d) listings (i.e., whether any WBPCs meet the SWRCB's 303[d] delisting criteria);
3. Identify other WBPCs that meet 303(d) listing criteria; and
4. Identify remaining WBPCs demonstrating exceedance(s) of applicable receiving water limitations.

Monitoring data analyzed are summarized in **Table 2-5**, and existing monitoring stations are shown in **Figure 2-1**. It should be noted that the data presented are receiving water quality data and do not imply MS4 contributions.

Table 2-5
Existing Monitoring Programs

Program Name	Monitoring Period	Monitoring Locations	Parameters Analyzed	Frequency
Coordinated Shoreline Monitoring Program	2004-2013	Santa Monica Bay Beaches	Bacteria	Weekly
Southern California Bight Regional Monitoring	1994 - 2013	Santa Monica Bay Offshore/Nearshore	General suite in 1995 and 1998; General suite in sediment only in 2003 and 2008	Varies by site

2.1.4 TMDL Compliance Status

Table 2-6 summarizes the shoreline monitoring bacteria data from 2003 through 2013 with respect to the number of exceedance days (EDs) at SMB-7-06, SMB-7-07, SMP-7-08 and SMB-7-09, as defined in the TMDL (exceeding one of four single sample daily maximum REC-1 WQOs). Three sites are open beach locations, and as such, any exceedance is not necessarily directly attributable to the MS4. Access to SMB-7-07 was destroyed in a landslide in 2011 and has not been accessible or monitored since 2011. Geometric mean exceedance days are also reported here. A summary of the average, median, minimum, and maximum water quality results from single-sample monitoring at SMB 7-06, SMB-7-07, SMB-7-08, and SMB 7-09 is included in Attachment A. If follow-up samples were collected for weekly sites then those were included in this analysis, which may increase the number of reported EDs. As shown in **Table 2-6**, the summer dry weather AEDs were exceeded eight out of the eleven years monitored (73%) at SMB 7-6, four out of the seven years monitored (57%) at SMB 7-7, three out of the eleven years monitored (27%) at SMB-7-8, and four out of the nine years monitored (44%) at SMB 7-9. The winter dry weather AEDs were exceeded six out of the eleven years monitored (55%) at SMB 7-6, two out of the seven years monitored (30%) at SMB 7-7, one out of the eleven years monitored (9%) at SMB-7-8, and two out of the nine years monitored (22%) at SMB 7-9. The wet weather AEDs were exceeded four out of the eleven years monitored (36%) at SMB 7-6, five out of the seven years monitored (71%) at SMB 7-7, two out of the eleven years monitored (18%) at SMB-7-8, and four out of the nine years monitored (44%) at SMB 7-9. With respect to geomeans, the zero AEDs were exceeded nine out of the eleven years monitored (82%) at SMB 7-6, two out of the seven years monitored (29%) at SMB 7-7, two out of the eleven years monitored (18%) at SMB-7-8, and three out of the nine years monitored (33%) at SMB 7-9. It should be noted that 2005 recorded the most annual rainfall in Los Angeles County history (34 inches), which likely contributed to the abnormal number of exceedances. Additionally, 7-9 was monitored daily, rather than weekly, in 2005, and total coliform at SMB 7-6 was monitored daily between 2003 and 2006.

USEPA's Santa Monica Bay DDTs and PCBs TMDL (USEPA, 2012) relies on a limited dataset to establish stormwater load allocations, relying on a single study (Curren *et al*, 2011) from a single creek (Ballona Creek, which is outside the SMB JG7 WMP area) to extrapolate MS4 wasteload allocations to other SMB watersheds based on percent urban area. The Santa Monica Canyon, Ballona Creek, and Hermosa Beach watersheds combined represent 94% of the developed area draining to Santa Monica Bay. The TMDL does not present sufficient data to differentiate or disaggregate MS4 contributions by subwatershed to the DDT and PCB concentrations observed in Santa Monica Bay.

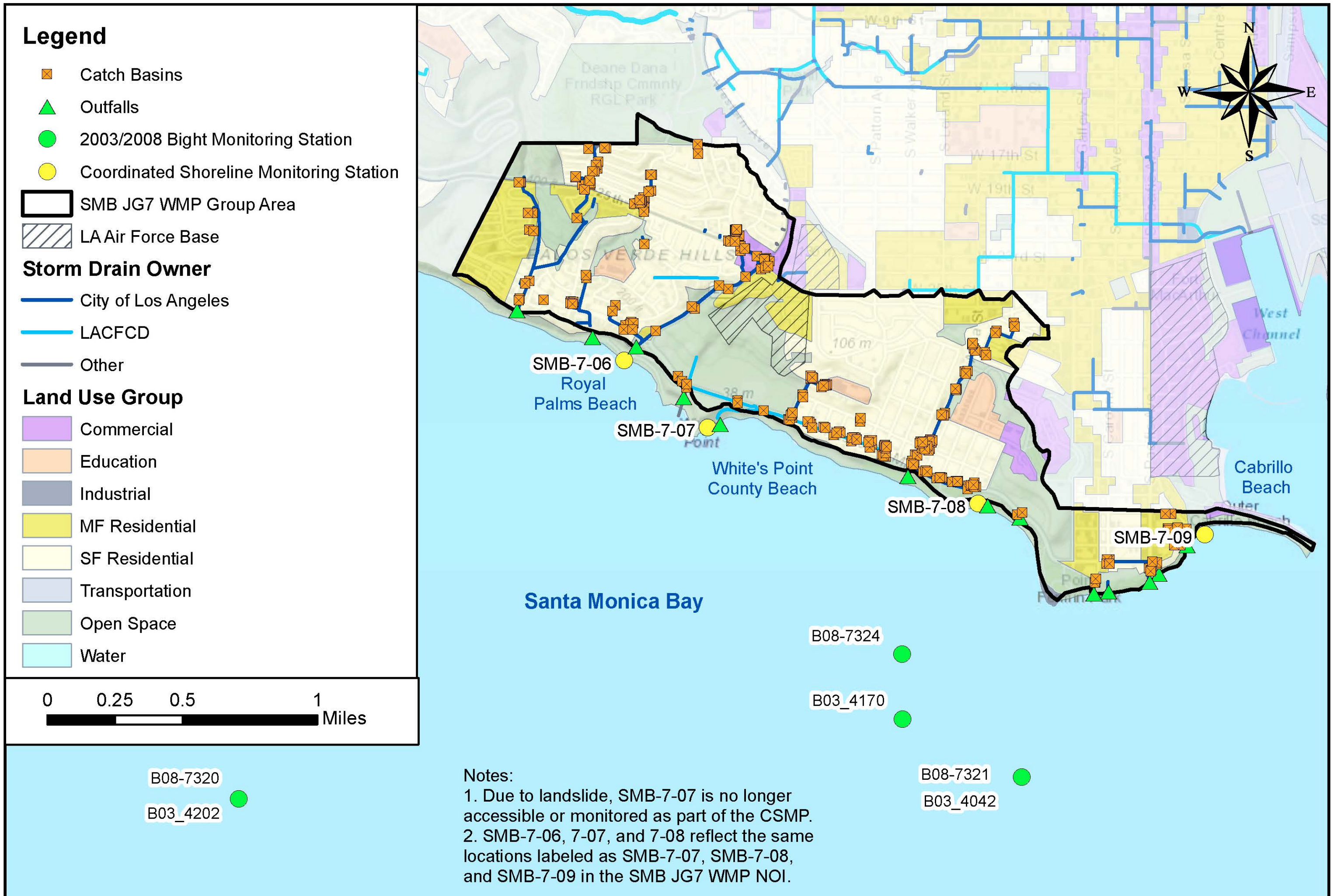


Figure 2-1
Existing Monitoring Stations
SMB JG7 WMP

December 2014

Table 2-6
Summary of Exceedance Days
(bold text signifies Exceedance Days > Allowable Exceedance Days)

Station (type)	Season	AEDs	Number of Exceedance Days per TMDL Year										
			2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
SMB-7-6 (open beach)	Dry-Summer[a]	0	**1**	**1**	**1**	**2**	0	**2**	0	**1**	0	**1**	**1**
	Dry-Winter[b]	1	**3**	1	**11**	1	**2**	0	**5**	1	**2**	**2**	0
	Wet[c]	1[d]	1	1	**28**	1	0	**2**	1	**3**	**2**	1	0
	Geomean[e]	0	**4**	**2**	**10**	0	**1**	**1**	**7**	**5**	**3**	**8**	0
SMB-7-7	Dry-Summer[a]	0	-	**1**	0	**1**	**4**	0	**2**	0	No data – site destroyed by landslide		
	Dry-Winter[b]	1	-	0	0	0	**4**	1	1	**3**			
	Wet[c]	1	-	1	**12**	**6**	**2**	**5**	**9**	0			
	Geomean[e]	0	-	0	0	0	0	**2**	**1**	0			
SMB-7-8 (open beach)	Dry-Summer[a]	0	**1**	**1**	0	0	0	0	0	0	0	**3**	0
	Dry-Winter[b]	1	0	0	**2**	0	0	0	1	0	1	0	0
	Wet[c]	1[d]	0	0	**13**	0	0	0	1	0	**2**	1	0
	Geomean[e]	0	0	0	**3**	0	0	0	**1**	0	0	0	0
SMB-7-9 (open beach)	Dry-Summer[a]	0	-	-	0	**1**	**3**	**1**	0	0	**1**	0	0
	Dry-Winter[b]	1	-	-	0	**2**	0	0	1	1	**2**	0	0
	Wet[c]	1	-	-	**15**	0	0	**5**	1	**3**	**7**	0	0
	Geomean[e]	0	-	-	**1**	0	0	**3**	0	0	**2**	0	0

[a] Summer Dry Weather = April 1 – October 31
[b] Winter Dry Weather = November 1 – March 31
[c] Wet Weather = November 1 – October 31, days with >=0.1 inches of rain and the three days following
[c] 2012-2013 dataset is incomplete and ends on 9/18/2013.
[d] AEDs are based on weekly sampling. Exceedance days were calculated based on the raw data. For example, in cases where more than one sample was collected in a single week, those results were still compared against the weekly AEDs. This approach is consistent with annual monitoring reports, but overestimates actual exceedance weeks.
[e] Geometric means (geomeans) were calculated using the direction in Resolution No. 12-007, calculated weekly as a rolling geometric mean using 5 or more samples, for 6 week periods starting all calculation weeks on Sunday.

2.1.5 Other Water Body-Pollutant Combinations that meet 303(d) Listing Criteria

The offshore Bight sediment data in this area are not considered to be representative of the MS4 discharges, due to distance from the outfalls and given the sample proximities to the Palos Verdes Shelf Superfund site. However, if a comparison were to be made to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, which requires a minimum sample size of 16 for toxicants and 26 for conventional or other pollutants for new listings, the Bight data for each of the monitoring stations depicted in Figure 2-1 do not include a qualifying number of samples (sample size at each location is between 3 and ten for all parameters.)

Therefore, there were no WBPCs identified within the SMB JG7 WMP geographical scope that were found to meet the 303(d) listing criteria.

2.1.6 Remaining Water Body-Pollutant Combinations Demonstrating Exceedance(s) of Applicable Receiving Water Limitations

In addition to PCBs and DDTs, the Bight data also analyzed the following parameter suites: metals, nutrients, PAHs, and organochlorine pesticides. However, due to the distance from the MS4 outfall and proximity to the Palos Verdes Shelf Superfund site which is dominated by historic discharges from the LA County Sanitary Sewer System (LACSD) outfall, this data cannot be used to draw conclusions about impact of MS4 discharges on the Santa Monica Bay.

2.2 Water Body-Pollutant Prioritization

Based on the water quality characterization, the WBPCs identified in **Table 2-7** have been classified into one of three categories, in accordance with Section IV.C.5(a)ii of the Permit. This categorization is intended to prioritize WBPCs in order to guide the implementation of structural and institutional BMPs.

Table 2-7
Water Body Pollutant Prioritization
(Listed in order of compliance deadline, interim and final are included.
Passed deadlines are shown in bold font)

Category	Water Body	Pollutant	Compliance Deadline
1	SMB Beaches	Summer dry weather bacteria	**7/15/2006 for single sample AEDs**
		Winter dry weather bacteria	**7/15/2009 for single sample AEDs**
		Wet weather bacteria	**7/15/2013 for single sample AEDs**[1]
			7/15/2013 for geometric mean (GM)[1]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][2,3]
		PCBs	[No compliance deadline specified in TMDL][2,3]
2	No Category 2 WBPCs have been identified at this time		
3	No Category 3 WBPCs have been identified at this time		

1 Per Resolution 2006-008, the J7 agencies elected to pursue a non-integrated water resources approach to SMB Beaches Bacteria TMDL compliance, which results in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

2 Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, the WLA target was set at existing waste load, so antidegradation conditions exist.

3 Contamination of DDT and PCBs in the sediments of the Santa Monica Bay has led to a 303(d) listing of Fish Consumption Advisory. The Santa Monica Bay TMDL for DDTs and PCBs issued in 2012 addresses the impairment to human health consumption due to DDT and PCBs in the Santa Monica Bay from Point Dume to Point Vicente and the Palos Verde Shelf from Point Vicente to Point Fermin.

As part of the adaptive management process, categorization of future WBPCs may be adjusted based on data obtained from monitoring, source evaluations, and BMP implementation. Data collected as part of the approved CIMP may result in future Category 3 designations in instances when receiving water limits are exceeded and MS4 discharges are identified as contributing to such exceedances. Under these conditions, the appropriate agencies will adhere to Section VI.C.2.a.iii of the Permit.

2.2.1 Category 1 – Highest Priority

WBPCs under Category 1 (highest priority) are defined in the Permit as *"water body-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R [of the Permit]."*

The WMPC of bacteria (wet and dry weather) at the Santa Monica Bay Beaches within the SMB JG7 WMP area (including Royal Palms Beach, White Point Beach, and Point Fermin Park Beach) fall within Category 1 because they are listed in the Santa Monica Bay Beaches Bacteria TMDL. The Implementation Plan for compliance with the Wet Weather Santa Monica Bay Beaches Bacteria TMDL for the larger JG7 documents historical monitoring at eight sampling locations between 1997 and 2000 for indicator bacteria. Based on the historical monitoring having fewer exceedances than the reference beach, the Implementation Plan concluded that *"as JG7 already meets the baseline goals and only needs to implement provisions to prevent "backsliding"; the non-integrated approach will be selected. No milestones are proposed, as existing conditions are the equivalent of compliance with the TMDL"* (Regional Board, 2012). As a result, the Implementation Plan states that JG7 should continue to implement BMPs, review the LA County Sanitation Districts' data, and perform investigations as necessary. Tables M-1 and M-2 of Attachment M to the MS4 Permit also show that the compliance monitoring locations within the SMB JG7 WMP geographical area, SMB 7-6, SMB 7-8, and SMB 7-9 are subject to antidegradation conditions because the beaches have fewer exceedance days than the reference beach. Therefore, there is a zero required load reduction for bacteria, and reasonable assurance is demonstrated.

A Debris TMDL exists for Santa Monica Bay. Section VI.E.5.b(i) of the Permit states, *"Pursuant to California Water Code section 13360(a), Permittees may comply with the trash [debris] effluent limitations using any lawful means. Such compliance options are broadly classified as full capture, partial capture, institutional controls, or minimum frequency of assessment and collection… and any combination of these may be employed to achieve compliance."* While trash will not be modeled as part of the RAA, the RAA will address how the JG7 agencies will comply with the TMDL WQBELs by providing details on the planned implementation of the methods listed above, primarily through their Trash Monitoring and Reporting Program.

Although a USEPA TMDL exists for DDTs and PCBs for Santa Monica Bay, the TMDL relies on a limited dataset outside of the JG7 watershed area to establish stormwater load allocations. The TMDL mass-based waste load allocations for DDTs and PCBs are equivalent to the estimated existing stormwater loads (i.e., based on data used in the TMDL, zero MS4 load reduction is required). As a result, it is anticipated that for the WMP RAA, no reductions in DDT and PCB loading from the JG7 MS4s are required to meet the TMDL WQBELs. And while DDTs and PCBs cannot be modeled as a stormwater pollutant for the RAA (due to the lack of land use event mean concentrations and BMP performance data), it will be qualitatively evaluated. It is also noted that the implementation of future institutional and/or structural BMPs throughout the SMB JG7 WMP area will lead to a reduction in runoff volume and suspended sediment loading from the MS4s, thereby further reducing the existing mass load of any sediment-bound DDTs and/or PCBs to the Santa Monica Bay. For these reasons, while DDT and PCBs will be included as Category 1 pollutants, they will be prioritized lower than bacteria and debris within Category 1, and will continue to be evaluated further through the CIMP monitoring effort.

2.2.2 Category 2 – High Priority

Category 2 (high priority) WBPCs are defined as "pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment."

Sediment toxicity is not included as a Category 2 WBPC in Santa Monica Bay to be consistent with USEPA determinations (USEPA, 2012). This USEPA determination was based on lack of toxicity in regional surveys. The Santa Monica Bay PCB and DDT TMDL cites studies from 1986 to 2008, which report findings of low toxicity in the Santa Monica Bay. For example, in 2008 four samples in Santa Monica Bay showed no toxicity and one sample from the Palos Verdes Shelf near Point Fermin showed a low level of toxicity. This low level toxicity threshold used in the 2008 survey is more conservative than required for the listing policy.

Therefore, there are no WBPCs within the SMB JG7 WMP area that currently qualify as Category 2.

2.2.3 Category 3 – Medium Priority

Category 3 (medium priority) designations are to be applied to WBPCs that are not 303(d)-listed but which exceed applicable receiving water limitations contained in the Permit and for which MS4 discharges may be causing or contributing to the exceedance.

There are no WBPCs within the SMB JG7 WMP area that currently qualify as Category 3 that are not already listed as Category 1.

2.3 Source Assessment

The following data sources have been reviewed as part of the source assessment for bacteria and DDT/PCBs in the Santa Monica Bay subwatersheds:

- Findings from the Permittees' Illicit Connections and Illicit Discharge (IC/ID) Elimination Programs;
- Findings from the Permittees' Industrial/Commercial Facilities Programs;
- Findings from the Permittees' Development Construction Programs;
- Findings from the Permittees' Public Agency Activities Programs;
- TMDL source investigations;
- Watershed model results;
- Findings from the Permittees' monitoring programs, including but not limited to TMDL compliance monitoring and receiving water monitoring; and
- Any other pertinent data, information, or studies related to pollutant sources and conditions that that contribute to the highest water quality priorities.

Since the only receiving water in the SMB JG7 WMP area is the Santa Monica Bay, the following source assessment is broken down by pollutant.

2.3.1 Indicator Bacteria

Wet weather runoff event mean concentrations (EMCs) for fecal coliform, based on the Southern California Coastal Water Research Project (SCCWRP) land use data for the Los Angeles region (Stein *et al*, 2007), indicate that the highest concentrations are expected from agricultural land uses (there are none in the SMB JG7 WMP area), followed by commercial and educational, single family residential, multi-family residential, open space, industrial, and transportation. Commercial and educational land uses account for 2% and 3%, respectively, of all land uses in the J7 WMP area, with single family residential (53%), multi-family residential (14%), and open space (27%). Local activites likely account for the sources of bacteria.

The Santa Monica Bay Beaches Bacteria TMDL for both dry and wet weather was the first bacteria TMDL adopted by the Regional Board in the State of California. The Santa Monica Bay Beaches Bacteria TMDL was recently opened for reconsideration, although the source assessment was not part of this update. As a result, the general findings from the original source assessment remain unchanged. These findings are summarized in the 2012 Basin Plan Amendment for the reopened Santa Monica Bay Beaches Bacteria TMDL (Attachment A to Resolution No. R12-007):

> *"With the exception of isolated sewage spills, dry weather urban runoff and stormwater runoff conveyed by storm drains and creeks is the primary source of elevated bacterial indicator densities to beaches. Limited natural runoff and groundwater may also potentially contribute to elevated bacterial indicator densities during winter dry weather"* (Regional Board, 2012).

The Santa Monica Bay Beaches Bacteria TMDL source assessment maintains that dry weather urban runoff and stormwater runoff is the primary source of elevated bacteria concentrations at Santa Monica Bay beaches. Although definitive information regarding the specific sources of bacteria within the watershed is not presented, speculation provided in the dry weather staff report provides some insight into possible sources:

> *"Urban runoff from the storm drain system may have elevated levels of bacterial indicators due to sanitary sewer leaks and spills, illicit connections of sanitary lines to the storm drain system, runoff from homeless encampments, illegal discharges from recreational vehicle holding tanks, and malfunctioning septic tanks among other things. Swimmers can also be a direct source of bacteria to recreational waters. The bacteria indicators used to assess water quality are not specific to human sewage; therefore, fecal matter from animals and birds can also be a source of elevated levels of bacteria, and vegetation and food waste can be a source of elevated levels of total coliform bacteria, specifically"* (Regional Board, 2002).

The 2010-2011 and 2011-2012 Los Angeles County Municipal Stormwater Permit Individual Reports[3] for the JG7 agencies report that both sanitary sewer overflows and IC/ID, while eliminated shortly after being reported, do sometimes occur in their jurisdiction (but not necessarily within the SMB JG7 WMP area).

Additionally, information on non-MS4 sources of surfzone bacteria were compiled and based on a comprehensive review of Southern California published literature, as part of comments on the reopened Bacteria TMDL (City of Malibu, 2012):

> *"A number of recent Santa Monica Bay studies have further identified and confirmed natural (non-anthropogenic) sources of fecal indicator bacteria (FIB) including plants, algae, decaying organic matter, beach wrack and bird feces – implicating these as potentially significant contributors to exceedances (Imamura et al, 2011; Izbicki et al, 2012). Beach sands, sediments and beach wrack have been shown to be capable of serving as reservoirs of FIB, possibly by providing shelter from ultra violet (UV) inactivation and predation by allowing for regrowth (Imamura et al, 2011;, Izbicki et al, 2012; Lee et al, 2006; Ferguson et al, 2005; Grant et al, 2001; Griffith, 2012; Litton et al, 2010; Phillips et al, 2011; Jiang et al, 2004; Sabino et al, 2011; and Weston Solutions, 2010). In fact, enterococci include non-fecal or "natural" strains that live and grow in water, soil, plants and insects (Griffith, 2012). Thus, elevated levels of enterococci in water could be related to input from natural sources. The phenomenon of regrowth of FIB from either anthropogenic or natural sources has been suggested by several studies as a possible source of beach bacteria exceedances (Griffith, 2012; Litton et al, 2010; Weston Solutions, 2010; Izbicki et al, 2012; Weisberg et al, 2009)."*

Other sources of bacteria during wet weather may include other non-MS4 permitted stormwater discharges such as Industrial General Permit sites, Construction General Permit sites, Phase II MS4 Sites (e.g., college campuses), State/Federal owned lands, non-MS4 open space areas such as wildlife habitat, and the California Department of Transportation (Caltrans).

A dry weather characterization study was conducted in 2002 to provide information for the management of dry weather urban flows to assist in further protecting coastal areas. The study characterized urban runoff water quality and quantity, investigated sources of flow, located previously unidentified drains, and assessed potential mitigation measures including feasibility of dry weather diversion of storm drains to the sewage system. Two of the studied outfalls were located in the JG7 WMP geographic area (SMB 7-6 and SMB 7-7). Observed dry weather flow estimates at these sites are summarized in **Table 2-8**. This study concluded that dry weather discharge did not necessarily lead to exceedances of receiving water objectives due to low flows. Additionally, the conclusion was made that the J7 outfalls are not good candidates for diversions due to low flows (County Sanitation District of Los Angeles, 2002).

[3] The available Annual Reports were reviewed for 2010-2011 and 2011-2012.

Table 2-8
Dry Weather Flow Observations

Location	Date	Flow Estimate
SMB 7-6* (LA030)	06/13/2002	No Flow
SMB 7-6* (LA030)	08/09/2002	Trace
SMB 7-6* (LA030)	10/01/2002	No Flow
SMB 7-7 (LA010)	05/02/2002	Trace
SMB 7-7 (LA010)	05/13/2002	<0.001 cfs

*Observation was made upstream of 7-6

On March 4, 2008, Jurisdictional Group 7 received notices of violation and corresponding orders from the LARWQCB pertaining to the LA MS4 waste discharge requirements. Water sample data from the summer dry weather periods of September 14, 2006 to October 31, 2006 and April 1, 2007 to October 31, 2007 reported exceedances of Enterococcus bacteria levels at monitoring location SMP 7-7. There were 9 alleged instances of violations cited in the notices, four of which were single sample exceedances and five were geometric mean exceedances. A source investigation was conducted to determine the cause of the single sample bacteria exceedances. A site survey conducted on March 14, 2008 revealed potential sources at the discharge point to be episodic human activity, homes along the shoreline, domestic animals, natural occurrences including bird and mammals, sewer system overflow, feral cats, compost pile, and septic systems (Santa Monica Bay Beaches Bacterial TMDL Jurisdiction Group 7, 2008).

2.3.2 DDT and PCBs

As stated previously, limited data are available to characterize sources of DDT and PCBs within Santa Monica Bay, particularly since direct discharges of these pollutants from publically-owned treatment works (POTWs) have ceased. The largest concentration of DDT and PCBs within Santa Monica Bay is contained within the Palos Verdes shelf, which is being addressed by the USEPA as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site. Loadings from the shelf to the Bay are large and have been well characterized (USEPA, 2012).

With respect to stormwater, the TMDL does not specifically characterize MS4 loadings, though it does recognize that "DDT and PCBs are no longer detected in routine stormwater sampling from Ballona Creek or Malibu Creek." However, the TMDL also states that current detection limits used to analyze DDT and PCB concentrations are too high to appropriately assess the water quality.

No other data or source information is available at this time. Once three years of water quality data are collected as part of the CIMP and evaluated consistent with the recommendations by USEPA in the TMDL to utilize a three-year averaging period[4], then further source assessment will be considered and the categorization and prioritization of PCB and DDTs as MS4-related pollutants of concern will be reevaluated.

[4] The three-year averaging period is recommended by the USEPA TMDL in Section 8.2, which reads, *"We recommend that stormwater waste load allocations be evaluated based on a three year averaging period"* (USEPA, 2012). Additionally, Permit Attachment M states that compliance with the PCB and DDT waste load allocations shall be determined based on a three-year averaging period.

3
Watershed Control Measures

The Permit specifies that control measures, also referred to as BMPs, shall be identified to ensure that stormwater discharges meet RWLs and WQBELs as established in the Permit and to reduce overall impacts to receiving waters from stormwater and non-stormwater runoff.

BMPs are typically grouped into two broad categories, structural and institutional. Structural BMPs are physically-constructed control measures that alter the hydrology or water quality of stormwater or non-stormwater within the MS4 and are designated as either centralized or distributed based on their location within a watershed and size of contributing drainage area. Institutional BMPs are source control measures that prevent the release of flow/pollutants or transport of pollutants within the MS4 area, but do not involve construction of physical facilities. Minimum control measures (MCMs) are a subset of institutional BMPs.

Due to the zero required load reductions and the SMB JG7 WMP geography (outfalls are located on unstable cliffs and there are landslide and liquefaction hazards throughout the SMB JG7 WMP area), there are currently no centralized or distributed BMPs other than trash exclusion devices planned in the SMB JG7 WMP area at this time. In the event that CIMP monitoring demonstrates a need for quantitative RAA modeling and BMP implementation, BMPs may be selected based on performance data, subsurface conditions, land uses within the contributing drainage areas, and other relevant characteristics.

3.1 Minimum Control Measures/Institutional BMPs

The Permit requires the implementation of MCMs in Parts VI.D.4 through VI.D.10. These MCMs are similar to the programs required under the previous MS4 Permit (Order No. 01-182).

Although the previous MS4 Permit required implementation of MCMs, some of the key modifications introduced by the current MS4 Permit related to MCMs include:

- The Permit calls for more outreach and education as part of the Public Information and Participation Program (PIPP). Permittees, for example, will be required to maintain a website with stormwater-related educational materials.
- Permittees are expected to record additional information on industrial and commercial facilities within their jurisdiction as part of their Industrial/Commercial Facilities Program. For example, industrial/commercial facilities records will need to list receiving waters for which each respective facility is tributary to.
- The Permit provides more detailed criteria on BMP sizing and specification for use in the Permittees' Planning and Land Development Program, formerly the Development Planning Program, and calls for cumulative annual reporting of implemented mitigation projects.
- An Erosion and Sediment Control Plan (ESCP), which includes elements of a Storm Water Pollution Prevention Plan (SWPPP), replaces the Local SWPPP (L-SWPPP) as a required document for construction activities meeting certain criteria as a prerequisite to building/grading permit issuance.
- The Permit also requires Permittees to use an electronic tracking system to track construction activities within their jurisdiction and mandates more frequent inspection schedules.
- The Public Agency Activities Program includes new requirements such as: implementing an integrated pest management program and tracking pesticide inventory, training of field staff including contracted staff in illicit discharge identification and reporting, creating an inventory of

public facilities with the potential to cause stormwater pollution, and to maintain an inventory of pollutant sources at these facilities.

A comprehensive comparison between program requirements of the previous and current MS4 Permits is summarized in **Table 3-1**. Permittee activities under the Storm Water Management Program are summarized in the Los Angeles County Unified Annual Stormwater Reports; the report for the most recent reporting year is available at http://ladpw.org/wmd/npdesrsa/annualreport/index.cfm (Los Angeles County Department of Public Works, 2012).

As required by the Permit, the agencies in the SMB JG7 WMP group are continuing to implement the MCMs required under the 2001 MS4 Permit until the WMP is approved by the Regional Board. Applicable new MCMs will be implemented by the time the WMP is approved by the Regional Board. A brief description of each Program MCM and the tasks associated with each are summarized next. The implementation summaries of the Program MCM tasks identified are available in the Unified Annual Stormwater Report published by the Los Angeles County Department of Public Works. Documentation that the City and LACFCD hold legal authority to implement the MCMs required under the 2001 MS4 Permit can be found in Attachment B.

The agencies in the SMB JG7 WMP group have also developed mechanisms for tracking information related to new development/re-development projects that are subject to post-construction BMP requirements in Part VI.D.7 of the MS4 Permit.

Table 3-1
Comparison of Stormwater Management Program MCMs

Program Element	Activity	Previous Permit (Order No. 01-182)	Current Permit (Order No. R4-2012-0175)
Public Information and Participation Program	Public Education Program - advisory committee meeting (once per year)	X	
	"No Dumping" message on storm drain inlets (by 2/2/2004)	X	
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	X	X
	Outreach and education	X	X
	Make reporting info available to public	X	X
	Public service announcements, advertising, and media relations	X	X
	Public education materials - proper handling	X	X
	Public education materials - activity specific	X	X
	Educational activities and countywide events	X	X
	Quarterly public outreach strategy meetings (by 5/1/2002)	X	
	Constituent-specific outreach information made available to public	X	X
	Business Assistance Program	X	
	Educate and inform corporate managers about stormwater regulations	X	
	Maintain storm water websites		X
	Provide education materials to schools (50 percent of all K-12 children every two years)	X	X
	Provide principle permittee with contact information for staff responsible for storm water public educational activities (by 4/1/2002)	X	X
	Principal permittee shall develop a strategy to measure the effectiveness of in-school education programs	X	
	Principle permittee shall develop a behavioral change assessment strategy (by 5/1/2002)	X	
	Educate and involve ethnic communities and businesses (by 2/3/2003)	X	X
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	X	X
Industrial/Commercial Facilities Program Industrial/Commercial Facilities Program	Track critical sources – Restaurants	X	X
	Track critical sources - Automotive service facilities	X	X
	Track critical sources – RGOs	X	X
	Track critical sources - Nurseries and nursery centers		X
	Track critical sources – USEPA Phase I facilities	X	X
	Track critical sources - Other federally-mandated facilities [40 Code of Federal Regulations (CFR) 122.26(d)(2)(iv)(C)]	X	X
	Track critical sources - Other commercial/industrial facilities that Permittee determines may contribute substantial constituent load to MS4		X
	Facility information - Name of facility	X	X
	Facility information - Contact information of owner/operator	Name only	X
	Facility information - Address	X	X
	Facility information – North American Industry Classification System (NAICS) code		X
	Facility information – Standard Industrial Classification (SIC) code	X	X
	Facility information - Narrative description of the activities performed and/or principal products produced	X	X
	Facility information - Status of exposure of materials to storm water		X
	Facility information - Name of receiving water		X
	Facility information - ID whether tributary to 303(d) listed water and generates constituents for which water is impaired		X
	Facility information - NPDES/general industrial permit status	X	X
	Facility information - No Exposure Certification status		X
	Update inventory of critical sources annually	X	X
	Business Assistance Program	Optional	X
	Notify inventoried industrial/commercial sites on BMP requirement		Once in 5 years
	Inspect critical commercial sources (restaurants, automotive service facilities, retail gasoline outlets and automotive dealerships)	Twice in 5 years	Twice in 5 years
	Inspect critical industrial sources (phase 1 facilities and federally-mandated facilities)	Twice in 5 years[1]	Twice in 5 years[2]
	Verify No Exposure Certifications of applicable facilities		X
	Verify Waste Discharge Identification (WDID) Number of applicable facilities	X	X
	Source control BMPs	X	X
	Provisions for Significant Ecological Areas (SEAs) (Environmentally Sensitive Areas (ESAs)	X[3]	X
	Progressive enforcement of compliance with stormwater requirements	X	X
	Interagency coordination	X	
Planning and Land Development Program	Peak flow control (post-development stormwater runoff rates, velocities, and duration)	X	X[4]
	Hydromodification Control Plan	In lieu of countywide peak flow control	
	SUSMP (by 3/3/03)	X	
	Volumetric treatment control (SWQDv) BMPs	X	X
	Flow-based treatment control BMPs	X	X
	Require implementation of post-construction Planning Priority Projects as treatment controls to mitigate storm water pollution (by 3/10/2003)	X	X
	Require verification of maintenance provisions for BMPs	X	X
	California Environmental Quality Act process update to include consideration of potential stormwater quality impacts	X	
	General Plan update to include stormwater quality and quantity management considerations and policies	X	
	Targeted employee training of development planning employees	X	
	Bioretention and biofiltration systems		X
	SUSMP guidance document	X	
	Annual reporting of mitigation project descriptions		X
Development Construction Program	Erosion control BMPs	X	X
	Sediment control BMPs	X	X
	Non-storm water containment on project site	X	X
	Waste containment on project site	X	X
	Require preparation of a Local SWPPP for approval of permitted sites	X	X
	Inspect construction sites on as-needed basis		X
	Inspect construction sites equal to or greater than one acre	Once during wet	Once every two

Program Element	Activity	Previous Permit (Order No. 01-182)	Current Permit (Order No. R4-2012-0175)
		season	weeks[5], monthly
	Electronic tracking system (database and/or Geographic Information System)		X
	Required documents prior to issuance of building/grading permit	L-SWPPP	ESCP/SWPPP
	Implement technical BMP standards		X
	Progressive enforcement	X	X
	Permittee staff training	X	X
Public Agency Activities Program	Public construction activities management	X	X
	Public facility inventory		X
	Inventory of existing development for retrofitting opportunities		X
	Public facility and activity management	X	X
	Vehicle maintenance, material storage facilities, corporation yard management	X	X
	Landscape, park, and recreational facilities management	X	X
	Storm drain operation and maintenance	X	X
	Streets, roads, and parking facilities maintenance	X	X
	Parking facilities management	X	X
	Emergency procedures	X	X
	Alternative treatment control BMPs feasibility study	X	
	Municipal employee and contractor training		X
	Sewage system maintenance, overflow, and spill prevention	X	
Illicit Connection/Illicit Discharge (IC/ID) Elimination Program	Implementation program	X	X
	MS4 Tracking (mapping) of permitted connections and illicit connections and discharges	X	X
	Procedures for conducting source investigations for IC/IDs	X	X
	Procedures for eliminating IC/IDs	X	X
	Procedures for public reporting of ID		X
	IC/ID response plan	X	X
	IC/IDs education and training for staff	X	X

[1] Tier 2 facilities may be inspected less frequently if they meet certain criteria
[2] Subject to change based on approved JG7 WMP strategy
[3] For environmentally sensitive areas and impaired waters
[4] Maintain pre-project runoff flow rates via hydrologic control measures
[5] Sites of threat to water quality or discharging to impaired water; frequency dependent on chance of rainfall

3.1.1 Customization of MCMs

In lieu of the requirements of Parts VI.D.4 through VI.D.10 of the Permit, the SMB JG7 WMP Group may customize MCMs within each of the general categories. The motivation for considering customization is made more apparent in the Regional Board's response to a comment that the Permit should establish criteria that will be used to support any customization of MCMs; the Regional Board responded with the following:

> *The Order specifies that at a minimum, Permittees' programs shall be consistent with 40 CFR section 122.26(d)(2)(iv)(A)-(D). In response to comments that the Order is overly prescriptive, specifying criteria could restrict customization within these categories of minimum control measures. The criterion to allow customization is based on showing equivalent effectiveness, for example, a municipality who has identified a group of facilities within their jurisdiction as the largest source of constituents could be allowed to focus their inspection efforts on controlling the constituents from this subset of facilities.*
> (http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/StormSewer/CommentLetters/E_MCM%20Matrix%2010-26-12%20Final.pdf)

The opportunity for customization may provide benefit by allowing the SMB JG7 WMP Group to assess the effectiveness of their current programs and to modify their programs to better serve local conditions and objectives. If an effectiveness assessment is conducted on a specific MCM activity and it can be reasonably shown that customization of the MCM would result in equal or improved effectiveness on attitudes or knowledge, behavior or implementation, load reduction, or water quality, then a defensible recommendation for modification of that activity can be made, resulting in greater resources available for more effective activities.

The SMB JG7 WMP Group is not planning to customize MCM activities at this time. However, in the event that MCM customization would be beneficial to the identified WBPCs or if CIMP results indicate adjustments would be beneficial and/or needed, the first step in customizing MCM activities would be the development of a framework to assess the effectiveness of each MCM in its current implementation. For each MCM that can be assessed in this manner, recommendations for customizations can be developed with reasonable assurance of impact to effectiveness.

The California Stormwater Quality Association (CASQA) provides such a framework for the effectiveness assessment of Stormwater Management Programs (CASQA, 2006). The outcome is a hierarchy that categorizes the classification of outcome types (levels) that will allow MCMs to be placed into one or more categories for subsequent outcome assessment. The outcome levels, Level 1 through Level 6, are summarized in **Figure 3-1**.

Figure 3-1
General Classification of Outcome types (adapted from CASQA)

	Benefits	Limitations
Level 6 - Changes in Receiving Water Quality	• Achieves ultimate goal of protection of receiving water	• Very difficult to determine for specific MCMs • Sees influence from non-MS4 sources
Level 5 - Changes in Urban Runoff and Discharge Quality	• Indicates direct impact on water quality	• Requires substantial monitoring
Level 4 - Load Reductions	• Controls the source • Valuable for making broad comparisons	• Requires development of a baseline to estimate
Level 3 - Behavioral Change and BMP Implementation	• Great first indicator of potential water quality improvement	• Requires observation and inspection
Level 2 - Changes in Attitudes, Knowledge, and Awareness	• Can provide the basis for measuring behavioral change	• Many different factors influence levels of public involvement
Level 1 - Compliance with Activity-Based Permit Requirements	• Easy to determine (reporting)	Does not indicate direct impacts

3.1.2 MCMs and Outcome Levels

The outcome types in this effectiveness assessment framework are interrelated. The Permit's stormwater management program is, by design, intended to improve the water quality in receiving waters. The means by which this goal is intended to be met is through the implementation of compliance measures by the SMB JG7 WMP Group. Compliance with these activity-based measures results in Level 1 outcomes. Assessments of these activities can provide further understanding of the outcomes they have. Ideally, each activity will contribute to the improvement at the Level 6 receiving water quality level; however, tracking effectiveness at this level is difficult.

A summary of the MCM activities of the agencies within the SMB JG7 WMP Group is included in the 2011-12 Annual Stormwater Report (Los Angeles County Department of Public Works, 2012). In addition to the standard reporting, the agencies answered a list of questions in an Assessment of Program Effectiveness. This summary largely includes responses that may be considered as Level 1 outcomes (compliance) with Level 2, Level 3, and Level 4 outcomes for select MCMs. Several obstacles inhibit the ability to achieve a Level 5 or Level 6 assessment, including:

- Available budget;
- Lack of comprehensive monitoring;
- Timing of MCM activities and corresponding runoff events; and/or
- General complexity of the hydrology and conveyance.

All SMB JG7 WMP Group members were in compliance with the Permit during the 2011-12 reporting year (Level 1 outcome). **Table 3-3** summarizes effectiveness assessment metrics and potential outcomes associated with select MCMs within each Program Element of the Storm Water Management Program. The following is a brief description of the Program MCMs and outcome levels that can be achieved through the effectiveness assessment framework described.

Public Information and Participation Program

The PIPP is intended primarily to reach out and educate the general public, students, business owners, facility operators, city staff, and others on stormwater. This outreach is accomplished in many ways; examples include "No Dumping" messages on storm drain inlets; public education materials; information

websites; community events; reporting hotlines; and specialized awareness programs, such as the used oil program. The program elements are intended to directly impact awareness and the behavior of different target audiences (Level 2 and Level 3 outcomes). Consequently, these behavioral changes may impact constituent loads to the MS4 indirectly, but the actual Level 4 through Level 6 impact of a specific MCM in this category may be difficult to quantify.

Industrial/Commercial Facilities Program

Permittees are required to conduct an Industrial/Commercial Facilities Program designed to prevent illicit discharges, reduce discharges of stormwater, and prevent industrial/commercial discharges to the MS4 from causing or contributing to receiving water quality exceedances. These facilities are tracked and inspected to ensure use of BMPs to control stormwater discharges. In addition, the program aims to contribute to the education of business owners and facility operators regarding SWPPP. The effectiveness of this program can be assessed leading to insight on how awareness (Level 2) and BMP implementation (Level 3) are affected.

Planning and Land Development Program

The Planning and Land Development Program involves developers early in the land development stage, with the integration of BMPs and Low Impact Development (LID) controls to reduce constituent loading to the MS4 and minimize runoff intensity generated from impervious areas. Behavioral change (Level 3) can be assessed through permitting staff observations. Also, it may be possible to assess constituent load reductions (Level 4) through land developer BMP choices and water quality of runoff entering the MS4 (Level 5) if monitoring stations are considered during the planning stage of development and redevelopment.

Development Construction Program

Similar to the Planning and Land Development Program, the Development Construction Program establishes requirements for construction activities to eliminate illicit discharges and prevent water quality violations from stormwater discharges from the construction site. The Program establishes criteria for BMPs and controls through an Erosion and Sediment Control Plan, with elements of a SWPPP. The effectiveness of this program can be assessed through inspections to verify BMP implementation (Level 3). Level 2 awareness outcomes can be assessed through the use of a website that informs contractors on proper BMP selection and prerequisite checklists for permitting.

Public Agency Activities Program

Activities ranging from street sweeping, catch basin cleaning, public facility maintenance, and storm drain operation fall under the Public Agency Activities Program. These activities are essential MCMs that can also be measured for effectiveness. Level 3 through Level 5 outcomes (behavior, load reduction, MS4 water quality) can all be assessed through appropriate evaluation metrics. The impact to receiving water quality (Level 6) may be possible to determine if appropriate monitoring is in place, with phased implementation of MCM activities to isolate performance evaluation.

Illicit Connections and Illicit Discharges Elimination Program

IC/IDs are controlled through the IC/ID Elimination Program and by implementing a procedure for reporting, tracking, and responding to reports of IC/IDs, as well as establishing protocols for the regular inspection of storm drains. The effectiveness of the reporting procedure can be assessed on a Level 2 (awareness) basis, and response activities can have their effectiveness determined directly through monitoring of the MS4 water quality (Level 5). A quantitative analysis of behavioral change (Level 3) as a result of enforcement actions is also achievable.

Catch Basin Retrofit Program

The City of Los Angeles JG7 WMP area contains 218 catch basins, all of which will be retrofitted with catch basin inserts in order to comply with the Santa Monica Bay Nearshore and Offshore Debris TMDL requirements. The catch basin inserts meet the RWQCB definition of full capture device as described in the TMDL and the 5-millimeter perforated inserts can treat a storm flow of a 1-year, 1-hour storm. Catch basin inserts are planned for installation according to the schedule presented in **Table 3-2** (City of Los Angeles, TRMP, 2012). Agencies responsible for the implementation of the catch basin retrofit program include Los Angeles Flood Control District, and the City of Los Angeles.

Table 3-2
Catch Basin Retrofit Implementation Schedule

RWQCP Implementation Goal	Date
57 catch basin opening cover and/or insert retrofits (cumulative) (26% of load reduced)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (100% of load reduced)	July 2016

3.1.3 Next Steps to MCM Customization

The assessment framework outlines the process to determine baseline MCM effectiveness, providing the foundation for customization. Pending the results of the approved CIMP, opportunities for modifying MCM activities may be proposed by the SMB JG7 WMP Group as part of the adaptive management process.

It should be noted, however, that institutional BMPs (or MCMs) such as street and median sweeping implementations, drain inlet and conveyance system cleaning, pet waste program enhancements, etc. are expected to continue to cumulatively result in a pollutant load reduction of up to or approximately 5%. Additionally, assuming past data also reflect future trends, it is anticipated that 0.1 – 0.3% of residential, commercial, and industrial properties will implement LID annually through development or redevelopment projects[5]. Although RWLs are currently being met, it is anticipated that implementation of LID will further enhance the water quality in this region.

[5] 0.1% annual estimate is based on a review of development/redevelopment projects within the SMB JG7 WMP Group area over the past 10 years assuming a 0.2 acre lot size. 0.2% annual estimate is based on the area-weighted projected development/redevelopment rate for residential, commercial, and industrial land uses reported by the City in the Ballona TMDL Implementation Plan.

Table 3-2
Effectiveness Assessment Measures for Various Activities under the Storm Water Management Program

Program MCM	Permittee Activity	Possible Assessment Metric	Outcome Level
Public Information and Participation Program	Advertising / media campaigns (e.g., Used Oil / Used Oil Filter Program)	Year-over-year change in no. of impressions	L2
		Survey results	L2, L3
	Educational programs (e.g., Generation Earth, Environmental Defenders, public workshops)	Year-over-year change in attendance	L2
		Quiz results	L2, L3
	E-Waste collection events	Amount of Household Hazardous Waste/E-Waste	L3, L4
	888-CLEAN-LA hotline	Change in no. of calls	L2
	www.888CleanLA.com	No. of unique visitors / document downloads	L2
Industrial/Commercial Facilities Program	Website on program details	No. of unique visitors / document downloads	L2
	Electronic tracking	Inspections: change in no. of Notices of Violation (NOV) / non-compliance	L3
Planning and Land Development Program	Pre-permitting assessment	No. of developers incorporating BMPs and LID in early-stage	L3
	Annual reporting	% of stormwater capture	L3, L4
	Integrated control measures	Measure performance through planned monitoring	L5
Development Construction Program	Website on program details	Number of hits / document downloads	L2
	Electronic tracking	Inspections: change in no. of NOV / non-compliance	L3
Public Agency Activities Program	Street sweeping	Street sweeper fleet (technology)	L3
		Year-over-year change in debris collected	L3, L4
	Catch basin cleaning	Year-over-year change in trash collected	L3, L4
	Installation of trash receptacles	Observations: cleanliness of public roadways	L3
	Sanitary sewer overflow response	Monitoring results of MS4 water quality	L5
IC/ID Elimination Program	IC/ID reporting hotline	Year-over-year change in no. of calls	L2
	Termination of IC/ID	Outfall monitoring: change in water quality	L5
	Enforcement actions	Change in occurrence	L3
Other	Support for Senate Bill (SB) 346 (Brake Pad Initiative)	% of vehicles with reduced-copper-content brake pads	L4

4
Reasonable Assurance Analysis

Typically, an important component of the WMP is the RAA. The RAA is a process that is used to demonstrate that institutional and structural control measures are expected to be sufficient for achieving applicable WQBELs and/or RWLs for the water body pollutant combinations that have compliance deadlines within the Permit term. In addition to using the RAA as a means to determine the efficacy of existing and potential control measures, the RAA also facilitates the selection of BMPs as well as the prioritization of BMP implementation.

For the SMB JG7 WMP, there are currently zero required load reductions for the Category 1 WBPCs: bacteria at the Santa Monica Bay Beaches and PCBs/DDTs in the Santa Monica Bay. Compliance with the Debris TMDL is being demonstrated through retrofitting of catch basins as outlined in the Trash Monitoring and Reporting Program (City of Los Angeles Department of Public Works, 2012). No Category 2 or Category 3 WBPCs have been identified based on currently available monitoring data. Furthermore, it is anticipated that implementation of MCMs and related activities will progressively improve water quality.

Therefore, no quantitative RAA modeling is required for this WMP. For purposes of completeness, however, each Category 1 WBPC is qualitatively discussed below.

4.1 Bacteria

Because the compliance monitoring locations within the SMB JG7 WMP geographical area, SMB 7-6, SMB 7-8, and SMB 7-9 are subject to antidegradation conditions (i.e., the beaches have fewer exceedance days than the reference beach), there is therefore a zero required load reduction for bacteria (because target load reductions are set equal to the load of the reference beach), and reasonable assurance is demonstrated. Additionally, when occasional exceedances were investigated, the cause was often the results of isolated local beach activities, which were ceased upon discovery. As part of the adaptive management process based on monitoring data collected through the approved CIMP, structural and/or nonstructural BMPs may be proposed if needed.

4.2 PCBs and DDTs

The Santa Monica Bay TMDL for DDTs and PCBs developed WLAs for stormwater throughout the Santa Monica Bay watershed. Because the SMB JG7 WMP group area contribution is not distinctly defined in the TMDL, the WLAs assigned to the entire Santa Monica Bay WMA as a whole are being used for this discussion. Table 6-3 in the TMDL lists the existing annual DDT and PCB loads as compared to the annual maximum allowable loads. The existing estimated loads for all of Santa Monica Bay and most of the individual watersheds are estimated to be lower than the maximum allowable loads. As such, the WLAs for the entire Santa Monica Bay WMA were set equal to the existing estimates of annual loads for DDTs and PCBs as 28 grams per year (g/yr) and 145 g/yr, respectively. Therefore, there is a zero required load reduction for PCBs and DDTs, and reasonable assurance is demonstrated.

As part of the adaptive management process based on monitoring data collected through the approved CIMP, additional structural and/or nonstructural BMPs may be proposed if needed. Additionally, if the loads are found to be higher than estimated, but still less than the maximum allowable loads, there may be potential for the WLA to be revised.

4.3 Debris, and Plastic Pellets

Compliance with the Debris TMDL will be met through a phased retrofit of all 218 catch basins throughout the JG7 WMP area (182 City owned and 38 County owned) by 2016, ahead of the Regional Board implementation goals for 2020 completion date. Consistent with the City's Trash Monitoring and Reporting Plan (TMRP) (City of Los Angeles Department of Public Works, 2012), *"vertical insert[s] with 5-mm openings and flow activated opening screen covers are the best suited for implementation within the City to achieve compliance with Trash TMDLs"*.

There are no industrial facilities within the SMB JG7 WMP area that use, store, transport, manufacture, or handle plastic pellets. Therefore, the City's Plastic Pellet Monitoring and Reporting Plan (PMRP) will only include an emergency response plan.

5
Adaptive Management Process

The Notice of Intent submitted to the Regional Board in December 2013 provided a schedule of interim milestones for the development of the CIMP and WMP Plan. At this time, the SMB JG7 WMP Group does not anticipate any deviations from the schedule. Completed milestones and projected completion dates for future milestones are presented in **Table 5-1.** The catch basin retrofit schedule, as provided in the TMRP, is also included in the table.

Table 5-1
WMP Schedule of Interim and Final Milestones

Deliverable	Planned Date of Completion
Submit Revised Final Draft WMP to the Regional Board	January 2015
Submit Final Draft CIMP to the Regional Board	June 2014
Submit Revised Final CIMP to the Regional Board	April 2015
57 catch basin opening cover and/or insert retrofits (cumulative) (26%)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (74%)	July 2016

The WMP is intended to be implemented as an adaptive program. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time.

5.1 Compliance Schedule

The compliance deadlines in the Santa Monica Bay Beaches Bacteria TMDL are currently in effect for SMB 7-6, SMB 7-8, and SMB 7-9. A new SMB 7-7 will be identified to replace the previous site that was destroyed by a landslide, this location will be identified in the revised CIMP. The EPA TMDL for PCBs and DDTs does not include a compliance schedule for the WLAs for the Santa Monica Bay WMA. However, to demonstrate compliance with the TMDL, DDTs and PCBs will be assessed by monitoring the sediment fraction at the J7 MS4 outfall monitoring point using a three year averaging period, with the first compliance assessment three years after CIMP implementation.

Part VI.C.8 of the Permit details the adaptive management process to be included in the WMP that includes the following requirements:

i. Permittees shall adapt the WMP to become more effective every two years from the date of program approval based on, but not limited to, a consideration of:

   (1) Progress toward achieving WQBELs and/or RWLs;

   (2) Permittee monitoring data;

   (3) Achievement of interim milestones;

   (4) Re-evaluation of water quality priorities and source assessment;

(5) Non-Permittee monitoring data;

(6) Regional Board recommendations; and

(7) Recommendations through a public participation process.

ii. Permittees shall report any modifications to the WMP in the annual report.

iii. Permittees shall implement any modifications to the WMP upon approval by the Regional Board or within 60 days of submittal if the Regional Board expresses no objections.

The adaptations to the WMP as called for in the adaptive management process essentially include a re-evaluation of water quality priorities, an updated source assessment, an effectiveness assessment of watershed control measures, and a RAA. The CIMP will gather additional data on receiving water conditions and stormwater/non-stormwater quality to inform these analyses. This process will be repeated every two years as part of the adaptive management process.

5.2 Re-Characterization of Water Quality Priorities

Water quality within the SMB JG7 WMP Group will be re-characterized using data collected as part of the approved CIMP. WBPCs may be updated as a result of changing water quality. Category 3 WBPCs will be identified based on data collected as part of the approved CIMP. These classifications will be important for refocusing improvement efforts and informing the selection of future watershed control measures.

Demonstration that MS4 discharges have caused or contributed to the exceedance of receiving water limitations will be made if both of the following criteria are met:

- Simultaneously collected water samples, as consistent with the CIMP, exceed the receiving water limitations as sampled in the receiving water and exceed the WQBELs, action levels as defined in Appendix G, or receiving water limits, in that order, at the MS4 outfall and
- The number of simultaneous samples and simultaneous exceedances meet the criteria in either Table 3.1 (Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Toxicants) or Table 3.2 (Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Conventional or Other Pollutants) in California's Water Control Policy (State Water Resources Control Board, 2004).

5.3 Source Assessment Re-evaluation

The assessment of possible sources of water quality constituents will be re-evaluated based on new information from stormwater outfall monitoring, receiving water monitoring, and from Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) which are part of the CIMP implementation efforts

The SMB J7 Revised CIMP (2015) maintains that the Non-Stormwater Program provides an assessment of whether significant non-stormwater discharges are potentially impacting the receiving water and determines whether significant non-stormwater discharges are allowable. To this end, all major outfalls will be screened prior to dry-weather monitoring through an outfall monitoring and screening program. The outfall screening program will include updating outfall inventory, measuring observed flows, and testing for E.coli where flows are observed. If an outfall exhibits significant non-stormwater discharges, the SMB JG7 WMP Group will complete source identification activities. The information collected through monitoring and source identification efforts will be used to determine if the site is attributed to illicit discharges (City of Los Angeles, 2014).

An initial field survey was conducted for the identification of outfalls in the JG7 WMP Group area on April 15, 2014[6]. The SMB JG7 Group will perform three outfall screenings in the first year after CIMP approval. If any outfalls are identified as producing significant non-stormwater discharges, based on flow and bacteria sampling, a source identification investigation will be conducted to identify potential sources of non-stormwater discharge which may include taking field measurements to characterize the discharge, following dry-weather flows upstream, or compiling and reviewing available resources such as past monitoring data or aerial photography.

If the source is determined to be an illicit discharge, then the Permittee must implement procedures to eliminate the discharge consistent with IC/ID requirements and document actions. If the source is authorized, conditionally exempt, or originating from natural flows, then the source will be documented per CIMP requirements. If the source is unknown, then the Permittee must conduct monitoring consistent with Part IX.G of the Monitoring and Report Program MRP. Finally, for sources originating upstream of the SMB JG7 WMP Group, the Permittee must inform the upstream WMA and Regional Board within 30 days.

The identification of non-MS4 and MS4 pollutant sources is an essential component of the WMP because it determines whether the source can be controlled by watershed control measures. As further monitoring is conducted and potential sources are better understood, the assessment becomes more accurate and informed.

5.4 Effectiveness Assessment of Watershed Control Measures

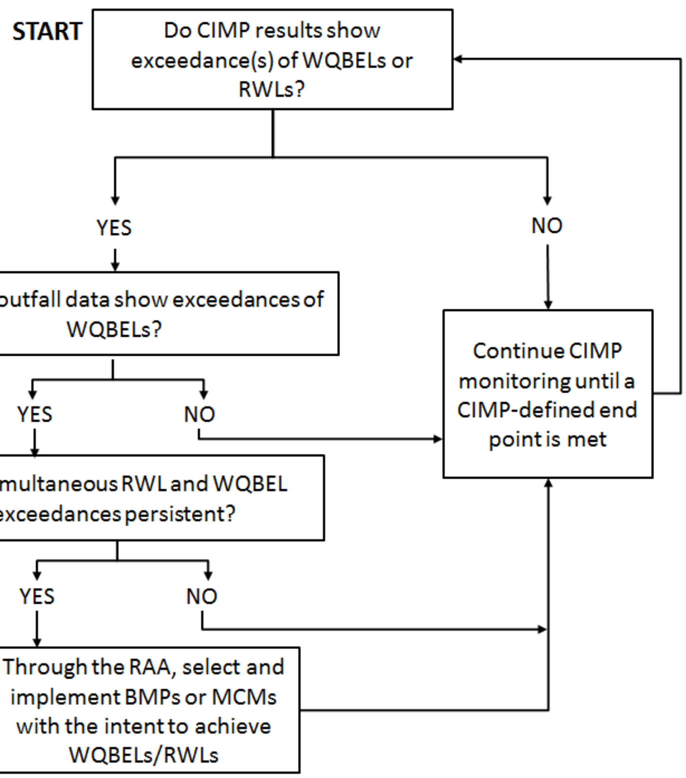
The evaluation of BMP effectiveness is an important part of the adaptive management process and the overall WMP. Implementation of the CIMP can provide a quantitative assessment of structural BMP effectiveness, if BMPs are implemented in the future, as it relates to actual pollutant load reduction to determine how selected BMPs have performed at addressing established water quality priorities. In addition, the adaptive management process is a required step for the customization of MCMs as detailed previously. Effectiveness assessment becomes important for the selection of future control measures to be considered.

5.5 Update of Reasonable Assurance Analysis

The RAA is an iterative process that depends on the continuous refinement and calibration of the watershed models when used. Data gathered as a result of the CIMP will support adaptive management at multiple levels, including (1) generating data not previously available to support model updates (if through the course of the CIMP, modeling becomes necessary in the SMB JG7 WMP), and (2) tracking improvements in water quality over the course of WMP implementation. This process is illustrated in **Figure 5-1**.

[6] The survey conducted in 2014 was based on the SMB JG7 WMP boundary as defined by the Regional Board's EWMP shapefile provided on their website. However, this boudary has since been revised to include the Point Fermin area and will be updated in the Revised CIMP.

Figure 5-1
Adaptive Management Process



6 References

CASQA, 2006. “An Introduction to Stormwater Program Effectiveness Assessment.” White Paper: http://www.scvurpppw2k.com/pdfs/0405/CASQA%20White%20Paper_An%20Introduction%20to%20Stormwater%20Program%20Effectiveness%20Assessment4.pdf.

City of Los Angeles and LACFCD, 2014. Coordinated Integrated Monitoring Plan (CIMP) for the City of Los Angeles Area in Jurisdictional Group 7 of the Santa Monica Bay Watershed. June.

City of Los Angeles Department of Public Works, 2012. Trash Monitoring and Reporting Plan: Santa Monica Bay Nearshore and Offshore Debris TMDL. September 19.

City of Malibu, 2012. Comment Letter – Bacteria TMDL Revisions for Santa Monica Bay Beaches. May 7, 2012.

County Sanitation District of Los Angeles, 2002. Dry Weather Characterization Study. Supplemental Environmental Project No. 1 (SEP No. 1) Final Report. December 30.

Curren, J., S. Bush, S. Ha, M.K. Stenstrom, S. Lau, I.H. Suffet, 2011. Identification of subwatershed sources for chlorinated pesticides and polychlorinated biphenyls in the Ballona Creek watershed. Science of the Total Environment 409: 2525-2533.

Ferguson, D.M., Moore, D.F., Getrich, M.A., and M.H. Zhowandai, 2005. “Enumeration and speciation of enterococci found in marine and intertidal sediments and coastal water in southern California.” Journal of Applied Microbiology 99(3).

Grant, S.B., Sanders, B.F., Boehm, A.B., Redman, J.A., Kim, J.H., Mrse, R.D., Chu, A.K., Gouldin, M., McGee, C.D., Gardiner, N.A., Jones, B.H., Svejkovsky, J., Leipzig, G.V., and A. Brown, 2001. “Generation of Enterococci Bacteria in a Coastal Saltwater Marsh and its Impact on Surf Zone Water Quality.” Environmental Science and Technology 35(12).

Griffith, J.F., 2012. “San Diego County Enterococcus Regrowth Study.” SCCWRP Technical Report.

Imamura, G.J., Thompson, R.S., Boehm, A.B., and J.A. Jay, 2011. “Wrack promotes the persistence of fecal indicator bacteria in marine sands and seawater.” FEMS Microbiology Ecology 77(1).

Izbicki, J., Swarzenski, P., Burton, C., and L.C. Van DeWerfhorst, 2012. “Sources of fecal indicator bacteria to groundwater, Malibu Lagoon, and the near-shore ocean, Malibu, California.” Submitted 2012.

Jiang, S., McGee, C., Candelaria, L., and G. Brown, 2004. “Swimmer Shedding Study in Newport Dunes, California. Final Report.” http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/tmdl/docs/swimmerreport.pdf

Lee, C.M., Lin, T.Y., Lin, C.C., Kohbodi, G.A., Bhatt, A., Lee, R., and J.A. Jay, 2006. “Persistence of fecal indicator bacteria in Santa Monica Bay beach sediments.” Water Research 40(14).

Litton, R.M., Ahn, J.H., Sercu, B., Holden, P.A., Sedlak, D.L., and S.B. Grant, 2010. “Evaluation of Chemical, Molecular, and Traditional Markers of Fecal Contamination in an Effluent Dominated Urban Stream.” Environmental Science and Technology 44(19).

Los Angeles Regional Water Quality Control Board (Regional Board), 2012. Order No. R4-2012-0175 NPDES Permit No. CAS004001 Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, except those Discharges Originating from the City of Long Beach MS4. November 8.

http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/la_ms4/2012/Order%20R4-2012-0175%20-%20A%20Final%20Order%20revised.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2012. Regional Board Basin Plan Amendment for the Santa Monica Bay Beaches Bacteria TMDL. June 7, 2012. http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/90_New/Jan2013/Final%20BPA%20Attach%20A%20SMBB%20Dry&Wet%2007Jun12.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2010. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region for the Santa Monica Bay Nearshore and Offshore Debris TMDL. Attachment A to Resolution No. R10-010. Adopted November 4, 2010. http://63.199.216.6/larwqcb_new/bpa/docs/R10-010/R10-010_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Draft Santa Monica Bay Beaches Bacteria TMDL, Revised Staff Report (Dry Weather Only). January 14, 2002. http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/2002-004/02_0114_tmdl%20Dry%20Weather%20Only_web.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 02-004. http://63.199.216.6/larwqcb_new/bpa/docs/2002-004/2002-004_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate Implementation Provisions for the Region's Bacteria Objectives and to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 2002-022. http://63.199.216.6/larwqcb_new/bpa/docs/2002-022/2002-022_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 1995. Updated 2011. Water Quality Control Plan, Los Angeles Region. http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/index.shtml

Phillips, M.C., Solo-Gabriele, H.M., Piggot, A.M., Klaus, J.S., and Y. Zhang, 2011. "Relationships between Sand and Water Quality at Recreational Beaches", Water Resources 45(20).

Sabino, R., Verissimo, C., Cunha, M.A., Wergikowski, B., Ferreira, F.C., Rodrigues, R., Parada, H., Falcao, L., Rosado, L., Pinheiro, C., Paixao, E., and J. Brandao, 2011. "Pathogenic fungi: An unacknowledged risk at coastal resorts? New insights on microbiological sand quality in Portugal." Marine Pollution Bulletin 62: 1506-1511.

Santa Monica Bay Beaches Bacterial TMDL Jurisdiction Group 7, 2008. "Santa Monica Bay Beaches Bacterial TMDL Jurisdiction 7 Investigation Report". May 21.

State Water Resources Control Board, 2004. "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List". September. http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf

Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. "Sources, Patterns and Mechanisms of Storm Water Pollutant Loading From Watersheds and Land Uses of the Greater Los Angeles Area, California, USA." Southern California Research Project (SCCWRP), Technical Report 510, March.

United States Environmental Protection Agency (USEPA), 2012. Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs.

Weisberg, S.B., and D.M. Ferguson, 2009. "North Santa Monica Bay Source Investigation Study, Ramirez Creek and Escondido Creek, Malibu, 2009 Summary and Recommended Studies." SCCWRP.

References

Weston Solutions, 2010. “Tecolote Creek Microbial Source Tracking Summary – Phases I, II, and III.”

Attachment A

Santa Monica Bay Shoreline Monitoring Data within SMB JG7 WMP Group Area

Table A1 – Average, Median, Minimum, and Maximum of Results for Santa Monica Bay Shoreline Monitoring Data (SMB JG7 WMP Group Area). Years defined as November 1 – October 31.

Analyte	Event Type	Station	Average (MPN/100ml)						Median (MPN/100ml)						Min (MPN/100ml)						Max (MPN/100ml)					
			2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Total Coliform	Dry-Summer	SMB 7-6	83	34.2	43	28	102	95	12	18	31	18	36	59	1	3	3	1	1	4	950	140	240	120	1400	340
Total Coliform	Dry-Winter		21	391	29	131	91	39	8.5	31	16	20	34	18	3	1	1	4	5	8	160	3600	78	570	540	120
Total Coliform	Wet		102	352	244	173	796	94	98	230	73	71	90	66	4	18	4	4	4	12	240	1000	1600	800	8000	310
Fecal Coliform	Dry-Summer		25	9.6	9.3	12	41	14	2.5	3.5	4	5.5	9	6	1	1	1	1	1	1	580	50	56	72	580	110
Fecal Coliform	Dry-Winter		9.9	34	13	101	52	16	2	8.5	3.5	7	16	8	1	1	1	1	1	4	100	250	78	480	470	62
Fecal Coliform	Wet		11	27	21	24	43	35	6.5	32	5	13	11	8	1	5	1	3	1	1	44	40	100	78	260	160
Enterococcus	Dry-Summer		25	12	16	17	17	11	2	3	4	7.5	4	4	1	1	1	1	1	1	360	78	260	90	120	160
Enterococcus	Dry-Winter		11	197	39	158	35	13	4	16	14	7.5	10	4	1	1	1	1	1	1	44	2600	140	1700	190	62
Enterococcus	Wet		119	76	82	99	142	6.8	46	69	24	14	42	6	1	12	1	1	1	3	560	170	270	1000	1200	16
Total Coliform	Dry-Summer	SMB 7-7	31	404	-	24	-	-	8.5	5	-	24	-	-	1	1	-	24	-	-	200	7800	-	24	-	-
Total Coliform	Dry-Winter		49	37	-	-	-	-	16	9	8.5	-	-	-	1	1	1	-	-	-	440	440	16000	-	-	-
Total Coliform	Wet		157	257	-	24	-	-	68	90	24	-	-	-	41	1	-	24	-	-	420	1100	-	24	-	-
Fecal Coliform	Dry-Summer		7.4	159	-	24	-	-	1	1	-	24	-	-	1	1	-	24	-	-	68	4200	-	24	-	-
Fecal Coliform	Dry-Winter		20	8.4	-	-	-	-	1	2	6	-	-	-	1	1	1	-	-	-	230	86	7400	-	-	-
Fecal Coliform	Wet		21	40	-	24	-	-	20	34	24	-	-	-	2	1	-	24	-	-	35	150	-	24	-	-
Enterococcus	Dry-Summer		11	255	-	24	-	-	5	1		24	-	-	1	1	-	24	-	-	88	6200	-	24	-	-
Enterococcus	Dry-Winter		26	29	-	-	-	-	7	5	9	-	-	-	1	1	1	-	-	-	160	260	2200	-	-	-
Enterococcus	Wet		136	209	-	24	-	-	46	74	24	-	-	-	1	7	24	-	-	-	660	740	24	-	-	-
Total Coliform	Dry-Summer	SMB 7-8	53	23	12	47	461	46	9	4	6.5	10	18	12	1	1	1	1	1	1	1200	200	73	200	8800	600
Total Coliform	Dry-Winter		23	60	11	1210	103	98	16	12	8	35	14	27	1	1	1	1	1	1	120	600	36	13000	1000	410
Total Coliform	Wet		73	126	59	230	96	193	55	82	36	116	55	28	1	18	1	1	3	8	200	290	200	1200	200	690
Fecal Coliform	Dry-Summer		4.8	3.1	1.8	5.1	35	6.6	1	1	1	1	4	1	1	1	1	1	1	1	30	27	5	33	660	74
Fecal Coliform	Dry-Winter		6.8	16	1.8	2.4	3.0	2.8	4	1	1	1	2	1	1	1	1	1	1	1	20	170	4	8	8	15
Fecal Coliform	Wet		4.6	17	6.9	25	14	10	5	11	3	4.5	4	3	1	4	1	1	1	1	9	46	36	200	100	50

Analyte	Event Type	Station	Average (MPN/100ml)						Median (MPN/100ml)						Min (MPN/100ml)						Max (MPN/100ml)					
			2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Enterococcus	Dry-Summer		5.0	5.2	2.9	6.7	33	2.0	1	1	1	1	1	1	1	1	1	1	1	1	44	62	19	97	780	19
Enterococcus	Dry-Winter		7.9	38	4.0	21	3.3	2.2	3	4	1	3	1	1	1	1	1	1	1	1	54	540	17	180	13	11
Enterococcus	Wet		23	44	20	117	35	11	9.5	31	8	12	5.5	1.5	1	4	1	1	1	1	70	120	100	1100	280	49
Total Coliform	Dry-Summer	SMB 7-9	49	17	18	24	35	12	12	10	8	16	18	6	1	1	1	1	3	1	480	100	180	130	320	47
Total Coliform	Dry-Winter		28	46	26	252	16	12	18	20	13	31	5	5	1	1	1	1	3	1	130	200	180	1800	85	56
Total Coliform	Wet		142	82	1066	595	105	38	36	38	40	46	19	14	4	20	4	1	16	4	900	220	12000	3400	700	140
Fecal Coliform	Dry-Summer		36	6	7.5	14	18	5.7	7	3.5	4	8	7.5	3	1	1	1	1	1	1	500	26	55	66	200	33
Fecal Coliform	Dry-Winter		26	23	12	85	14	7.2	17	11	3	7	5	4	1	1	1	1	1	1	160	130	100	640	93	40
Fecal Coliform	Wet		43	13	14	61	18	6.4	19	17	5	21	15	4	1	5	1	1	2	1	700	46	180	1500	110	23
Enterococcus	Dry-Summer		7.6	8.1	6.6	36	3.6	3.1	3	3	3	2	2	1	1	1	1	1	1	1	51	60	42	820	21	23
Enterococcus	Dry-Winter		12	35	16.8	48.2	3.7	3.5	5	17	2	5	4	1	1	1	1	1	1	1	44	320	160	400	9	23
Enterococcus	Wet		387	25	112.2	91.2	10.4	5.8	45	12	10	14	7	1	1	5	1	1	1	1	2800	82	1100	820	34	29

Attachment B

Legal Documentation of Authority

1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939
WWW.LACITYSAN.ORG

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

COUNTY OF LOS ANGELES
OFFICE OF THE COUNTY COUNSEL
648 KENNETH HAHN HALL OF ADMINISTRATION
500 WEST TEMPLE STREET
LOS ANGELES, CALIFORNIA 90012-2713

JOHN F. KRATTLI
County Counsel

TELEPHONE
(213) 974-1923
FACSIMILE
(213) 687-7337
TDD
(213) 633-0901

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

<u>Order Part VI(A)(2)(b)(ii)</u>

"*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 A. Fries
JUDITH A. FRIES
Principal Deputy County Counsel
Public Works Division

JAF:jyj

Response to Comments on J7 WMP

Number	WMP Reference	LA County MS4 Permit Provision	Summary of Comments and Necessary Revisions	Final Response
1	Section 2.1.4 pp 11	Parts VI.C.5.a.i Water Quality Characterization	[1] The geographical scope of this WMP is the City of Los Angeles' land area and the LACFCD's infrastructure within Santa Monica Bay (SMB) Jurisdictional Group 7 (JG7) subwatershed. It appears that there are 4 shoreline monitoring locations (SMB 7-06 though SMB 7-09) adjacent to the City's area within SMB JG7, which includes Point Fermin Park Beach. Point Fermin Park Beach should be included in the bulleted list in Section 2.1. [2] The WMP needs to include and evaluate the monitoring data from sampling location SMB 7-7 prior to the landslide in 2009, which is the only point zero sampling point, and the geometric mean data for all sampling locations. [3] In addition, the WMP needs to analyze all available Bight data, in order to determine if there were exceedances of receiving water limitations besides PCBs and DDTs, Basin Plan objectives or the Screening Levels as listed in Attachment G of the LA MS4 Permit.	[1] The original EWMP/WMP boundary (obtained from the RB in 2013) was adjacent to only three SMB monitoring locations (SMB 7-06, 7-07, and 7-08) and did not include SMB 7-09. However, RB memo titled "Changes to Subwatershed Boundaries, Land Area by Owner, Jurisdictional Group Affiliations and Land Use Data in the Santa Monica Bay Beaches Bacteria TMDL" dated January 20, 2004 illustrates changes to the jurisdictional group affiliations that now include Point Fermin and SMB 7-9. As such, SMB 7-9 has been added to the monitoring data analysis and summary, and revisions have been made to the maps and text. Point Fermin Park Beach was added to the to the bulleted list in Section 2.1 [2] Summary of data from SMB 7-7 prior to the landslide has been added. [3] See response to comment #4 below.
2	Section 2.2 pp 15	Parts VI.C.5.a.ii(1) and iv(1) Water Body-Pollutant Classification	For completeness, the WMP could address the 303(d) listing of Fish Consumption Advisory as a footnote to Table 2-8 associated with the pollutants, DDTs and PCBs.	The 303(d) listing has been added as a footnote to Table 2-9.
3	Section 2.1.4 pp 11	Part VI.C.5.a.ii(2) and iv(2) Water Body-Pollutant Classification	[1] The WMP needs to include a discussion of why sediment toxicity is not included as a Category 2 WBPC. The City and LACFCD could cite USEPA's recommendation that SMB not be identified as impaired by sediment toxicity in the next 303(d) List and provide data to support delisting. [2] In addition, in Section 2.1.5, the WMP needs to discuss what data was evaluated and how the Permittees evaluated the available water quality data for water body-pollutant combinations that would fall into Category 2. It is assumed that the same Bight data that was evaluated for Category 3 pollutants could be used to evaluate whether there are exceedances of any pollutant that would meet the State's listing criteria.	[1] Language was added and now references USEPA's recommendation (with respect to the PCB and DDT TMDL) stating that sediment toxicity not be included as Category 2 [2] Per response to comment #4 below, the Bight data is not necessarilydirectly linked to MS4 discharges. Justifications to why the the evaluated Bight data was not sufficent to 303(d) list any WBPCs was included.
4	Section 2.1.6 pp. 14	Part VI.C.5.a.ii(3) and iv(2) Water Body-Pollutant Classification	The draft WMP states, "The only TMDL sediment-based targets applicable to the SMB JG7 WMP area are for DDTs and PCBs; therefore, DDTs and PCBs are the only analytes included in this analysis." However, the purpose of the water quality characterization is to identify other potential pollutants of concern, not just those that are already being addressed. The sediment data from 2003 and 2008 should be further evaluated to identify if there are other sediment bound pollutants at concentrations of concern in the area offshore from the SMB JG7 WMP area.	Bight data from 2003 and 2008 were reviewed and determined not to meet the requirements of the 303(d) listing policy, which isspecifically intended to address water body impairments. Additionally, the offshore sediment data in this area are not representative of MS4 discharges,the effect of which is exacerbated given the sample proximities to the Palos Verdes Shelf Superfund Site.
5	Section 2.3 pp 17	Part VI.C.5.a.iii Source Assessment	The WMP needs to include a source assessment regarding known and suspected storm water and non-storm water pollutant sources in discharges to the MS4 and from the MS4 to receiving waters. The source assessment should include (1) a discussion of findings from implementation of the minimum control measures under the 2001 Permit; (2) a discussion of the data and conclusions from the TMDL source investigations; and (3) known or suspected sources of storm water and non-storm water pollutants, which may cause or contribute to the water quality exceedances which have been observed at the shoreline monitoring sites.	More detail has been added to source assessment (1) TMDL staff report source assesment to be referenced, and (2) other data, though limited information is available.
6	Figure 2-1 pp. 12	Part VI.C.5.a.iii.(1)(b) Source Assessment	The WMP needs to identify on a map the City's and LACFCD's catch basins and major outfalls. Regional Water Board staff is aware that the CIMP (Figure 3, Table 12 and Attachment C) identifies outfalls to SMB. However, the WMP should include this information as well.	Catch basins and City/County-owned outfalls have been added to WMP figures, consistent with those figures in the CIMP.
7	Section 4 pp 29 & 30	Part VI.C.5.a.iv.(1) Prioritization	[1] Section 4.1, page 28 of the draft WMP reports to be in compliance with the SMB bacteria TMDL. However, Table 2-6 clearly shows that the allowable exceedance days have been exceeded. The revised WMP needs to discuss the cause of these exceedances. [2] The City and LACFCD will meet the interim and final WQBELs for trash by retrofitting all catch basins in the City's and LACFCD's area of Santa Monica Bay JG7 with full capture devices. The revised WMP needs to clarify if 218 or 220 catch basins will be retrofitted.	[1] Potential cause of exceedances will be discussed including additional discussion of previous local studies. [2] The number of catch basins to be retrofitted has been updated.

Number	WMP Reference	LA County MS4 Permit Provision	Summary of Comments and Necessary Revisions	Final Response
8	Section 5.3 pp 33	Part VI.C.5.b.ii.(1) Selection of Watershed Control Measures	The WMP needs to specify a strategy that will be implemented to prevent or eliminate non-storm water discharges, if necessary based on the findings of the non-storm water screening program.	Strategy to address non-storm water discharges is included in the CIMP and has been incoporated by reference. Three non-stormwater screenings will take place within one year of CIMP approval.
9	Section 3.1.2 pp 32	Part VI.C.5.b.iv.(4)(b)-(e) Selection of Watershed Control Measures	The draft WMP states that all catch basins will be retrofitted by 2016, ahead of the 2020 compliance deadline; however, the WMP needs to provide a schedule that demonstrates that the required 20% load reduction in debris will be achieved by the interim compliance deadline of March 20, 2016. The revised WMP needs to provide more specificity with regards to the schedule, location and agencies responsible for retrofitting the catch basins with full capture devices throughout the JG7 WMP area.	Additional detail added on catch basin retrofit program, including load reductions, which are anticipated to correspond with the percentage of catch basins retrofitted is provided.
10	Section 4 pp 36	Part VI.C.5.b.iv.(5) Reasonable Assurance Analysis	A reasonable assurance analysis was not performed. As stated in the draft WMP, "For the SMB JG7 WMP, there are currently zero required load reductions for the Category 1 WBPCs: bacteria at the Santa Monica Bay Beaches and PCBs/DDTs in the Santa Monica Bay. Compliance with the Trash TMDL is being demonstrated through retrofitting of catch basins as outlined in the Trash Monitoring and Reporting Program. …Therefore, no quantitative RAA modeling is required for this WMP."	Comment noted.
11	Appendix B	Part VI.C.5.b.iv.(6) Legal Authority	The City and the LACFCD need to provide documentation that they have the legal authority to implement the Watershed Control Measures identified in the WMP, which includes the MCMs.	The City and LACFCD's legal authority to implement the MCMs is referenced in Section III and documented in Attachment B.
12	Section 5.1 pp 38	Part VI.C.5.c Compliance Schedules	The draft WMP did not develop a compliance schedule for the USEPA promulgated SMB TMDLs for DDT and PCBs, as required by the LA County MS4 Permit. Since this TMDL does not have a State- adopted implementation plan and further since the WLAs are based on existing conditions, the compliance deadline is immediate. The JG7 group should ensure that monitoring data are collected to demonstrate compliance with the applicable WQBELs.	The EPA TMDL for PCBs and DDTs does not include a compliance schedule for the WLAs for the Santa Monica Bay WMA. However, to demonstrate compliance with the TMDL, DDTs and PCBs will be assessed by monitoring the sediment fraction at the J7 MS4 outfall monitoring point using a three year averaging period, with the first compliance assessment three years after CIMP implementation. This will be included in the revsied CIMP.

April 2015

SANTA MONICA BAY JG7 WATERSHED MANAGEMENT PLAN GROUP

Coordinated Integrated Monitoring Program (CIMP)

Prepared by

City of Los Angeles and Los Angeles County Flood Control District

The MWH Team

MWH Geosyntec consultants CWE M2 Resource Consulting, Inc.

Table of Contents

List of Figures v

List of Tables v

List of Attachments v

Section 1 Introduction 1

1.1 SANTA MONICA BAY JURISDICTIONAL GROUP 7 WATERSHED MANAGEMENT PLAN AREA 1

1.2 CIMP OVERVIEW 7

1.2.1 Receiving Water Monitoring 7

1.2.2 Stormwater Outfall Monitoring 7

1.2.3 Non-Stormwater Outfall Program 8

1.2.4 New Development and Redevelopment Effectiveness Tracking 8

1.2.5 Regional Studies 8

1.2.6 Special Studies 8

Section 2 Receiving Water Monitoring Program 9

2.1 EXISTING MONITORING PROGRAMS 9

2.1.1 Santa Monica Bay Beaches Bacteria TMDL 12

2.1.2 Santa Monica Bay Nearshore and Offshore Debris TMDL 14

2.1.3 Santa Monica Bay DDTs and PCBs TMDL 16

2.2 CIMP RECEIVING WATER MONITORING SITE 17

2.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION 20

2.3.1 Wet Weather 20

2.3.2 Dry Weather 21

2.4 RECEIVING WATER MONITORING SUMMARY 21

Section 3 MS4 Infrastructure Database 22

Section 4 Stormwater Outfall Monitoring 24

4.1 PROGRAM OBJECTIVES 24

4.2 STORMWATER OUTFALL MONITORING SITES 24

4.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION 25

Section 5 Non-Stormwater Outfall Screening and Monitoring Program 27

5.1 PROGRAM OBJECTIVES 27

5.2 NON-STORMWATER OUTFALL SCREENING AND MONITORING PROGRAM 28

RB-AR16905

5.3 IDENTIFICATION OF OUTFALLS WITH SIGNIFICANT NON-STORMWATER DISCHARGES ... 28
5.4 PRIORITIZED SOURCE IDENTIFICATION ... 30
5.5 SIGNIFICANT NON-STORMWATER DISCHARGE SOURCE IDENTIFICATION ... 30
5.6 NON-STORMWATER DISCHARGE MONITORING ... 32
5.6.1 Monitoring Frequency, Parameters, and Duration ... 32
5.7 NON-STORMWATER OUTFALL PROGRAM SUMMARY ... 33
Section 6 New Development/Re-Development Effectiveness Tracking Program ... 34
6.1 PROGRAM OBJECTIVES ... 35
6.2 EXISTING NEW DEVELOPMENT/RE-DEVELOPMENT TRACKING PROCEDURES ... 35
6.3 SPECIAL CONSIDERATIONS FOR DATA MANAGEMENT AND REPORTING 35
6.3.1 Data Management ... 35
6.3.2 Additional Data ... 36
6.3.3 Reporting ... 37
6.4 SUMMARY OF NEW DEVELOPMENT/RE-DEVELOPMENT EFFECTIVENESS TRACKING ... 40
Section 7 Regional Studies ... 41
Section 8 Special Studies ... 42
Section 9 Non-Direct Measurements ... 43
Section 10 Adaptive Management ... 44
10.1 INTEGRATED MONITORING AND ASSESSMENT PROGRAM ... 44
10.2 CIMP REVISION PROCESS ... 44
Section 11 Reporting ... 46
11.1 DOCUMENTS AND RECORDS ... 46
11.1.1 Semi-Annual Data Submittal ... 46
11.1.2 Annual Monitoring Reports ... 47
11.1.3 Signatory and Certification Requirements ... 47
Section 12 Schedule for CIMP Implementation ... 49
Section 13 References ... 50
Section 1 Analytical Procedures ... 2
1.1 Field Parameters ... 2
1.2 Analytical Methods and Method Detection and Reporting Limits ... 2

RB-AR16906

1.2.1 Method Detection Limit Studies 14
1.2.2 Project Reporting Limits 15
1.2.3 Laboratory Standards and Reagents 15
1.2.4 Sample Containers, Storage, Preservation, and Holding Times 15
1.3 Aquatic Toxicity Testing and Toxicity Identification Evaluations 17
1.3.1 Sensitive Species Selection 17
1.3.1.1 *Freshwater Sensitive Species Selection* 17
1.3.2 Testing Period 19
1.3.3 Toxicity Endpoint Assessment and Toxicity Identification Evaluation Triggers 19
1.3.4 Toxicity Identification Evaluation Approach 20
1.3.5 Follow Up on Toxicity Testing Results 22
1.3.6 Summary of Aquatic Toxicity Monitoring 23
Section 2 Sampling Methods and Sample Handling 25
2.1 Monitoring Event Preparation 25
2.1.1 Bottle Order/Preparation 26
2.1.2 Container Labeling and Sample Identification Scheme 27
2.1.3 Field Meter Calibration 27
2.1.4 Weather Conditions 29
2.2 Sample Handling 30
2.2.1 Documentation Procedures 30
2.2.2 Field Documentation/Field Log 31
2.2.3 Sample Handling and Shipment 31
2.2.4 Chain-of Custody Forms 32
2.2.5 Laboratory Custody Procedures 32
2.3 Field Protocols 33
2.4 Sample Collection 34
2.4.1 Overview of Sampling Techniques 34
2.4.2 Field Measurements and Observations 35
2.4.3 Sampling Techniques for the Collection of Water 37
2.4.4 Receiving Water Sample Collection 40
2.4.5 Stormwater Outfall Sample Collection 40
2.4.6 Non-Stormwater Outfall Screening Surveys and Sample Collection 41
2.4.6.1 *Non-Stormwater Sample Collection* 41

2.4.7 Stormborne Sediment Collection 41
2.4.8 Bioaccumulation Sample Collection 41
2.4.9 Trash Monitoring 41
2.4.10 Plastic Pellet Monitoring 42
2.4.11 Quality Control Sample Collection 42
Section 3 Quality Assurance/Quality Control 43
3.1 QA/QC Requirements and Objectives 44
3.1.1 Comparability 44
3.1.2 Representativeness 44
3.1.3 Completeness 45
3.2 QA/QC Field Procedures 45
3.2.1 Equipment Blanks 45
3.2.2 Field Blanks 45
3.2.3 Field Duplicates 46
3.3 QA/QC Laboratory Analyses 46
3.3.1 Method Blanks 46
3.3.2 Laboratory Duplicates 46
3.3.3 Matrix Spikes and Matrix Spike Duplicates 46
3.3.4 Laboratory Control Samples 47
3.3.5 Surrogate Spikes 47
3.3.6 Toxicity Quality Control 47
Section 4 Instrument/Equipment Calibration and Frequency 48

List of Figures

Figure 1	Geographical Area and Land Uses
Figure 2	Percent Impervious
Figure 3	Municipal Separate Storm Sewer System (MS4)
Figure 4	Existing Monitoring Stations
Figure 5	Industrial Zones in the City of Los Angeles Portion of JG7
Figure 6	CIMP Monitoring Stations

List of Tables

Table 1	Land Use Summary
Table 2	Water Body-Pollutant Priorities
Table 3	Summary of Reconsideration Elements for SMBBB TMDL
Table 4	SMBBB TMDL Water Quality-Based Effluent Limitations and Receiving Water Limitations
Table 5	Annual Allowable Exceedance Days of the Single Sample Objective (days)
Table 6	Santa Monica Bay Debris TMDL Compliance Schedule
Table 7	Santa Monica Bay DDTs and PCBs TMDL Waste Load Allocations
Table 8	Land Use Overview of Outfall Nearest to Receiving Water Monitoring Site SMBJ7-RW-1
Table 9	Receiving Water Monitoring Parameters and Annual Frequency
Table 10	GIS Data Sources
Table 11	Land Use Overview of Potential Outfall Monitoring Sites
Table 12	Stormwater Outfall Monitoring Parameters and Annual Frequency
Table 13	Non-Stormwater Screening Sites in SMB JG7 WMP Group Area
Table 14	Source Identification Types
Table 15	Non-stormwater Outfall Monitoring Parameters and Annual Frequency (Year 1)
Table 16	Development Review Process and Data Collection
Table 17	Example Data Collection Template

List of Attachments

Attachment A	LACFCD Background Information
Attachment B	Analytical and Monitoring Procedures
Attachment C	Outfall Investigation Photographic Log
Attachment D	Example Calibration, Field and Chain-of-Custody Forms

LIST OF ACRONYMS

Acronym	Definition
40 CFR	Code of Federal Regulations
AED	Allowable Exceedance Day
AIN	Assessor's Identification Number
ASBS	Areas of Special Biological Significance
ASTM	American Society for Testing and Materials
Basin Plan	Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CCW	Calleguas Creek Watershed
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIMP	Coordinated Integrated Monitoring Program
County	Los Angeles County
COC	Chain of Custody
CRM	Certified/ Standard Reference Material
CSMP	Coordinated Shoreline Monitoring Plan
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CWC	California Water Code
DAP	Discharge Assessment Plan
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
EDTA	Ethylene Diamine Tetra Acetic Acid
EIA	Effective Impervious Area
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ES	Executive Summary
EWMP	Enhanced Watershed Management Program
FLPE	Fluorinated high-density polyethylene
GIS	Geographic Information System
GM	Geometric Mean
GWQC	General Water Quality Constituents
HUC	Hydrologic Unit Codes
IC/ID	Illicit Connection/Illicit Discharge
IMCR	Integrated Monitoring Compliance Report
IMP	Integrated Monitoring Program

IWC	In-stream waste concentration
JG	Jurisdictional Group
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LCS	Laboratory Control Sample/Standard
LID	Low Impact Development
MAL	Municipal Action Limits
MBAS	Methylene Blue Active Substances
MCM	Minimum Control Measure
MDL	Method Detection Limit
MES	Mass Emission Stations
MF	Multi-Family
MGD	Million Gallons per Day
MPN	Most Probable Number
MRP	Monitoring and Report Program
MS4	Municipal Separate Storm Sewer System
MTBE	Methyl tert-butyl ether
NA	Not Applicable
NELAP	National Environmental Laboratory Accreditation Program
NIST	National Institute for Standards and Technology
NPDES	National Pollutant Discharge Elimination System
NSW	Non-Stormwater
NTU	Nephelometric Turbidity Units
OC	Organochlorine
OP	Organophosphate
PBO	Piperonyl Butoxide
PCB	Polychlorinated biphenyl
PDF	Portable Document Format
PE	Polyethylene
Permit	Permit No. R4-2012-0175
PMRP	Pellets Monitoring and Reporting Plan
PRM	Pathogen Related Mortality
QA	Quality Assurance
QC	Quality Control
QPF	Quantitative Precipitation Forecast
RAA	Reasonable Assurance Analysis
REC-1/REC-2	Recreational Beneficial Use Designations
Regional Board	Los Angeles Regional Water Quality Control Board
RL	Reporting Limits
RPD	Relative Percent Difference
RW	Receiving Water

RWL	Receiving Water Limitations
RWQCB	Regional Water Quality Control Board
SCCWRP	Southern California Coastal Water Research Project
SDTF	Standardized Data Transfer Format
SF	Single Family
SIC	Standard Industrial Classification System
SM	Standard Methods
SMB	Santa Monica Bay
SMB JG7 WMP Group	Santa Monica Bay Enhanced Watershed Management Program Group
SMBBB	Santa Monica Bay Beaches Bacteria
SMC	Southern California Stormwater Monitoring Coalition
SMURRF	Santa Monica Urban Runoff Recycling Facility
SOP	Standard Operating Procedure
SPE	Solid Phase Extraction
SQO	Sediment Quality Objectives
SSC	Suspended Sediment Concentration
STS	Sodium thiosulfate
SVOC	Semi Volatile Organic Compound
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TKN	Total Kjehdahl Nitrogen
TM	Technical Memo
TMDL	Total Maximum Daily Load
TMRP	Trash Monitoring and Reporting Plan
TOC	Total Organic Carbon
TRE	Toxicity Reduction Evaluation
TSS	Total Suspended Solids
TST	Test of Significant Toxicity
UC	University of California
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WBPCs	Water Body-Pollutant Combinations
WDID	State Waste Discharge Identification
WLA	Waste Load Allocations
WMA	Watershed Management Area
WMP	Watershed Management Program
WQBEL	Water Quality-Based Effluent Limits

Section 1
Introduction

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) has been a participating agency of Jurisdictional Group 7 (JG7) of the Santa Monica Bay (SMB) Watershed since the adoption of the Santa Monica Bay Beaches Bacteria Total Maximum Daily Loads (TMDLs) in 2003. However, the City of Los Angeles and the other MS4 permittees in JG7 could not reach an agreement for a collaborative approach to satisfying the requirements of the MS4 permit. Therefore, on November 26, 2013 the Regional Board requested that the City and the Los Angeles County Flood Control District (LACFCD) (see **Attachment A** for background on the LACFCD), collectively referred to as the SMB JG7 WMP Group, pursue a WMP instead of an EWMP to fulfill the requirements of the MS4 Permit. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural BMP implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). As such, in December of 2013 the JG7 SMB WMP Group submitted a revised notice of intent to develop a WMP for the City of Los Angeles land area within JG7 of the Santa Monica Bay Watershed.

This Coordinated Integrated Monitoring Program (CIMP) fulfills the requirements presented in the Monitoring and Reporting Program (MRP) portion of the Permit, which are specified in Attachment E of the Permit. The primary objectives for the MRP are listed in Part II.A of the MRP, as follows:

- Assess the chemical, physical, and biological impacts of discharges from the MS4 on receiving waters;
- Assess compliance with RWLs and WQBELs established to implement Total Maximum Daily Load (TMDL) wet-weather and dry-weather waste load allocations (WLAs);
- Characterize pollutant loads in MS4 discharges;
- Identify sources of pollutants in MS4 discharges; and
- Measure and improve the effectiveness of pollutant controls implemented under the Permit.

Additionally, the CIMP incorporates TMDL monitoring requirements to unify monitoring efforts and to provide consistent observations of watershed conditions.

1.1 SANTA MONICA BAY JURISDICTIONAL GROUP 7 WATERSHED MANAGEMENT PLAN AREA

Santa Monica Bay is an integral part of the larger geographic region commonly known as the Southern California Bight (or, bend in the coastline). It is bordered offshore by the Santa Monica Basin, to the north by the rocky headlands of Point Dume, and to the south by the Palos Verdes Peninsula, and onshore by the Los Angeles Coastal Plain and Santa Monica Mountains. The 264,960 acres of land that drains naturally to Santa Monica Bay is bordered on the north by the Santa Monica Mountains from the Ventura-

Los Angeles County line (to the west) to Griffith Park (to the east), extending south and west across the Los Angeles Coastal Plain to include the area east of Ballona Creek and north of Baldwin Hills. South of Ballona Creek, a narrow coastal strip between Playa del Rey and the Palos Verdes Peninsula forms the southern boundary of the watershed. The Santa Monica Bay itself is the submerged portion of the Los Angeles Coastal Plain. The continental shelf extends seaward to the shelf break about 265 feet underwater, then drops steeply to the Santa Monica Basin at about 2,630 feet underwater.

Nearshore Santa Monica Bay is defined by the Ocean Plan as a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot contour, whichever is further from the shoreline. Offshore is defined as the waters between the near shore zone and the limit of State Waters. Lastly, State Waters, according to Section 13200 of the California Water Code (CWC), extends three nautical miles into the Pacific Ocean from the line of mean lower low water marking the seaward limits of inland waters and three nautical miles from the line of mean lower low water on the mainland and each offshore island.

The SMB JG7 WMP Group area lies within the larger JG7 boundary in the southern portion of the Santa Monica Bay watershed. The JG7 WMP area includes that portion of the area within the Hydrologic Unit Codes (HUC-12): Manhattan Beach – Frontal Santa Monica Bay which extends along the shoreline from Cabrillo Beach up to the Ocean Trails Reserve.

The SMB JG7 WMP Group area is bordered on the north approximately by the Bogdanovich Recreation Center and W 25th street and the south by Royal Palms Beach, White Point Beach, the southern point of Cabrillo Beach, and other shoreline that drains to the Santa Monica Bay. This area is bordered on the west by the City of Ranchos Palos Verdes and on the east by Cabrillo Beach. The SMB JG7 WMP Group area is solely under the jurisdiction of the City of Los Angeles and includes all of the White Point Natural Preserve and Education Center as well as Point Fermin Park.

The SMB JG7 WMP Group is comprised of two participating agencies: the City of Los Angeles and LACFCD. The SMB JG7 WMP Group area, which consists solely of JG7 area under the jurisdiction of the City, totals approximately 1,056 acres, which is approximately 9% of the entire JG7 area within the Santa Monica Bay Watershed (**Figure 1**). The geographical scope of the SMB JG7 WMP Group area includes land owned by the Los Angeles Air Force Base Pacific Crest Housing Area, which the MS4 Permittees have no jurisdiction over and thus is excluded from the SMB JG7 WMP Group Area. Excluding these areas, the WMP Group area covers approximately 1,056 acres. Approximate land area and land use summaries for the JG7 WMP Group area are listed in **Table 1** and presented in **Figure 1**. The most prevalent land uses are residential (67%) and open space (27%). The open space area includes 102 acres of restored coastal sage scrub habitat and hiking trails located within the White Point Nature Preserve Wild Park as well as portions of Point Fermin Park. The remaining area consists of a mixture of commercial, education, and industrial land uses. **Figure 2** illustrates the distribution of percent imperviousness across the JG7 WMP Group area.

Table 1
Land Use Summary

Land Use	SMB JG7 WMP Group	
	Acres	% of Total
Agriculture	0.0	0.0%
Commercial	25.5	2.4%
Industrial	1.0	0.09%
Education	32.2	3.1%
Multi-Family Residential	151.0	14.3%
Single Family Residential	561.5	53.2%
Vacant/Open	284.3	26.9%
Transportation	0.0	0.0%
Total	1056	100%

Figure 3 depicts the MS4 system in the JG7 WMP Group area, including outfalls, approximate catchment delineations, and storm drain diameters. Attachment A of the MS4 Permit defines a major MS4 outfall (or ‘‘major outfall’’) as a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive stormwater from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more) (40 CFR § 122.26(b)(5)).

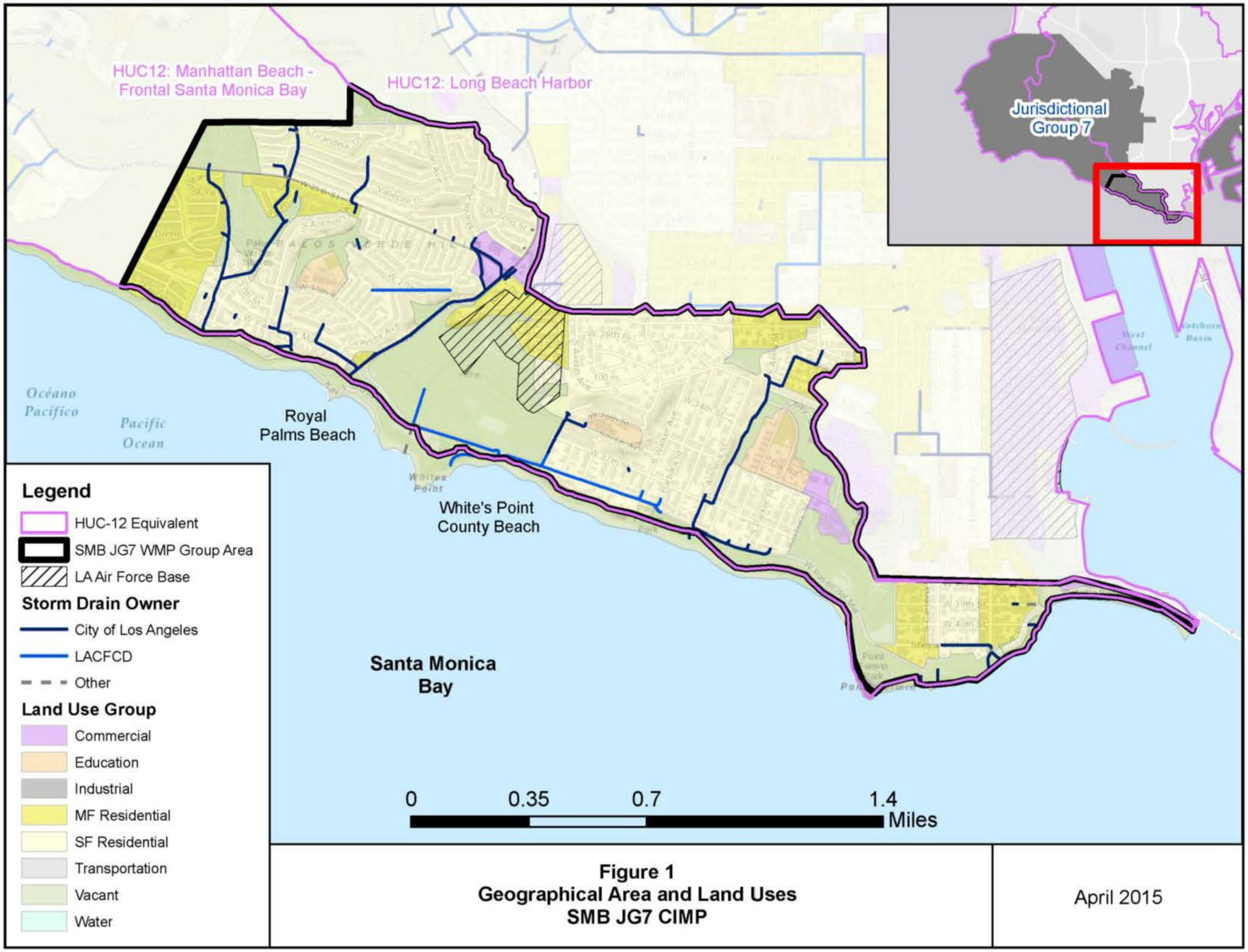


Figure 1
Geographical Area and Land Uses
SMB JG7 CIMP

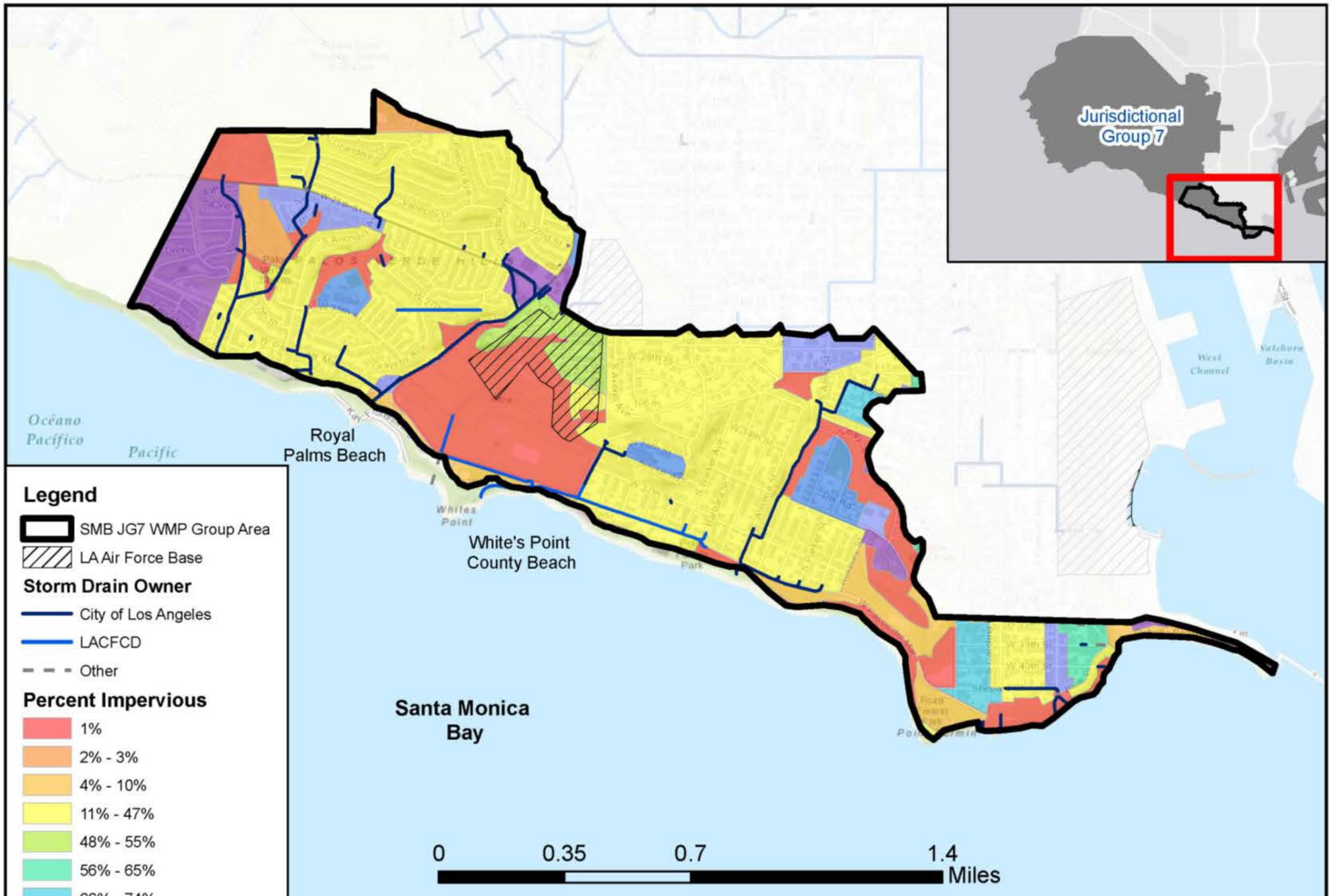


Figure 2
Percent Impervious
SMB JG7 CIMP

April 2015

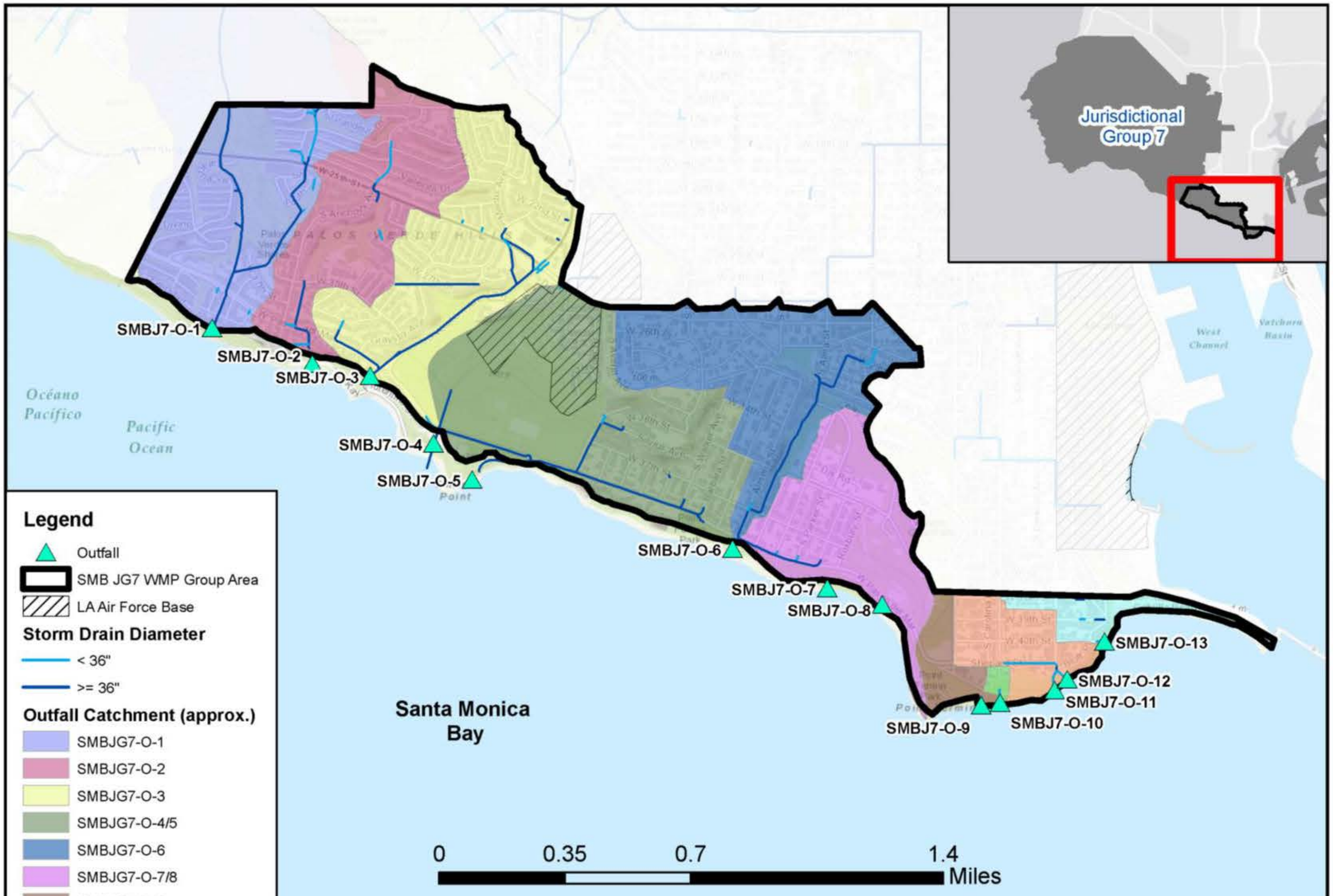


Figure 3
Municipal Separate Storm Sewer System (MS4)
SMB JG7 CIMP

April 2015

RB-AR16918

The receiving waters defined by the Water Quality Control Plan, Los Angeles Region (Basin Plan) (Regional Board, 1995, Updated 2011) within the SMB JG7 WMP Group area include:

- Santa Monica Bay – Offshore/Nearshore Zone
- Royal Palms Beach
- White's Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

Attachment B of the MS4 Permit shows mapped United States Geological Survey Hydrologic Units, and other features, based on HUC-12 watershed boundaries. In lieu of these specified boundaries, the March 26, 2014 Regional Board Reasonable Assurance Analysis (RAA) Guidelines allows WMP groups to use HUC-12 equivalent watersheds, prepared by the LACFCD. Using the LACFCD HUC-12 layer and numbering conventions, the LACFCD HUC-12 boundary relevant to the SMB JG7 WMP Group is Manhattan Beach – Frontal Santa Monica Bay (180701040500).

1.2 CIMP OVERVIEW

The CIMP is designed to provide the information necessary to guide management decisions in addition to providing a means to measure compliance with the Permit. The SMB JG7 WMP Group's CIMP addresses the six required elements of the Permit MRP:

1. Receiving Water Monitoring
2. Stormwater Outfall Monitoring
3. Non-Stormwater Outfall Monitoring
4. New Development and Redevelopment Effectiveness Tracking
5. Regional Studies
6. Special Studies

Each of the six CIMP elements is summarized below.

1.2.1 Receiving Water Monitoring

Receiving water monitoring is intended to assess whether water quality objectives are being achieved, to determine if beneficial uses are being supported, and to track trends in constituent concentrations over time. The data from the Peninsula Cities CIMP will be used, with one alternate receiving water monitoring site within the J7 CIMP area if the Peninsula data is not available. **Section 2** discusses the SMB JG7 WMP Group's receiving water monitoring program.

1.2.2 Stormwater Outfall Monitoring

Stormwater outfall monitoring assesses compliance with municipal action limits (MALs), WQBELs derived from TMDL WLAs, and evaluates whether discharges have the potential to have caused or contributed exceedances of RWLs derived from TMDL WLAs or receiving water quality objectives.

The majority of storm drains within the SMB JG7 WMP Group generally drain towards Santa Monica Bay. Data from stormwater outfall monitoring for the Peninsula Cities CIMP will be used to represent stormwater quality from the J7 WMP area. If data from the Peninsula Cities is unavailable, data from stormwater outfall monitoring from Santa Monica Bay J2/J3 will be used to represent stormwater quality from the J7 WMP area. Alternatively, if data from the adjacent CIMPs are not available or deemed not representative, one primary alternate and another secondary

RB-AR16919

alternate outfall monitoring site within the J7 CIMP area will be monitored. A synopsis of the outfall drainage area, along with an analysis of its land use/zoning characteristics is summarized in **Section 4**.

1.2.3 Non-Stormwater Outfall Program

To fulfill the Permit requirements, the MRP requires Permittees to implement a Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) which is focused on eliminating non-permitted non-stormwater discharges to receiving waters. Additional details of the Non-Stormwater Program are presented in **Section 5**.

1.2.4 New Development and Redevelopment Effectiveness Tracking

The New Development/Re-Development Effectiveness Tracking is required to identify the information necessary for data management and annual compliance reporting. The SMB JG7 WMP Group will maintain an informational database record for each new development/re-development project subject to the minimum control measure (MCM) and their adopted Low Impact Development (LID) Ordinance. In addition, the SMB JG7 WMP Group will implement a tracking system for new development/re-development projects that have been conditioned for post-construction BMPs. **Section 6** presents the new development and redevelopment effectiveness tracking system for the SMB JG7 WMP Group.

1.2.5 Regional Studies

The MRP identifies one regional study: the SMC Regional Watershed Monitoring Program. None of the SMC monitoring sites are located within the SMB JG7 WMP Group area due to a lack of streams or rivers.

1.2.6 Special Studies

The MRP requires each Permittee to be responsible for conducting special studies required in an effective TMDL or an approved TMDL Monitoring Plan. Special studies options are further discussed in **Section 8**.

Section 2
Receiving Water Monitoring Program

Receiving water bodies within the SMB JG7 WMP Group area were presented in Section 1. The receiving water bodies (Santa Monica Bay – Offshore/Nearshore zone, Royal Palms Beach, White Point Beach, and Point Fermin Park Beach) are designated as having existing recreational beneficial uses (REC-1 and REC-2), among others. The objectives of the CIMP receiving water monitoring program include the following (Part II.E.1 of the MRP):

- Determine whether the receiving water limitations are being achieved;
- Assess trends in pollutant concentrations over time, or during specified conditions; and
- Determine whether the designated beneficial uses are fully supported as determined by water chemistry, as well as aquatic toxicity and bioassessment monitoring.

The requirements in the MRP for selecting receiving water monitoring sites include utilizing receiving water monitoring sites at previously designated LACDPW mass emission (ME) stations, TMDL receiving water compliance points, and additional receiving water locations representative of the impacts from MS4 discharges. Through the evaluation of previously-utilized and existing receiving water monitoring sites, no existing ME stations were located. As shown in **Figure 4**, three existing Santa Monica Bay Beaches Bacteria TMDL monitoring stations are located within the SMB JG7 WMP Group's jurisdictional area (SMB 7-06, SMB-7-08, and SMB 7-09; SMB 7-07 was destroyed in a landslide). SMB J7 WMP Group is uniquely different from other SMB subwatersheds and watershed groups in that the storm drain outfalls are located along steep bluffs and cliffs up to a hundred feet high or more without safe access to the shoreline. The path to shoreline locations associated with outfalls are often either non-existent or through an unsafe rocky cliff. The City of Los Angeles has assessed all potential replacement outfalls between SMB 7-06 and SMB 7-08, in addition to local receiving water locations, in an attempt to designate a representative replacement additional shoreline monitoring location. However, all potential locations were found to be unsafe for sampling. Details of the outfalls reviewed are included in Attachment C. Additionally, four sites in the Santa Monica Bay offshore of the JG7 WMP Group area are monitored as part of the Bight Program. Existing monitoring programs are discussed in Section 2.1 below.

One receiving water station was identified for monitoring as part of the CIMP in the event that data from the Peninsula Cities CIMP is unavailable. Details on the monitoring site selection as well as the proposed frequency, parameters, and duration of monitoring are discussed in Section 2.2 through 2.4.

2.1 EXISTING MONITORING PROGRAMS

A regional monitoring program to assess the health of the Southern California Bight has been coordinated through Southern California Coastal Water Research Project (SCCWRP) at five-year intervals including 1994, 1998, 2003, 2008, and 2013. The Bight Regional Monitoring programs include:

- Coastal Ecology
- Shoreline Microbiology
- Offshore Water Quality
- Rocky Reef
- Areas of Special Biological Significance (ASBS)
- Coastal Wetlands and Estuaries

Through these programs, the SCCWRP has been able to conduct a regional assessment of the cumulative impacts from multiple sources. Bight sampling locations are shown in **Figure 4**. The monitoring sites were analyzed for trace metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), poly brominated diphenyl ethers (PBDEs), chlorinated hydrocarbons, total organic carbon (TOC), nitrogen, phosphorus, and grain size.

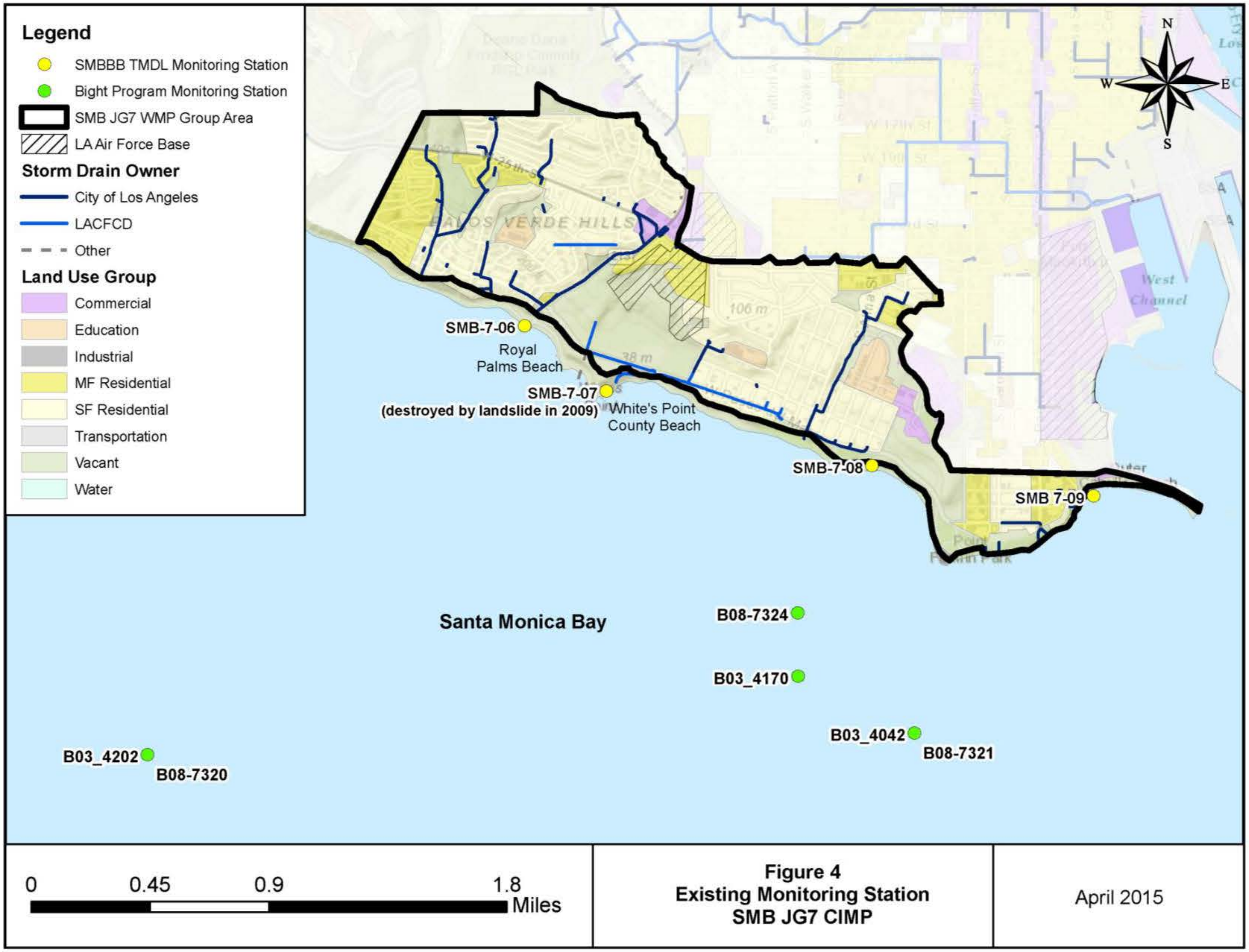


Figure 4
Existing Monitoring Station
SMB JG7 CIMP

April 2015

RB-AR16923

The TMDLs addressing water body-pollutant combinations within or downstream of the SMB JG7 WMP Group include:

- Santa Monica Bay Beaches Bacteria TMDL (Wet and Dry), July 15, 2003 (SMBBB TMDL);
- Santa Monica Bay TMDL for Dichlorodiphenyltrichloroethanes (DDTs) and Polychlorinated biphenyls (PCBs), March 26, 2012 (SMB DDT and PCB TMDL); and
- Santa Monica Bay Nearshore and Offshore Debris TMDL, March 20, 2012 (SMB Debris TMDL).

The water body-pollutant priorities are summarized in **Table 2**, as described in detail in the SMB JG7 WMP. Compliance deadlines associated with each of the TMDLs listed above are also presented in **Table 2**. All SMB JG7 WMP water body-pollutant combinations fall within Category 1, highest priority. No Category 2 or 3 water body-pollutant combinations were identified.

Table 2
Water Body-Pollutant Priorities

Category	Water Body	Pollutant	Compliance Deadline
1: Highest Priority (Approved TMDL)	SMB Beaches	Summer dry weather bacteria	7/15/2006 (Single sample)
		Winter dry weather bacteria	7/15/2009 (Single sample)
		Wet weather bacteria	7/15/2013 (Single sample)[1]
			7/15/2013 (Geometric mean)[1, 2]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][3]
		PCBs	[No compliance deadline specified in TMDL][3]

[1] Per Resolution 2006-008, the JG7 agencies elected to pursue a non-integrated water resources approach to SMBBB TMDL compliance, which resulted in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf
[2] The rolling 30-day geometric mean will be calculated weekly based on calculation of a rolling six week geometric mean using five or more samples, starting all calculation weeks on Sunday.
[3] Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, WLA target was set at existing waste load, so antidegradation conditions exist.

2.1.1 Santa Monica Bay Beaches Bacteria TMDL

The Santa Monica Bay beaches were designated as impaired and included on California's 1998 Clean Water Act (CWA) §303(d) list of impaired waters due to excessive amounts of coliform bacteria. The presence of coliform bacteria in surface waters is an indicator that water quality may not be sufficient to maintain the beneficial use of these waters for human body contact recreation (REC-1). In 2003, the USEPA approved the SMBBB TMDL for dry- and wet-weather conditions, the first bacteria TMDL adopted by the Regional Board in the State of California. To comply with the requirements of the TMDL, the Jurisdictional Groups developed a Coordinated Shoreline Monitoring Plan (CSMP) and began monitoring compliance sites on November 1, 2004 subsequent to Regional Board approval.

As this was the first bacteria TMDL, new approaches for regulating bacteria were developed. The SMBBB TMDL used these new approaches, including the reference beach/antidegradation approach and the corresponding exceedance day approach to expressing TMDL allocations.

In 2012, the Regional Board put forward the *Reconsideration of Certain Technical Matters for the Santa Monica Bay Beach Bacteria TMDLs; the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL; and the Los Angeles Harbor Inner Cabrillo Beach and Main Ship Channel Bacteria TMDL.* The reconsideration examined certain elements of the SMBBB TMDL, which is presented in **Table 3**. Through the reconsideration process, winter dry-weather single sample allowable exceedance days were increased for certain sites and modifications were made to the geometric mean calculation for all monitoring sites.

Table 3
Summary of Reconsideration Elements for SMBBB TMDL

TMDL	Reconsideration Items
Santa Monica Bay Beaches Dry-Weather TMDL	Re-consider TMDL to re-evaluate allowable winter dry weather exceedance days based on additional data on bacterial indicator densities in the wave wash, a reevaluation of the reference system selected to set allowable exceedance levels, and a re-evaluation of the reference year used in the calculation of allowable exceedance days.
Santa Monica Bay Beaches Wet-Weather TMDL	Refine allowable wet weather exceedance days based on additional data on bacterial indicator densities in the wave wash and an evaluation of site-specific variability in exceedance levels.
	Re-evaluate the reference system selected to set allowable exceedance levels, including a reconsideration of whether the allowable number of exceedance days should be adjusted annually dependent on the rainfall conditions and an evaluation of natural variability in exceedance levels in the reference system(s).
	Re-evaluate the reference year used in the calculation of allowable exceedance days.
	Re-evaluate whether there is a need for further clarification or revision of the geometric mean implementation provision.

The SMBBB TMDL establishes multi-part numeric targets for total coliform, fecal coliform, and enterococcus densities, reported as bacteria counts (Most Probable Number, MPN or colony forming unit, cfu) per 100 milliliters of sample. The TMDL waste load allocation (WLA), expressed as water quality-based effluent limitations (WQBELs), are based on the Los Angeles Basin Plan objectives for body-contact recreation (REC-1) as summarized in **Table 4.** Dry-weather WQBELs compliance was anticipated as of July 15, 2006 for summer dry weather, and July 15, 2009 for winter dry weather. Wet-weather compliance has been required as of July 15, 2013. This is based on Resolution 2006-008, in which the JG7 agencies elected to pursue a non-integrated water resources approach to SMBBB TMDL compliance, which resulted in a final wet weather compliance deadline of at most 10-years. Therefore, all milestones for SMB 7-06, SMB 7-08, and SMB 7-09 are currently enforceable (there are no interim targets).

Table 4
SMBBB TMDL Water Quality-Based Effluent Limitations and Receiving Water Limitations

Constituent	Daily Maximum	Rolling 30-day Geometric Mean[2]
Total coliform[1]	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.
2 The reopened 2012 TMDL modified the geometric mean calculation to weekly calculation of a rolling six week geometric mean using five or more sample, starting all calculation weeks on Sunday.

The allowable numbers of exceedance days of the single sample objectives at each of the monitored locations within the JG7 WMP area are summarized in **Table 5**.

Table 5
Annual Allowable Exceedance Days of the Single Sample Objective (days)[1]

Monitoring Sites	Beach Monitoring Locations	Summer Dry-Weather (April 1 - October 31)		Winter Dry-Weather (November 1 - March 31)		Wet-Weather (Year-round)	
		Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling
SMB 7-06	White's Point, Royal Palms County Beach	0	0	1	1	6	1
SMB 7-08	Point Fermin/Wilder Annex, San Pedro	0	0	1	1	2	1
SMB 7-09	Outer Cabrillo Beach	0	0	1	1	3	1

1 The final receiving water limitations are group-based and shared among all MS4 Permittees located within the sub-drainage area to each beach monitoring location.

In summary, to satisfy the monitoring requirements for the SMBBB TMDL, the existing bacteria TMDL monitoring sites (SMB 7-06, SMB-7-08, and SMB 7-09) will continue to be monitored in accordance to the Santa Monica Bay Beaches Bacteria TMDL Coordinated Shoreline Monitoring Plan (CSMP) (Technical Steering Committee 2004).

2.1.2 Santa Monica Bay Nearshore and Offshore Debris TMDL

Compliance with the SMB Debris TMDL is based on the final Numeric Target, WLA, and Load Allocation (LA), which are defined as zero trash in and on the shorelines of Santa Monica Bay, and no plastic pellets discharged from plastic manufacturers and facilities. The compliance deadline is to be achieved no later than March 20, 2020, and every year thereafter. If a Permittee adopts local ordinances to ban plastic bags, smoking in public places, and single-use expanded polystyrene food packaging by November 4, 2013, the final compliance deadline will be extended to March 20, 2023. The SMB Debris TMDL compliance is assessed in accordance with the Permittees' implementation of BMPs to address point and non-point source trash and plastic pellet abatement, and attainment of the progressive trash reductions in accordance with the TMDL compliance schedule as shown in **Table 6**.

Table 6
Santa Monica Bay Debris TMDL Compliance Schedule

Permittees	Baseline[1]	3/20/2016	3/20/2017	3/20/2018	3/20/2019	3/20/2020[2]
		Annual Trash Discharge (gals/yr)				
City of Los Angeles	25,112	20,090	15,067	10,045	5,022	0

1 If a Permittee elects not to use the default baseline, then the Permittee shall include a plan to establish a site specific trash baseline in their TMRP.
2 Permittees shall achieve their final effluent limitation of zero trash discharge for the 2019-2020 storm year and every year thereafter.

Permittees are to report their compliance strategy through the development of a Trash Monitoring and Reporting Plan (TMRP) and Plastic Pellets Monitoring and Reporting Plan (PMRP), or demonstrate that a PMRP is not required, to be approved by the Regional Board. The SMB Debris TMDL specifies that plastic pellet monitoring is not required if Permittees can provide documentation there are no industrial facilities or activities related to the manufacturing, handling, or transportation of plastic pellets within the jurisdiction. Once the TMRP and PMRP are approved and adopted, a progress report based on installation of structural BMPs, such as full capture or partial capture systems, institutional controls, or any BMPs, is to be reported in order to calculate the reduction in the amount of trash and plastic pellets, if applicable, being discharged into Santa Monica Bay.

Each of the jurisdictions within SMB JG7 WMP Group will submit or have submitted a TMRP and PMRP. Each jurisdiction has conducted the following:

- **City of Los Angeles**: The *Trash TMDL Compliance Method: Structural Measures* was submitted in September 2011 and was adopted as the TMRP for the City of Los Angeles. As indicated in **Table 1**, industrial land uses in the SMB JG7 WMP only account for 0.09 percent of the entire area, with that nearly negligible area identified as "navigation aids". It has also been verified with the Industrial Waste Management Division of the City of Los Angeles Bureau of Sanitation (LASAN) that within the JG7 WMP area, there are no facilities with standard industrial classification system (SIC) codes associated with plastic pellets (282X, 305X, 308X, 39XX, 25XX, 3261, 3357, 373X, and 2893) or facilities with the term "plastic" in the facility or operator name. Additionally, data obtained from the City of Los Angeles Planning Department, based on 2005 SCAG land use data, shows that there is no visible industrial zoning in the SMB JG7 WMP area (shown in **Figure 5**). Therefore, the SMB JG7 WMP Group is not subject to the plastic pellet monitoring requirements of the SMB Debris TMDL. The Illicit Connection Illicit Discharge Elimination Program Manual, developed by the City of Los Angeles Department of Public Works in 1999, contains the operational protocols and policies for City staff to address illicit discharges into the storm drain system. The following spill and response plan is in place both in general, as well as in the case of a plastic pellets spill:
    1. The City of Los Angeles has established a hotline (800-974-9794) where spills can be reported. This hotline can be contacted 24/7, and is managed by LASAN's Watershed Protection Division. Any spills reported to the City's 311 number or to LASAN's call center are immediately forwarded to this hotline.
    2. An environmental compliance inspector of LASAN's Watershed Protection Division (a total of about 15-20 inspectors) will inspect the location of the spill and evaluate the necessary next steps (determination of responsible party, clean-up, reporting/coordination with Department of Fish and Game).
    3. LASAN's Watershed Protection Division will coordinate the containment and clean-up of a plastic pellet spill. Containment may include the use of sand bags and/or mesh

screens to prevent plastic pellets from entering catch basins, or the use of trash booms if the pellets have reached the receiving water. LASAN's Watershed Protection Division has an emergency contract in place with a contractor to assist with immediate containment and clean-up needs.

- **LACFCD**: A PMRP was submitted on September 19, 2013 for all LACFCD within the Santa Monica Bay WMA. A TMRP was not submitted as the LACFCD does not have any land jurisdiction that generates trash.

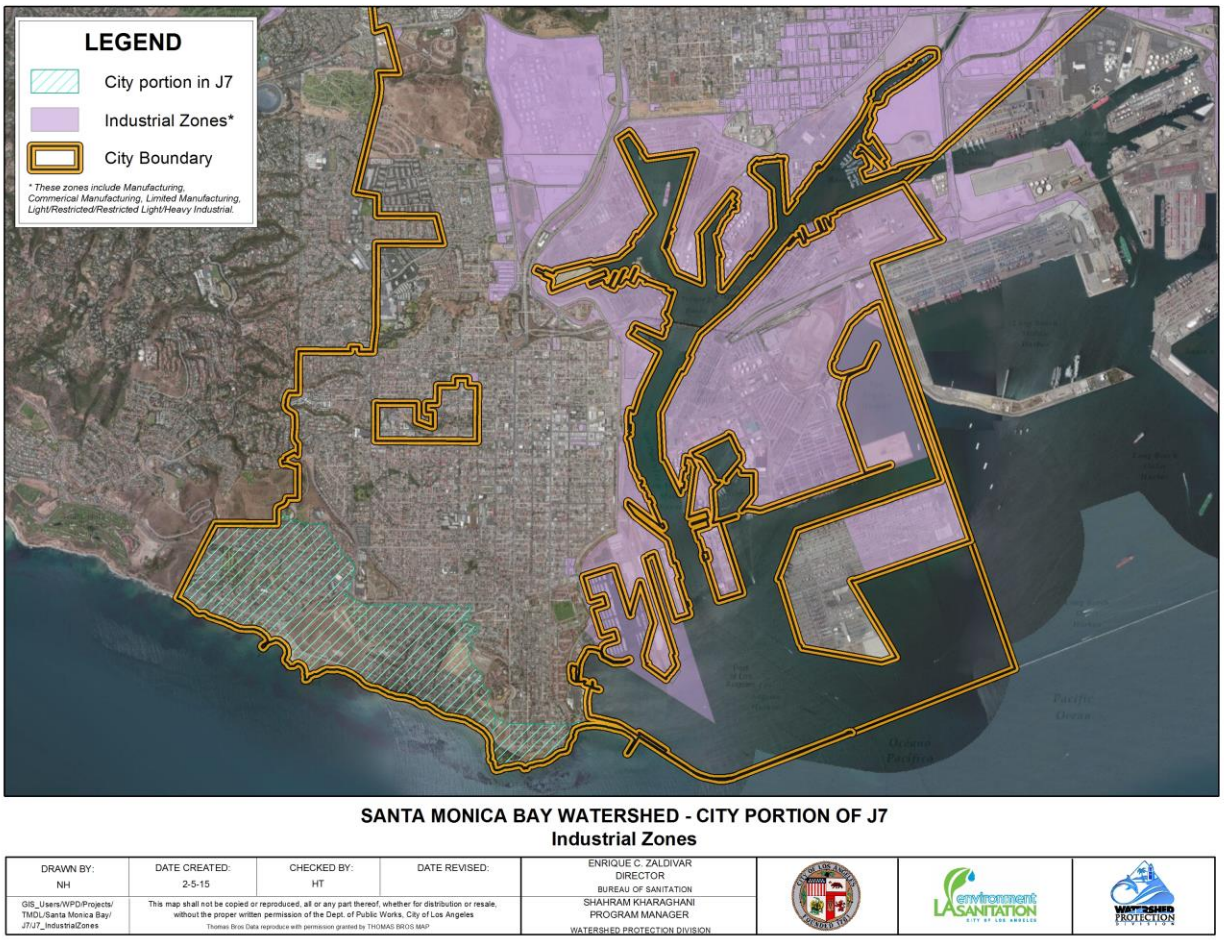


Figure 5. Industrial Zones in the City of Los Angeles Portion of JG7

All submitted TMRPs and PMRPs for each jurisdiction will be implemented by the corresponding jurisdiction, once approved by the Regional Board. As the SMB Debris TMDL is fulfilled through the implementation of BMPs to achieve compliance of zero trash in and on the shorelines of Santa Monica Bay, monitoring is not required if complying with the WLA. Manufacturers of plastic pellets were not identified within any of the SMB JG7 WMP Group's jurisdictional area, and monitoring for plastic pellets at the MS4 is not required. Appropriate actions for emergency spills and special circumstances for safety considerations are addressed for each jurisdiction.

2.1.3 Santa Monica Bay DDTs and PCBs TMDL

The SMB DDTs and PCBs TMDL are regulated for Santa Monica Bay from Point Dume to Point Vicente, and the Palos Verdes shelf from Point Vicente to Point Fermin. As the TMDL originates through the United States Environmental Protection Agency (USEPA), the Regional Board has been advised to implement the TMDL either through an implementation plan, NPDES permit, or other regulatory mechanisms such as State waste discharge requirements (WDRs), conditional waivers of WDRs, and/or enforcement actions. The Regional Board has decided to implement this TMDL through the MS4 Permit. Within the Permit, the WLA targets are stated in **Table 7**, which is expressed as an annual stormwater loading of pollutants to Santa Monica Bay from the LA County MS4.

Table 7
Santa Monica Bay DDTs and PCBs TMDL Waste Load Allocations

Constituent	Annual Mass-Based WLA (g/yr)[1]
Total DDT	27.08
PCBs	140.25

1 Compliance shall be determined based on a three-year averaging period. WLA is for entire LA County MS4.

The PCB and DDT TMDL states that the highest DDT and PCB loadings were from the Ballona Creek, Hermosa Beach, and Santa Monica Canyon Channel watersheds, which combined accounted for 94% of the developed area draining to Santa Monica Bay. Compliance with the WLAs for DDTs and PCBs will be assessed through monitoring conducted as part of the Peninsula Cities CIMP at Peninsula-SD2 rather than sampling in the JG7 WMP Group area. Data collected at Peninsula-SD2 would be extrapolated to the J7 WMP area by scaling land uses and/or drainage areas. Rationale for the selection of this site is provided in the following section.

2.2 CIMP RECEIVING WATER MONITORING SITE

The primary objective of receiving water monitoring is to assess trends in pollutant concentrations over time, or during specified conditions.

The City of Los Angeles and Peninsula Cities have agreed to share the data from monitoring performed by peninsula cities at RW-2 and its associated storm water outfall because of similarity of landuse primarily across the J7 area. The City of LA will use the data to evaluate its receiving water quality through an extrapolation methodology. The City will reimburse the peninsula cities through a cost sharing MOA or letter of agreement.

Data from receiving water monitoring for the Peninsula Cities CIMP at Peninsula-RW2 will be used to represent receiving water quality adjacent to the J7 WMP area. Such representative data would be extrapolated based on land use or drainage area to best reflect conditions with the J7 WMP area.

Alternatively, if data are not available at Peninsula-RW2, one alternate receiving water monitoring site, SMBJ7-RW-1, is being proposed within the Santa Monica Bay at a transect outward from the alternate CIMP outfall monitoring site SMBJ7-O-6. This location is consistent with the stormwater plume during a qualifying storm event when it has been deemed safe for collection by the Captain of the boat. Single grab samples would be collected from the mixing zone in the ocean, at the nearest distance from the shoreline that the Environmental Monitoring Division boat can safely access. **Figure 6** presents the approximate location of the receiving water monitoring site for the SMB JG7 WMP Group.

The JG7 WMP Group area consists solely of City of Los Angeles land. Primary land uses in the JG7 WMP Group area and the general catchment area of SMBJ7-RW-1 are residential and vacant. Given that the land uses of JG7 WMP and the catchment area are comparable, monitoring at SMBJ7-RW-1 is considered sufficiently representative of the JG7 WMP area. **Table 8** presents the land use composition of the HUC-12, the JG7 WMP area, and the catchment area of the proposed stormwater outfall SMBJ7-O-

6, which is considered an approximation of the drainage area tributary to the proposed receiving water site SMBJ7-RW-1.

Table 8
Land Use Overview of Outfall Nearest to Dry Weather Receiving Water Monitoring Site SMBJ7-RW-1

	HUC-12		J7 WMP Area		SMBJ7-RW-1	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Agriculture	90	0.4%	0.0	0%	0.0	0%
Commercial	1,231	5%	26	2%	0.0	0%
Education	806	3%	32	3%	2.8	2%
Industrial	1,488	6%	1.0	0.1%	0.0	0%
MF Residential	2,042	9%	151	14%	22	14%
SF Residential	11,265	47%	562	53%	126	78%
Transportation	1,957	8%	0.0	0%	0.0	0%
Vacant/Open Space	5,237	22%	284	27%	11	7%
Total	24,115	100%	1,056	100%	161	100%

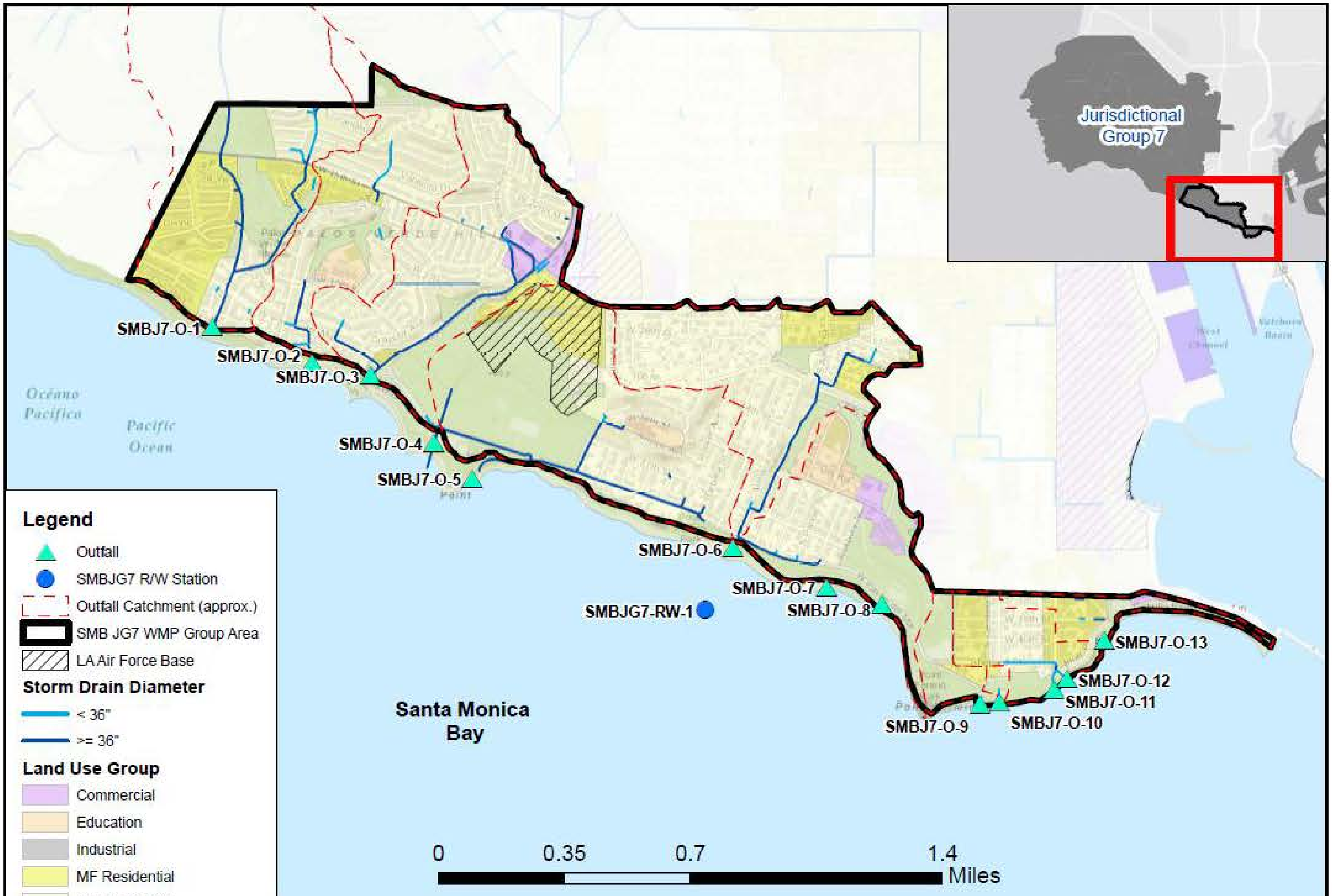


Figure 6
CIMP Monitoring Stations
SMB JG7 CIMP

April 2015

2.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION

The MRP section of the MS4 Permit identifies specific requirements for salt water (Santa Monica Bay). Wet- and dry-weather monitoring frequency, parameters, and duration will be addressed in the following sections. Parameters for monitoring were based on the MS4 Permit requirements as well as the water quality priorities as identified in the SMB JG7 WMP. Additional analytical and monitoring procedures are discussed in **Attachments B-D**. Parameters to be collected and sampling frequency to meet the receiving water monitoring requirements of the MRP are summarized in **Table 9**[1].

Table 9
Receiving Water Monitoring Parameters and Annual Frequency

Constituents	Wet Weather	Dry Weather
Field parameters(1)	3	1
Pollutants identified in Table E-2 of the MRP	1(2)	1(2)
Aquatic Toxicity and Toxicity Identification Evaluation (TIE)	2(3)	1
Total Coliform(4)	3	0
E. Coli (Fecal Coliform)(4)	3	0
Enterococcus(4)	3	0

1 Field parameters are defined as DO, pH, temperature, salinity (due to ocean monitoring), and specific conductivity and TSS
2 Monitoring frequencies only apply during the first year of monitoring. Except for constituents for which a TMDL has been established and interim compliance milestone dates have not passed or are currently being attained, monitoring for Table E-2 pollutants will be initiated if there are two consecutive exceedances observed during the same condition (i.e., wet or dry weather) and would continue until the deactivation criterion is triggered, which is defined as two consecutive samples that are not exceedances during the same condition (i.e., wet or dry weather). The activation and deactivation criteria avoid the possibility of performing additional sampling as a result of one-time events that may have resulted from sampling and/or analytical error.
3 A TIE is only required if either the survival or sublethal endpoint of the toxicity text demonstrates a percent effect value equal to or greater than 50% at the instream waste concentration.
4 Will be monitored at the existing CSMP monitoring locations and CSMP sampling schedule

2.3.1 Wet Weather

Wet-weather receiving water monitoring will be conducted for the duration of the MS4 permit. Data from the Peninsula Cities CIMP will be used as representative of the receiving water adjacent to the J7 WMP area due to the locations' proximity, land use, and topographic similarities. However, SMBJ7-RW-1 will serve as the alternate site in the case that the Peninsula CIMP data are not made available. Wet-weather conditions will be defined as a storm event of greater than or equal to 0.1 inch of precipitation, as measured from the closest Los Angeles County controlled rain gauge within the watershed. Wet-weather monitoring will be conducted initially for all MRP Table E-2 parameters during the first significant rain event of the first year of monitoring; three times a year for flow and field parameters, total coliform, E, coli (fecal coliform), and enterococcus; and twice a year for aquatic toxicity, per Part VI.C.1.a of the MRP.. Except for constituents for which a TMDL has been established and interim compliance milestone dates have not passed or are currently being attained, monitoring for Table E-2 pollutants will be initiated

[1] Because samples will be collected in Santa Monica Bay, suspended sediment concentrations will be significantly less than if collected in a creek or river, making collection of sufficient sediment to conduct the analysis most likely infeasible. As such, whole water samples will be analyzed consistent with standard receiving water monitoring for DDTs and PCBs.

RB-AR16932

if there are two consecutive exceedances observed during the same condition (i.e., wet or dry weather) and would continue until the deactivation criterion is triggered, which is defined as two consecutive samples that are not exceedances during the same condition (i.e., wet or dry weather). The activation and deactivation criteria avoid the possibility of performing additional sampling as a result of one-time events that may have resulted from sampling and/or analytical error. Wet-weather receiving water monitoring will target the first significant rain event of the storm year and will be performed in close coordination with stormwater outfall monitoring to be reflective of potential impacts from MS4 discharges.

2.3.2 Dry Weather

Outfall catchment areas in the SMB JG7 WMP Group area are relatively small, ranging from less than 140 acres to approximately 370 acres. During dry weather it is unlikely that discharge from these outfalls would be of sufficient quantity to impact the Santa Monica Bay, where wet weather monitoring is conducted. However, data from the Peninsula Cities CIMP will be used as representative of the receiving water adjacent to the J7 WMP area due to the locations' proximity, land use, and topographic similarities. Alternatively, if the adjacent CIMP data are not available, dry weather receiving water monitoring will be conducted at SMBJ7-RW-1.

2.4 RECEIVING WATER MONITORING SUMMARY

Data from the Peninsula Cities CIMP monitoring site Peninsula-RW2 will be used as representative of the receiving water adjacent to the J7 WMP area due to the locations' proximity, land use, and topographic similarities. Data from this site would be used for both wet and dry weather sampling, and potentially extrapolated based on land use or drainage area if deemed appropriate to best reflect the receiving water adjacent to the J7 WMP area. One alternate monitoring site within the JG7 WMP area has been selected in the case that Peninsula CIMP data are not made available: SMBJ7-RW-1. In this case, both wet and dry weather receiving water monitoring would be performed from a boat in the Santa Monica Bay, at a transect outward from SMBJ7-O-6, consistent with the stormwater plume during wet weather. The approximate location of this monitoring site is presented in **Figure 6**. A summary of constituents and monitoring frequency for the receiving water monitoring site was presented in **Table 9**. Sampling and analytical methods for receiving water monitoring is provided in **Attachments B-D**.

Section 3
MS4 Infrastructure Database

To meet the requirements of Part VII of the MRP, a map(s) and/or database of the MS4 storm drains, channels, and outfalls must be submitted with the CIMP and include the following information (Part VII.A of the MRP). The SMB JG7 WMP Group has gathered for submittal as a map and/or in a database the items below with the exception of numbers 9 and 11e, which will be determined as the CIMP progresses:

1. Surface water bodies within the Permittee(s) jurisdiction
2. Sub-watershed (HUC-12) boundaries
3. Land use overlay
4. Effective Impervious Area (EIA) overlay
5. Jurisdictional boundaries
6. The location and length of all open channel and underground pipes 18 inches in diameter or greater (with the exception of catch basin connector pipes)
7. The location of all dry-weather diversions
8. The location of all major MS4 outfalls within the Permittees' jurisdictional boundary. Each major outfall shall be assigned an alphanumeric identifier, which must be noted on the map
9. Notation of outfalls with significant non-stormwater discharges (to be updated annually)
10. Storm drain outfall catchment areas for each major outfall within the Permittee(s) jurisdiction
11. Each mapped MS4 outfall shall be linked to a database containing descriptive and monitoring data associated with the outfall. The data shall include:

    a. Ownership
    b. Coordinates
    c. Physical description
    d. Photographs of the outfall, where possible, to provide baseline information to track operation and maintenance needs over time
    e. Determination of whether the outfall conveys significant non-stormwater discharges
    f. Stormwater and non-stormwater monitoring data

Figures 1 through **3** present the available database information, listed above, for the SMB JG7 WMP Group. Each year, a storm drain, channel, outfall map as well as an associated database for the SMB JG7 WMP Group are required to be updated to incorporate the most recent characterization data for outfalls with significant non-stormwater discharge. As further investigations are conducted and additional data is collected, updates to the maps and/or database will be conducted over time. Updates to the maps and/or database will be submitted through the Annual Report.

Table 10 below summarizes the sources of the GIS data used to generate the maps and database.

Table 10
GIS Data Sources

Description	Source	Attributes
HUC 12 watersheds	Regional Water Quality Control Board	Watershed name
Storm drains	Los Angeles County Flood Control District and City of Los Angeles	Owner and size
LA Air Force Base	Delineated in-house	N/A
Topographic basemap	ESRI	N/A
EWMP and WMP Groups	Regional Water Quality Control Board	EWMP or WMP Group Name
Land use descriptions and percent impervious values	Los Angeles County	Land use names and groups, percent impervious
Outfalls	LACFCD provided major outfalls, others identified in-house,	Outfall name
Drainage areas to outfalls	Delineated in-house	CatchID
TMDL monitoring stations	Coordinated Shoreline Monitoring Plan	Site ID
Bight program monitoring station	Bight	Station name
SMB J2/J3 CIMP monitoring stations	J2/J3 CIMP	Station ID

Section 4
Stormwater Outfall Monitoring

Stormwater outfall monitoring assesses compliance with municipal action limits (MALs), WQBELs derived from TMDL WLAs, as well as the potential to cause or contribute to exceedances of RWLs derived from TMDL WLAs or receiving water quality objectives. The majority of SMB JG7 WMP Group storm drains generally drain towards Santa Monica Bay. An analysis of land use per HUC-12, drainage area and SMB JG7 WMP Group area was conducted for the monitoring site.

4.1 PROGRAM OBJECTIVES

As outlined in the Part VIII.A of the MRP, stormwater discharges from the MS4 shall be monitored at outfalls and/or alternative access points such as manholes, or in channels representative of the land uses within the Permittees' jurisdiction to support meeting the three objectives of the stormwater outfall based monitoring program:

1. Determine the quality of a Permittee's discharge relative to MALs;
2. Determine whether a Permittee's discharge is in compliance with applicable stormwater WQBELs derived from TMDL WLAs; and
3. Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

Each potential stormwater outfall monitoring site was evaluated and assessed on how representative it is of the surrounding land use of the SMB JG7 WMP Group area, jurisdictions, and the HUC-12. Each zoning category provided by the RAA guidance manual was fit into one of the following eight land use categories:

- Agricultural
- Industrial
- Single Family Residential
- Vacant/Open Space
- Commercial
- Education
- Multi-Family Residential
- Transportation

4.2 STORMWATER OUTFALL MONITORING SITES

Due to inaccessibility of outfalls within the City of Los Angeles area in J7, and because of similarity of landuse primarily across the J7 area, the City of Los Angeles and Peninsula Cities have agreed to share the data from monitoring performed by peninsula cities at RW-2 and its associated storm water outfall. The City of LA will use the data to evaluate its receiving water quality, stormwater outfall and the storm born sediment for DDT, PCB through an extrapolation methodology. The City will reimburse the peninsula cities through a cost sharing MOA or letter of agreement.

Data from stormwater outfall monitoring for the Peninsula Cities CIMP will be used to represent stormwater quality from the J7 WMP area. If data from the Penisula Cities is unavailable, data from stormwater outfall monitoring from Santa Monica Bay J2/J3 will be used to represent stormwater quality from the J7 WMP area. Such representative data would potentially be extrapolated based on land use or drainage area to best reflect conditions with the J7 WMP area.

Alternatively, if data from the adjacent CIMPs are not available or deemed not representative, one primary stormwater outfall monitoring site and one alternate site, as shown in **Figure 6**, has been selected for monitoring, pending further evaluation for safe access.

Site SMBJ7-O-6, identified as the primary monitoring site, is located north of SMBBB TMDL monitoring location SMB-7-08. This outfall is an 18-feet by 25-feet reinforced concrete box structure that, based on the GIS data, appears to be the outfall for a 66-inch diameter reinforced concrete pipe. The outfall is located near the intersection of Paseo del Mar and Almeria Street.

Site SMBJ7-O-3, selected as the alternate monitoring site, is located near SMBBB TMDL monitoring location SMB-7-06. This stormwater outfall is a 2-feet diameter pipe that carries flow from the upper canyon under the pathway to the beach front.

Runoff from both SMBJ7-O-3 and SMBJ7-O-6 is solely from the City of Los Angeles. **Table 11** compares the land use composition of these catchment areas, HUC-12, and the SMB JG7 WMP Group area. Although this table reflects the same delineation for SMBJ7-O-6 as presented for SMBJ7-RW-1, it should be noted that the area tributary to an offshore location is likely larger than the outfall delineation area. Additionally, pending an accessibility review, if conditions prohibit safe access to these sites another location may be selected.

Table 11
Land Use Overview of Potential Outfall Monitoring Sites

	HUC-12		J7 WMP Area		SMBJ7-O-3		SMBJ7-O-6	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Agriculture	90	0.4%	0.0	0%	0.0	0%	0.0	0%
Commercial	1,231	5%	26	2%	14	8%	0.0	0%
Education	806	3%	32	3%	0.0	0%	2.8	2%
Industrial	1,488	6%	1.0	0.1%	0.0	0%	0.0	0%
MF Residential	2,042	9%	151	14%	7.3	4%	22	14%
SF Residential	11,265	47%	562	53%	131	75%	126	78%
Transportation	1,957	8%	0.0	0%	0.0	0%	0.0	0%
Vacant/open	5,237	22%	284	27%	24	14%	11	7%
Total	24,115	100%	1,056	100%	177	100	161	100%

4.3 MONITORING FREQUENCY, PARAMETERS, AND DURATION

The stormwater outfall monitoring site will be monitored for three (3) storm events per year, in coordination with and prior to receiving water monitoring, for all required constituents except aquatic toxicity. Samples will be collected by continuous auto-sampler, within the collection period targeting the entire storm water discharge for storms lasting less than 24 hours, or a minimum of the first 24 hours of the storm water discharge for storms lasting more than 24 hours. Permanent auto-samplers will be installed within 18 months of CIMP approval. If the installation of permanent automatic stormwater samplers cannot be expedited, the City will have the option to conduct water quality sampling using time-weighted temporary/portable sampling equipment, as a first option, or collecting a grab sample every 20 minutes for three hours or the duration of the storm (if less than three hours), as a second option (USEPA, 1992a). Aquatic toxicity will be monitored when triggered by recent receiving water toxicity monitoring, where a toxicity identification evaluation (TIE) on the observed receiving water toxicity test was inconclusive. The requirements for monitored constituents at the monitoring site are outlined in the MRP Section VIII.B.1.c and presented in **Table 12**. Parameters in Table E-2 of the MRP, as listed in **Attachment B**, will not be included as part of outfall monitoring until after the first year of receiving water monitoring if it is determined there are parameters in Table E-2 present in concentrations exceeding the applicable water quality objective in the receiving water. Monitoring for the selected site would occur for at least the duration of the Permit term, unless an alternative site is warranted, per the adaptive management process, as presented in **Section 10**. Additional analytical and monitoring procedures are discussed in **Attachment B**.

Table 12
Stormwater Outfall Monitoring Parameters and Annual Frequency

Constituents	**Annual Frequency**
Flow, hardness, pH, dissolved oxygen, temperature, specific conductivity, and TSS	3
Table E-2 pollutants detected above relevant objectives in receiving waters[2]	3
Aquatic Toxicity and Toxicity Identification Evaluation (TIE)	(see note 1)
Total Coliform	3
Fecal Coliform / (*E. coli*)	3
Enterococcus	3

1. Toxicity is only monitored from outfalls when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test was inconclusive. If toxicity is observed at the outfall a TIE must be conducted.
2. All Table E-2 parameters may not be tested at the outfall in the first monitoring year. Instead, if water quality objectives are exceeded in the receiving water during the first significant storm event, then those exceeding parameters would be tested at the outfall three times annually beginning with the next storm event that occurs at least 50-days later.

Section 5
Non-Stormwater Outfall Screening and Monitoring Program

The MRP requires Permittees to implement a non-stormwater outfall-based screening and monitoring program. The Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) is focused on non-stormwater discharges to receiving waters from major outfalls.

5.1 PROGRAM OBJECTIVES

The objectives of the Non-Stormwater Program include the following (Part II.E.3 of the MRP):

a. Determine whether a Permittee's discharge is in compliance with applicable non-stormwater WQBELs derived from TMDL WLAs;
b. Determine whether a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of the MS4 Permit;
c. Determine whether a Permittee's discharge contributes to or causes an exceedance of receiving water limitations; and
d. Assist a Permittee in identifying illicit discharges as described in Part VI.D.10 of the MS4 Permit.

Additionally, the outfall screening and monitoring process is intended to meet the following objectives (Part IX.A of the MRP):

1. Develop criteria or other means to ensure that all outfalls with significant non-stormwater discharges are identified and assessed during the term of this MS4 Permit.
2. For outfalls determined to have significant non-stormwater flow, determine whether flows are the result of illicit connection/illicit discharge (IC/IDs), authorized or conditionally exempt non-stormwater flows, natural flows, or from unknown sources.
3. Refer information related to identified IC/IDs to the IC/ID Elimination Program (Part VI.D.10 of the MS4 Permit) for appropriate action.
4. Based on existing screening or monitoring data or other institutional knowledge, assess the impact of non-stormwater discharges (other than identified IC/IDs) on the receiving water.
5. Prioritize monitoring of outfalls considering the potential threat to the receiving water and applicable TMDL compliance schedules.
6. Conduct monitoring or assess existing monitoring data to determine the impact of non-stormwater discharges on the receiving water.
7. Conduct monitoring or other investigations to identify the source of pollutants in non-stormwater discharges.
8. Use results of the screening process to evaluate the conditionally exempt non-stormwater discharges identified in Parts III.A.2 and III.A.3 of the MS4 Permit and take appropriate actions pursuant to Part III.A.4.d of the MS4 Permit for those discharges that have been found to be a source of pollutants. Any future reclassification shall occur per the conditions in Parts III.A.2 or III.A.6 of the MS4 Permit.
9. Maximize the use of Permittee resources by integrating the screening and monitoring process into existing or planned Integrated Monitoring Program (IMP) and/or CIMP efforts.

5.2 NON-STORMWATER OUTFALL SCREENING AND MONITORING PROGRAM

The Non-Stormwater Program is focused on dry-weather discharges to receiving waters from major outfalls. The Program fills two roles: (1) to provide assessment of whether the non-stormwater discharges are potentially impacting the receiving water, and (2) to determine whether significant non-stormwater discharges are allowable. The Program is complimentary to the IC/ID minimum control measure.

For the SMB JG7 WMP Group area, all major outfalls will be screened prior to proceeding with dry weather monitoring. To determine whether an outfall must be monitored for non-stormwater discharges, the SMB JG7 WMP Group has developed an outfall screening and monitoring program. The sections starting with **Section 5.3** are part of the monitoring program. Within 90 days of the approval of this CIMP, the SMB JG7 WMP Group will initiate steps to identify and monitor the non-stormwater discharges. The non-stormwater outfall program will involve following steps:

1. **Outfall Screening**: The SMB JG7 WMP Group will implement a screening process to determine whether the monitoring site exhibits non-stormwater discharges and if so, if it is considered significant or if it can be excluded from further investigation. This process will include: 1) updating the outfall inventory, 2) measuring observed flows, and 3) testing for E. coli where flow is observed.
2. **Prioritized Source Investigation** (Part IX.E of the MRP): The SMB JG7 WMP Group will use the data collected as part of the Outfall Screening process to prioritize outfalls for source investigations.
3. **Significant Non-stormwater Discharge Source Identification** (Part IX.F of the MRP): If the monitoring site exhibits significant non-stormwater discharges, the SMB JG7 WMP Group will perform source investigations per the established prioritization.
4. **Monitoring Non-Stormwater Discharges Exceeding Criteria** (Part IX.G of the MRP): Using the information collected during screening and source identification efforts, the SMB JG7 WMP Group will monitor the site if it has been determined to convey significant non-stormwater discharges comprised of either unknown or non-essential conditionally exempt non-stormwater discharges, or continuing discharges attributed to illicit discharges. Dry weather monitoring will be conducted in the month of August, which is the historically driest month on record for the SMB JG7 WMP Group area[2].

5.3 IDENTIFICATION OF OUTFALLS WITH SIGNIFICANT NON-STORMWATER DISCHARGES

An initial field survey was conducted for the identification of outfalls in the JG7 WMP Group area, the majority of which were observed to be corrugated metals pipes protruding from the top of rocky cliffs above rocky beaches. As described in the field survey, observation of outfalls was limited by accessibility and safety constraints. **Attachment C** presents the photos from this field survey.

Based on a review of the available information, identification of significant non-stormwater discharges is not available at this time. The SMB JG7 WMP Group has undertaken a field reconnaissance to evaluate the major outfall(s), in its jurisdiction, dependent on accessibility. A major outfall for the SMB JG7 WMP Group is defined as follows:

[2] The driest month on record was determined based on the rainfall records at the LA County DPW gauges at Palos Verdes and Torrance Airport, between 1996 and 2008.

- 36-inch or larger pipes
- 12-inch or larger pipes from industrial zoned areas

Table 13 summarizes the pertinent information for each of the outfalls in the SMB JG7 WMP Group area. As shown, six of the 13 outfalls qualify as major outfalls and will be included in the non-stormwater outfall screening process, noting that accessibility and safety constraints may still limit access to these outfalls.

Table 13
Non-Stormwater Screening Sites in SMB JG7 WMP Group Area

Station ID	Type of Outlet	Outlet Size	Major Outfall?
SMBJ7-O-1	Corrugated metal pipe	84-inch diameter	Yes
SMBJ7-O-2	Corrugated metal pipe	48-inch diameter	Yes
SMBJ7-O-3(1)	Corrugated metal pipe	72-inch diameter	Yes
SMBJ7-O-4	Corrugated metal pipe	36-48-inch diameter (approx.)	Yes
SMBJ7-O-5(2)	Reinforced concrete pipe (damaged in landslide, replaced by plastic pipe)	36-inch diameter (approx.)	Yes
SMBJ7-O-6	Reinforced concrete pipe (however, appears to be reinforced concrete box at outfall)	66-inch diameter	Yes
SMBJ7-O-7(3)	Corrugated metal pipe (broken)	18-inch diameter (approx.)	No
SMBJ7-O-8	Corrugated metal pipe	18-inch diameter (approx.)	No
SMBJ7-O-9	Corrugated metal pipe	21-inch diameter	No
SMBJ7-O-10	Brick	24-inch diameter	No
SMBJ7-O-11	Corrugated metal pipe	27-inch diameter	No
SMBJ7-O-12	Vitrified clay pipe	16-inch diameter	No
SMBJ7-O-13	Polyethylene lined	12-inch diameter	No

1 Adjacent to SMB 7-06
2 Adjacent to SMB 7-07
3 Adjacent to SMB-7-08

In order to collect data to determine whether the outfalls contribute significant non-stormwater discharge, the SMB JG7 WMP Group has already performed three non-stormwater outfall screenings on major outfalls between April and August of 2014 to ensure the source investigation schedule (25 percent by December 2015 and 100 percent by December 2017) was met. The SMB JG7 WMP Group has identified *E. coli* and flow as the primary characteristic for determining significant non-stormwater discharges and will monitor for *E. coli* and flow during the three initial screening. The initial screening serves the dual purpose of data collection for completing the MS4 infrastructure database, addressed in **Section 3**, and the initial evaluation of the outfall for significant non-stormwater discharge. Criteria for identifying significant non-storm water discharges will be determined based on the screening results (e.g., which outfalls, if any, are flowing, how the flows compare relative to one another, the laboratory results for E. coli, etc.). A standard field data collection form will be used, including information fields for:

- Channel bottom, calculated flow
- Whether discharge ponds, or reaches the receiving water
- Clarity
- Presence of odors and foam

RB-AR16941

Additionally, outstanding information for the MS4 inventory database will be collected, including, at a minimum, geographically referenced photographs. The inventory of MS4 outfalls will identify those with significant non-storm water discharges and those that do not require further assessment, including the rationale for such determination if no further action is required. The database will contain outfall locations linked to storm drains, channels, and outfalls map, which will be updated annually to incorporate the most recent data for outfalls with significant non-storm water discharge.

At least one re-assessment of the non-storm water outfall-based screening and monitoring program will be conducted during the term of the Permit term to determine whether changes or updates are needed. Seasonal variability will be considered in the timing of the re-assessment. If changes are needed, they will be specified in written program documents, to be implemented after approval from the Los Angeles Board Regional Board Executive Officer, and described in the next annual report.

5.4 PRIORITIZED SOURCE IDENTIFICATION

If any outfalls exhibiting significant NSW discharges are identified through the Outfall Screening process and incorporated into the inventory, Part IX.E of the MRP requires that the Permittees prioritize the outfalls for further source investigations.

The following prioritization criteria will be utilized initially and may be revised as priorities in the JG7 WMP area change:

1. Outfalls with the highest loading based on considerations related to E. coli.
2. Outfalls for which monitoring data exist and indicate recurring exceedances of one or more of the NSW Action Levels identified in Attachment G of the Permit. Once the prioritization is completed, a source identification schedule will be developed. The schedule will focus on the outfalls with the highest E. coli loading rate first and ensure that source investigations are completed on no less than 25% of the outfalls with significant NSW discharges by December 28, 2015 and 100% by December 28, 2017.

5.5 SIGNIFICANT NON-STORMWATER DISCHARGE SOURCE IDENTIFICATION

Based on the prioritized list of major outfalls with significant NSW discharges, investigations must be conducted to identify the source(s) or potential source(s) of non-stormwater discharge.

Part IX.A.2 of the MRP requires Permittees to classify the source identification results into the following types as summarized in **Table 14**:

A. **IC/ID**: If the source is determined to be an illicit discharge, then the Permittee must implement procedures to eliminate the discharge consistent with IC/ID requirements (Permit Part VI.D.10) and document actions.
B. **Authorized or Conditionally-Exempt Non-Stormwater Discharges**: If the source is determined to be an NPDES permitted discharge, a discharge subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or a conditionally exempt essential discharge, then the Permittee must document the source. For non-essential conditionally exempt discharges, the Permittee must conduct monitoring consistent with Part IX.G of the MRP to determine whether the discharge should remain conditionally exempt or be prohibited.
C. **Natural Flows**: If the source is determined to be natural flows, then the Permittee must document the source.

D. **Unknown Sources**: If the source is unknown, then the Permittee must conduct monitoring consistent with Part IX.G of the MRP.

E. **Originates Upstream of SMB JG7 WMP Group**: If the source is determined to originate from an upstream WMA, then the Permittee must inform the upstream WMA and Regional Board in writing within 30 days of identifying the presence of the discharge, provide all available characterization data and determination efforts, and document actions taken to identify its source.

Table 14

Source Identification Types

Type	Follow-up	Action Required by Permit
A. Illicit Discharge or Connection	Refer to IC/ID program	Implement control measures and report in annual report. Monitor if cannot be eliminated.
B. Authorized or Conditionally Exempt Discharges[1]	Document and identify if essential or non-essential	Monitor non-essential discharges
C. Natural Flows	End investigation	Document and report in annual report
D. Unknown	Refer to IC/ID program	Monitor
E. Upstream of SMB JG7 WMP Group	End investigation	Inform upstream WMA and the Regional Board in writing within 30 days of identifying discharge.

1 Discharges authorized by a separate NPDES permit, a discharge subject to a Record of Decision approved by USEPA pursuant to section 121 of CERCLA, or is a conditionally exempt NSW discharge addressed by other requirements. Conditionally exempt NSW discharge addressed by other requirements are described in detail in Part III.A. Prohibitions – NSW Discharges of the Permit.

Source identification will be conducted using site-specific procedures based on the characteristics of the non-stormwater discharge. Investigations could include:

- Performing field measurements to characterize the discharge;
- Following dry-weather flows from the location where they are first observed in an upstream direction along the conveyance system; and
- Compiling and reviewing available resources, including past monitoring and investigation data, land use/MS4 maps, aerial photography, and property ownership information.

Where the source identification has determined the non-stormwater source to be authorized, natural, or essential conditionally-exempt flows, and it has been determined that the source is not causing or contributing to exceedances in the receiving water, then the outfall will require no further assessment. However, if the source identification determines that the source of the discharge is non-essential conditionally exempt, an ID, or is unknown, then further investigation will be conducted to eliminate the discharge or to demonstrate that it is not causing or contributing to receiving water impairments and will be added to the monitoring list until non-stormwater discharge is eliminated.

In some cases, source investigations may ultimately lead to prioritized programmatic or structural BMPs. Where the SMB JG7 WMP Group has determined that they will address the non-stormwater discharge through modifications to programs or by structural BMP implementation, the SMB JG7 WMP Group will incorporate the approach into the implementation schedule developed in the EWMP, and monitoring of the outfall may be discontinued.

5.6 NON-STORMWATER DISCHARGE MONITORING

As outlined in the MRP (Part II.E.3), outfalls with significant non-stormwater discharges that remain unaddressed after source investigation shall be monitored to meet the following objectives:

a. Determine whether a Permittee's discharge is in compliance with applicable dry-weather WQBELs derived from TMDL WLAs;
b. Determine whether the quality of a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of the Permit; and
c. Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

Thus, if any outfalls have been determined to convey significant non-stormwater discharges where the source identification concluded that the source is attributable to a continued ID (Type A from **Table 14)** non-essential conditionally exempt (Type B from **Table 14**), or unknown (Type D from **Table 14**) the site must be monitored. Monitoring will begin within 90 days of completing the source identification and will be coordinated with dry weather receiving water sampling efforts.

5.6.1 Monitoring Frequency, Parameters, and Duration

After the outfall screening and determination of the outfall(s) that have significant non-stormwater flows, those site(s) will be monitored. While a monitoring frequency of four times per year is specified in the Permit, it is inconsistent with the dry weather receiving water monitoring requirements. The receiving water monitoring requires two dry weather monitoring events per year. As a result, the SMB JG7 WMP Group will conduct required NSW outfall monitoring twice per year. Alternatively, if monitoring twice per year is not permitted, then bacteria related sampling can be conducted during dry weather four times per year and all other constituents twice per year. The NSW outfall monitoring events will be coordinated with the dry weather receiving water monitoring events, which would then be triggered, to allow for an evaluation of whether the NSW discharges are causing or contributing to an observed exceedance of water quality objectives in the receiving water. At the SMB JG7 WMP beaches, fecal indicator bacteria are highest priority during dry weather and are considered a primary metric for determining significant NSW discharges. As noted on page 5 of Attachment E of the MS4 Permit, grab samples will be taken for constituents that are required to be collected as such, including fecal indicator bacteria. Because dry weather receiving water monitoring and sampling occurs as grab samples, the NSW outfall samples will also be collected as grab samples.

If the outfall(s) are found to be significant non-stormwater outfall(s), they will be monitored for all required constituents as outlined in Part IX.G.1.a-e of the MRP, except toxicity. Toxicity monitoring is only required when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test identified pollutants during dry weather, or where the TIE results were inconclusive. If the discharge exhibits aquatic toxicity, then a TIE shall be conducted. An overview of the constituents to be monitored and the corresponding frequency is listed in **Table 15**. The outfall(s) will be monitored for at least the duration of the Permit term, or until the non-stormwater discharge is eliminated. Additional analytical and monitoring procedures are discussed in **Attachments B-D**.

Table 15
Non-stormwater Outfall Monitoring Parameters and Annual Frequency (Year 1)

Constituent	Annual Frequency
Flow, hardness, pH, dissolved oxygen, temperature, specific conductivity, and TSS	2
Table E-2 pollutants detected above relevant objectives	2
Aquatic Toxicity and Toxicity Identification Evaluation (TIE)[1]	TBD
Total Coliform [2]	2
E. Coli (Fecal Coliform)[2]	2
Enterococcus[2]	2

[1] Toxicity is only monitored from outfalls when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test identified pollutants or the results of the TIE were inconclusive. If toxicity is observed at the outfall a TIE must be conducted.
[2] If monitoring twice per year for all constituents is not permitted, then bacteria related sampling can be conducted during dry weather four times per year and all other constituents twice per year.

5.7 NON-STORMWATER OUTFALL PROGRAM SUMMARY

The SMB JG7 WMP Group will conduct the following steps as part of the non-stormwater outfall program at all major outfalls in the SMB JG7 WMP Group area:

1. Perform the outfall screening and determine whether any major outfall has significant non-stormwater discharge (Part IX.C of the MRP);
2. Identify sources of significant non-stormwater discharges (Part IX.F of the MRP); and, if relevant
3. Continue to monitor NSW discharges which exceed the criteria (Part IX.G of the MRP).

As non-stormwater discharges are addressed, monitoring at the outfall(s) will cease. Additionally, if monitoring demonstrates that discharges do not exceed any WQBELs, action levels or water quality standards for pollutants identified on the 303(d) list, then modifications to the monitoring program, specifically the elimination of parameters/constituents may be proposed and will be subject to approval by the Executive Officer of the Regional Board.

Section 6
New Development/Re-Development Effectiveness Tracking Program

The New Development/Re-Development Effectiveness Tracking Program is used for tracking information data in regards to new and re-development activities. To meet the MRP requirements of Permit Attachment E, Part X.A, the SMB JG7 WMP Group will maintain an informational database record for each new development/re-development project subject to the MCM requirements in Part VI.D.7 of the Permit and their adopted LID Ordinance. The database should track the following information:

1. Name of the Project and Developer;
2. Mapped project location (preferably linked to the Geographic Information System (GIS) storm drain map);
3. Issuance date of the project Certificate of Occupancy;
4. 85^{th} percentile 24-hour storm event for project design (inches);
5. 95^{th} percentile 24-hour storm event for projects draining to natural water bodies (inches);
6. Other design criteria required to meet hydromodification requirements for drainages to natural water bodies;
7. Project design storm (inches per 24 hours);
8. Project design storm volume (gallons or million gallons);
9. Percent of design storm volume to be retained onsite;
10. Design volume for water quality mitigation treatment BMPs (if any);
11. If flow through, water quality treatment BMPs are approved, provide the one-year, one-hour storm intensity as depicted on the most recently issued isohyetal map published by the Los Angeles County Hydrologist;
12. Percent of design storm volume to be infiltrated at an off-site mitigation or groundwater replenishment project site;
13. Percent of design storm volume to be retained or treated with biofiltration at an off-site retrofit project;
14. Location and maps (preferably linked to the GIS storm drain map) of off-site mitigation, groundwater replenishment, or retrofit sites; and
15. Documentation of issuance of requirements to the developer.

Until the WMP is approved by the Regional Board or the Executive Officer, the SMB JG7 WMP Group is only required to implement and track MCM information in its existing stormwater management program per Part V.C.4.d.i.

In addition to the requirements in Part X.A of the MRP, Part VI.D.7.d.iv of the Permit requires that the SMB JG7 WMP Group implement a tracking system for new development/re-development projects that have been conditioned for post-construction BMPs. The following information is to be tracked using GIS or another electronic system:

1. Municipal Project ID
2. State Waste Discharge Identification (WDID) Number
3. Project Acreage
4. BMP Type and Description
5. BMP Location (coordinates)
6. Date of Acceptance

RB-AR16946

7. Date of Maintenance Agreement
8. Maintenance Records
9. Inspection Date and Summary
10. Corrective Action
11. Date Certificate of Occupancy Issued
12. Replacement or Repair Date

6.1 PROGRAM OBJECTIVES

The objective of the New Development/Re-Development Effectiveness Tracking is to assess whether post-construction BMPs, as outlined in permits issued by the Permittees, are implemented, and to ensure the volume of stormwater associated with the design storm is retained onsite, as required by Part VI.D.7.c.i. of the Permit. The New Development/Re-Development Effectiveness Tracking will gather necessary data to assess whether construction MCM, LID ordinances and BMPs are effective and being implemented.

6.2 EXISTING NEW DEVELOPMENT/RE-DEVELOPMENT TRACKING PROCEDURES

The City of Los Angeles has an established process of tracking some or the entire 27 required development program tracking elements (15 elements identified in Attachment E.X.A and 12 elements in Part VI.D.7.d.iv.).

6.3 SPECIAL CONSIDERATIONS FOR DATA MANAGEMENT AND REPORTING

A fundamental step in establishing individual data management protocols consists of developing a recommended standard operating procedure (SOP) and determining the responsible person within each City department for collecting, reviewing, and reporting the data. The SOP developed by the City of Los Angeles will consist of written instructions regarding documentation of routine activities and delineation of the primary steps in the land development approval process, relevant data generated at each step, and procedures for "handoff" of the project to the next group. Development and use of an SOP is an integral part of successful data management as it provides information to perform a task properly, and facilitates consistency in the quality and integrity of the tracking data.

6.3.1 Data Management

The City will conduct tracking to meet Permit requirements and facilitate reporting. The data management protocols will include:

- Designing and testing data entry sheets for the required information fields identified in **Section 6.1**;
- Describing the procedures and identifying the persons responsible for inputting data, assessing accuracy and consistency, and coordinating follow up actions when questions arise;
- Strategy for checking and validating data entry, including identifying persons responsible for managing and safeguarding data, performing data entry, supervising the data entry, and ensuring quality control of the data; and
- Specifying procedures for routinely and safely archiving data files.

Data collection for development review processes generally consist of the following similar steps:

RB-AR16947

- **Planning**: Project proponents submit an application to agency planning department to determine whether or not the project meets jurisdictional requirements. When required, the project may require a public hearing for conditions and entitlements. Project conditions may include water quality related requirements.
- **Building**: Projects may be conditioned subject to engineering, community services, or building department review and approval of plans or technical reports. During review, required water quality BMP designs are reviewed and accepted. When a building and/or grading permit is issued, project construction usually proceeds without further discretionary approvals.
- **Construction**: During construction, approved BMPs are implemented and then verified by the jurisdiction's inspector prior to issuance of a Certificate of Occupancy.
- **Post-Construction Inspections**: Once constructed, inspection and verification of maintenance is transferred to the jurisdiction's water quality program manager.

Relevant project data is collected during each phase of the development review process described above. Based on this general process and information gathered through the questionnaire, **Table 16** illustrates data collection opportunities throughout the planning, building, construction, and post-construction inspection processes for requirements in Part VI.D.7 of the Permit.

Table 16
Development Review Process and Data Collection

Stage	Process	Data Collection Opportunity
Planning	Planning review, conditions, and entitlements	Project name
		Developer name
		Location/Map
		Documentation of issuance of requirements
Building	Engineering review and approval of plans and technical reports	85th and 95th percentile storm event criteria
		Other hydromodification management requirements
		Project design storm intensity and volume
		Percent of design storm volume retained onsite
		Design volume for treatment BMPs
		One year/one hour storm intensity
		Percent of design storm infiltrated offsite
		Percent of design storm retained/treated with biofiltration offsite
		Location/Maps of offsite mitigation
Construction	Approval of BMP construction and issuance of Certificate of Occupancy	Issuance date of Certificate of Occupancy
Post-Construction Inspections	Inspection and tracking of post-construction BMPs	Inspection and maintenance dates

6.3.2 Additional Data

To facilitate annual assessment and reporting and future Reasonable Assurance Analyses (RAA) input data compilation, the SMB JG7 WMP Group may also track the following questions and/or information:

- Do any modified MCMs apply to this project?

- Assessor's Identification Number (AIN)
- Street address
- Revised land use (based on City/County Land Use Categories)
- BMP maintenance funding source
- Tributary area to each BMP

6.3.3 Reporting

Development of a data collection template and established SOPs will aid in future analyses and annual reporting. The example data collection template, presented in **Table 17**, includes the information to be tracked for each project.

Table 17
Example Data Collection Template

PLANNING									
Project Name / Description	New or Re-Development	Planning ID	Name of Developer	Assessor's Identification Number (AIN)	Location (Lat/Long or Cross Streets)	Address	City	Zip	Issuance of Requirements Date
ABC Development	*New Development*	*PA14-0001*	*XYZ Development, LLC*	*4272-029-017*	*Paseo Del Mar and Almeria Street 33.711563, -118.303522*	*1234 Paseo Del Mar*	*Los Angeles*	*90731*	*3/11/2014*

Required	= Required Field
Recommended	= Recommended

BUILDING																		
Building ID	Project Acreage (Acres)	Design Storm (in/24 hr)	Design Storm Volume (Gallons or MGD)	Units	Storm Volume Retained On-site (%)	85th % Storm Event (in/24 hr)	95th % Storm Event - Projects Draining to Natural Water Bodies (in/24 hr)	Type of BMP (Please select from list)	BMP Location (Lat/Long or Coordinates)	Contributing Area (Acres)	Design Volume for Treatment BMPs	Units	Offsite Run-on / Mitigation	Offsite Run-on Location	Design Storm Volume - Infiltrated at an Off-Site Mitigation Project (%)	Design Storm Volume - Retained or Treated with Biofiltration Off-Site (%)	Date of Maintenance Agreement	State WDID #
B14-0001	*18.943*	*0.920*	*473,200*	*Gallons*	*100%*	*0.920*	*None*	*(Bio)Infiltration Basins*	*34.012711, 118.271411*	*5.540*	-		*No*	*None*	*0.00%*	*0.00%*	*11/15/2014*	*4 19C123456*
								Permeable Pavement	*34.012311, 118.272411*	*3.400*	-				*0.00%*	*0.00%*		
								Water Harvesting	*34.012311, 118.271411*	*2.400*	-				*0.00%*	*0.00%*		
								Media Filtration Practices	*34.012511, 118.271411*	*2.103*	*6722*	*cf*			*0.00%*	*0.00%*		
								Wet Detention	*34.012811, 118.271811*	*5.500*	-				*0.00%*	*0.00%*		

CONSTRUCTION		POST-CONSTRUCTION BMP INSPECTIONS			
Acceptance Date	Certificate of Occupancy Date	Maintenance Records	Inspection Date and Summary	Replacement or Repair Date	Corrective Action
11/5/2016	*11/15/2016*	*Yes*	*11/21/2017*	*None*	*No*
		No	*11/21/2018 - No Records*	*Unknown*	*Yes*
		Yes	*11/21/2019*	*None*	*No*
		Yes	*11/21/2020*	*None*	*No*
		Yes	*11/21/2021*	*None*	*No*

Annual Assessment and Reporting requirements to be included in an Annual Report are outlined in Part XVIII.A.1 through A.7 of the MRP. With regard to New Development/Re-Development Effectiveness Tracking, the SMB JG7 WMP Group is required to annually track, analyze, and report on the following stormwater control measures in Part XVIII.A.1:

- Estimate the cumulative change in percent effective impervious area (EIA) since the effective date of the Permit and, if possible, the estimated change in the stormwater runoff volume during the 85th percentile storm event.
- Summarize new development/re-development projects constructed within the Permittee's jurisdictional area during the reporting year.
- Summarize retrofit projects that reduced or disconnected impervious area from the MS4 during the reporting year.
- Summarize other projects designed to intercept stormwater runoff prior to discharge to the MS4 during the reporting year.
- For the projects summarized above, estimate the total runoff volume retained onsite by the implemented projects.
- Summarize actions taken in compliance with TMDL implementation plans or approved Watershed Management Programs to implement TMDL provisions in Part VI.E and Attachments L-R of the Permit.
- Summarize riparian buffer/wetland restoration projects completed during the reporting year. For riparian buffers include width, length and vegetation type; for wetland include acres restored, enhanced, or created.
- Summarize other MCMs implemented during the reporting year, as deemed relevant.
- Provide status of all multi-year efforts that were not completed in the current year and will therefore continue into the subsequent year(s). Additionally, if any of the requested information cannot be obtained, then the Permittee shall provide a discussion of the factor(s) limiting its acquisition and steps that will be taken to improve future data collection efforts.

Group members are also required to track, evaluate, and provide an effectiveness assessment of stormwater control measures per Attachment E, Part XVIII.A.2:

- Summarize rainfall for the reporting year. Summarize the number of storm events, highest volume event (inches/24 hours), highest number of consecutive days with measureable rainfall, total rainfall during the reporting year compared to average annual rainfall for the subwatershed. Precipitation data may be obtained from the LACDPW rain gauge stations available at http://www.ladpw.org/wrd/precip/.
- Provide a summary table describing rainfall during stormwater outfall and wet-weather receiving water monitoring events. The summary description shall include the date, time that the storm commenced and the storm duration in hours, the highest 15-minute recorded storm intensity (converted to inches/hour), the total storm volume (inches), and the time between the storm event sampled and the end of the previous storm event.
- Where control measures were designed to reduce impervious cover or stormwater peak flow and flow duration, provide hydrographs or flow data of pre- and post-control activity for the 85th percentile, 24-hour rain event, if available.
- For natural drainage systems, develop a reference watershed flow duration curve and compare it to a flow duration curve for the subwatershed under current conditions.
- Provide an assessment as to whether the quality of stormwater discharges as measured at designed outfalls is improving, staying the same, or declining. The Permittee may compare water quality data from the reporting year to previous years with similar rainfall patterns, conduct

trends analysis, or use other means to develop and support its conclusions (e.g., use of non-stormwater action levels or municipal action levels as provided in Attachment G of the Permit).

- Provide an assessment as to whether wet-weather receiving water quality within the jurisdiction of the Permittee is improving, staying the same, or declining when normalized for variations in rainfall patterns. The Permittee may compare water quality data from the reporting year to previous years with similar rainfall patterns, conduct trends analysis, draw from regional bioassessment studies, or use other means to develop and support its conclusions.
- Provide status of all multi-year efforts, including TMDL implementation, that were not completed in the current year and will continue into the subsequent year(s). Additionally, if any of the requested information cannot be obtained, then the Permittee shall provide a discussion of the factor(s) limiting its acquisition and steps that will be taken to improve future data collection efforts.

Additional reporting elements required are identified in Part VI.D.7 of the Permit and include:

- A summary of total offsite project funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite projects.
- A list of mitigation project descriptions and estimated pollutant and flow reduction analyses.
- A comparison of the expected aggregate results of alternative compliance projects to the results that would otherwise have been achieved by retaining onsite the stormwater quality design volume.

Part XV.A of the MRP requires each Permittee or group to submit an Annual Report to the Regional Board by December 15th of each year. The annual reporting period is from July 1st through June 30th, and information reported will cover approved and constructed projects that have been issued occupancy.

6.4 SUMMARY OF NEW DEVELOPMENT/RE-DEVELOPMENT EFFECTIVENESS TRACKING

New Development/Re-Development Effectiveness Tracking is used for tracking information data in regards to new and re-development activities and their associated post-construction BMPs. The information is stored and will be submitted in an annual compliance report.

The City has developed mechanisms for tracking new development/re-development projects that have been conditioned for post-construction BMPs pursuant to MS4 Permit Part VI.D.7 The City has also developed mechanisms for tracking the effectiveness of these BMPs pursuant to MS4 Permit Attachment E.X.

Section 7
Regional Studies

As stated earlier, the MRP identifies one regional study: the SMC Regional Watershed Monitoring Program. The goal of the program is to conduct ongoing, large-scale regional monitoring on coastal streams and rivers. However, since there are no streams or rivers in the SMB JG7 WMP Group area, there are no SMC monitoring sites located in the WMP Group area.

Regardless, the City of Los Angeles and the LACFCD will continue to participate in the Regional Watershed Monitoring Program (Biosassessment Program) being managed by the Southern California Stormwater Monitoring Coalition (SMC). Initiated in 2008, the SMC's Regional Bioassement Program is designed to run over a five-year cycle. Monitoring under the first cycle concluded in 2013, with reporting of findings and additional special studies planned to occur in 2014. The SMC, including the SMB JG7 WMP Group agencies, is currently working on designing the bioassessment monitoring program for the next five-year cycle, which is scheduled to run from 2015 to 2019.

SCCWRP's Bight Regional Monitoring program is also expected to continue. Among other focuses, this program assesses the health of the Southern California Bight with respect to offshore water quality.

Section 8
Special Studies

The MRP requires each Permittee to be responsible for conducting special studies required in an effective TMDL or an approved TMDL Monitoring Plan. The effective TMDLs, revised TMDLs, and approved monitoring plans relevant to the SMB JG7 WMP Group do not require the completion of special studies. However, the SMB DDT and PCB TMDL has identified optional special studies as follows:

- Refine the relationship between sediment and concentrations of pollutants and fish tissue contamination;
- Determine total mass of DDT and PCBs in Santa Monica Bay subsurface sediments through sediment coring profiles;
- Identify flux rate of pollutants from the sediments to the water column; and
- Evaluate sediments embedded in storm drains to better estimate potential loadings of DDT and PCBs to Santa Monica Bay and identify potential sources.

At this time, the SMB JG7 WMP Group will not participate in any special studies. At a future date, if implementation of a special study is desirable, then a separate work plan that coordinates with the CIMP will be developed.

Section 9
Non-Direct Measurements

Existing monitoring programs that collect water quality data in the watershed, as identified in Section 2.1, will be incorporated into the CIMP database to the extent practicable. Gathering and compiling information from outside the CIMP programs will be dictated by the cost. Water quality data reported by these monitoring programs will be evaluated for suitability for inclusion in the CIMP database. If the water quality data is deemed to be suitable, then it will be included in the database.

Section 10
Adaptive Management

An adaptive management approach provides a structured process that allows for taking action under uncertain conditions based on the best available science, closely monitoring and evaluating outcomes, and re-evaluating and adjusting decisions as more information is obtained.

The WMP and CIMP are to be implemented using the adaptive process. As new program elements are implemented and data gathered over time, the WMP and CIMP will undergo revision to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP and CIMP will employ an adaptive management process that will allow the two programs to evolve over time.

10.1 INTEGRATED MONITORING AND ASSESSMENT PROGRAM

Part XVIII.A of the MRP details the annual assessment and reporting that is required as part of the annual report. The annual assessment and reporting is composed of seven parts:

1. Stormwater Control Measures
2. Effectiveness Assessment of Stormwater Control Measures
3. Non-stormwater Control Measures
4. Effectiveness Assessment of Non-stormwater Control Measures
5. Integrated Monitoring Compliance Report
6. Adaptive Management Strategies
7. Supporting Data and Information

Based on the findings of the annual assessment, revisions to the CIMP will be included as part of the Integrated Monitoring Compliance Report (IMCR), which is further outlined in **Section 11.2**, and submitted as part of the annual report.

10.2 CIMP REVISION PROCESS

Implementation of the CIMP will be used to gather data on receiving water conditions and stormwater/non-stormwater quality to assess water quality and the effectiveness of the WMP. As part of the adaptive management process, re-evaluation of the CIMP will need to be conducted to better inform the SMB JG7 WMP Group of ever-changing conditions of the watershed. Each program of the CIMP will be re-evaluated every two years, in line with the WMP's adaptive management process, for the following:

- **Monitoring Site Locations**: As water quality priorities change and certain WBPCs are being address or identified, monitoring site locations will either need to be added or changed.
- **Monitoring Constituents**: Eliminate or reduce monitoring of certain constituents if constituents were not initially detected during initiation of the CIMP and are not being addressed by a watershed control measure.
- **Monitoring Frequency**: Increase or decrease monitoring frequency based on the evaluation of RWL, WQBELs, and non-stormwater action levels.

Modifications to the monitoring program, specifically the elimination of parameters/constituents, may be proposed and will be subject to approval by the Executive Officer of the Regional Board. For all other modifications or adjustments (which by their nature need immediate action), Regional Board approval may not be necessary. Examples of this type of modifications include changing testing laboratories, moving sampling locations due to lack or absence of flow, etc. Is is assumed that the use of a scanned letter sent by email to the Regional Board will suffice as notification in these instances.

Section 11
Reporting

Analysis and reporting of data is an integral part of verifying whether the CIMP is meeting MRP objectives. The MRP, establishes NPDES permit monitoring, reporting, and recordkeeping requirements, including those for large MS4s, based on federal Clean Water Act (CWA) section 308(a) and Code of Federal Regulations (40 CFR) sections 122.26(d)(2)(i)(F), (iii)(D), 122.41(h)-(l), 122.42(c), and 122.48. In addition, California Water Code (CWC) section 13383 authorizes the Regional Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The following sections outline the CIMP reporting process for the SMB JG7 WMP Group.

11.1 DOCUMENTS AND RECORDS

Consistent with the Part XIV.A of the MRP requirements, the SMB JG7 WMP Group will retain records of all monitoring information for a period of at least 3 years from the date of the sample, measurement, report, or application, including:

- Calibration data;
- Major maintenance records;
- Original lab and field data sheets;
- Original strip chart recordings for continuous monitoring instrumentations;
- Copies of reports required by the permit; and
- Records of data used to complete the application for the permit.

Records of monitoring will include:

- Date, time of sampling or measurements, exact place, weather conditions, and rainfall amount;
- Individual(s) who performed the sampling or measurements;
- Date(s) analyses were performed;
- Individual(s) who performed the analyses;
- Analytical techniques or methods used;
- Results of such analyses; and
- Data sheets showing toxicity test results.

11.1.1 .Semi-Annual Data Submittal

Monitoring results data will be submitted semi-annually, as stated in Part XIV.L of the MRP. The transmitted data will be in the most recent update of the Southern California Municipal Storm Water Monitoring Coalition's (SMC) Standardized Data Transfer Formats (SDTFs) and sent electronically to the Regional Board Stormwater site to MS4stormwaterRB4@waterboards.ca.gov. The SMC SDTFs can be found at the SCCWRP web page http://www.sccwrp.org/data/DataSubmission.aspx. The submitted monitoring data will highlight exceedances of applicable WQBELs, receiving water limitations, action levels, and/or aquatic toxicity thresholds for all test results, with corresponding sampling dates per receiving water monitoring station.

11.1.2 Annual Monitoring Reports

Part XVIII.A.5, of the MRP presents the requirements of the IMCR that will be included and submitted on an annual basis as part of the Annual Report. As discussed in **Section 10**, the IMCR is one of seven parts of the Annual Assessment and Reporting.

The IMCR will include the following information as required by the MRP:

- Summary of exceedances against all applicable RWLs, WQBELs, non-stormwater action levels, and aquatic toxicity thresholds for:
  - Receiving water monitoring – Wet- and dry-weather
  - Stormwater outfall monitoring
  - Non-stormwater outfall monitoring
- Summary of actions taken:
  - To address exceedances for WQBELs, non-stormwater action levels, or aquatic toxicity for stormwater and non-stormwater outfall monitoring
  - To determine whether MS4 discharges contributed to RWL exceedances and efforts taken to control the discharge causing the exceedances to the receiving water
- If aquatic toxicity was confirmed and a TIE was conducted, then identify the toxic chemicals determined by the TIE, and include all relevant data to allow the Regional Board to review the adequacy and findings of the TIE.

The IMCR will be submitted, as part of the Annual Assessment Report section of the Annual Report, to the Regional Board by December 15th of each year covering the preceding reporting year from July 1 through June 30th, for at least the duration of the Permit term.

11.1.3 Signatory and Certification Requirements

Part V.B of Attachment D of the Permit presents the Signatory and Certification Requirements and states:

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or US Environmental Protection Agency (USEPA) shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below [40 CFR section 122.41(k)(1)].
2. All applications submitted to the Regional Water Board shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer includes: (i) the chief executive officer of the agency (e.g., Mayor), or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., City Manager, Director of Public Works, City Engineer, etc.).[40 CFR section 122.22(a)(3)].
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above [40 CFR section 122.22(b)(1)];
   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named

individual or any individual occupying a named position.) [40 CFR section 122.22(b)(2)]; and

c. The written authorization is submitted to the Regional Water Board [40 CFR section 122.22(b)(3)].

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR section 122.22(c)].
5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared 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 fine and imprisonment for knowing violations." [40 CFR section 122.22(d)].

All required signatures and statements will be included as an attachment of the Annual Report, which will be submitted to the Regional Board by December 15th of each year, for at least the duration of the Permit term.

Section 12
Schedule for CIMP Implementation

As stated in Part IV.C.6 of the MRP, the SMB JG7 WMP Group's CIMP will initiate 90 days after approval by the Executive Officer of the Regional Board. CIMP monitoring will be implemented in a phased-in approach to allow sufficient time for permitting and installation of equipment for all monitoring sites. Established TMDL monitoring programs, specifically the SMBBB TMDL 2004 approved CSMP, will continue without modification.

Section 13 References

California Department of Fish and Wildlife. Ecosystem Restoration Program, Adaptive Management https://www.dfg.ca.gov/erp/adaptive_management.asp. April 2014.

California Regional Water Quality Control Board, Los Angeles Region, *Order No. R4-2012-0175 NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating From The City of Long Beach MS4.* November 2012.

California Regional Water Quality Control Board, Los Angeles Region, *Santa Monica Bay Nearshore and Offshore Debris TMDL,* October 2010.

City of Los Angeles, Environmental Monitoring Division, *Santa Monica Bay Shoreline Monitoring Municipal Separate Storm Sewer System (MS4) Report (June 1, 2011 – May 30, 2012),* 2012.

Cowgill, U.M. and D.P. Milazzo. 1990. The sensitivity of two cladocerans to water quality variables, salinity and hardness. Arch. Hydrobiol. 120:185–196.

Kayhanian, M., C. Stransky, S. Bay, S. Lau, M.K. Stenstrom. 2008. Toxicity of urban highway runoff with respect to sorm duration. Science of the Total Environment 389:109-128

Lee, G. F. and A. Jones-Lee. "Review of the City of Stockton Urban Stormwater Runoff Aquatic Life Toxicity Studies Conducted by the CVRWQCB, DeltaKeeper and the University of California, Davis, Aquatic Toxicology Laboratory between 1994 and 2000," Report to the Central Valley Regional Water Quality Control Board, G. Fred Lee & Associates, El Macero, CA, October (2001).

Los Angeles RWQCB, *Attachment A to Resolution No. 2002-022 Final – 12/12/02 1 Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate Implementation Provisions for the Region's Bacteria Objectives and to incorporate the Santa Monica Bay Beaches Wet-Weather Bacteria TMDL*, 2002.

Los Angeles RWQCB, *Draft Santa Monica Bay Beaches Bacteria TMDL, Revised Staff Report (Dry Weather Only).* http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/2002-004/02_0114_tmdl%20Dry%20Weather%20Only_web.pdf, January 2002.

Los Angeles RWQCB, *Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 02-004*. http://63.199.216.6/larwqcb_new/bpa/docs/2002-004/2002-004_RB_BPA.pdf, 2002b.

Los Angeles RWQCB, *Water Quality in the Santa Monica Bay Watershed Under the Surface Water Ambient Monitoring Program Fiscal Year 2001-2002*, 2005.

Los Angeles RWQCB, *Proposed Amendments to the Water Quality Control Plan – Los Angeles Region for the Santa Monica Bay Nearshore and Offshore Debris TMDL. Attachment A to Resolution*

RB-AR16962

No. R10-010. Adopted November 4, 2010. http://63.199.216.6/larwqcb_new/bpa/docs/R10-010/R10-010_RB_BPA.pdf, November 2010.

Los Angeles RWQCB, *Water Quality Control Plan, Los Angeles Region.* http://www.waterboards.ca.gov/rwqcb4/ water_issues/programs/basin_plan/index.shtml, 1995, updated 2011.

Palumbo, A., Fojut, T., TenBrook, P. and Tjerdeema, R. 2010a. Water Quality Criteria Report for Diazinon. Prepared for the Central Valley Regional Water Quality Control Board by the Department of Environmental Toxicology, University of California, Davis. March.

Palumbo, A., Fojut, T., Brander, S., and Tjerdeema, R. 2010b. Water Quality Criteria Report for Bifenthrin. Prepared for the Central Valley Regional Water Quality Control Board by the Department of Environmental Toxicology, University of California, Davis. March.

Southern California Coastal Water Research Project, *Bight'13 Contaminant Impact Assessment Field Operations Manual - Appendix A*, 2013 http://www.sccwrp.org/Documents/BightDocuments/Bight13Documents/Bight13PlanningDocuments.aspx.

Technical Steering Committee of the City of Los Angeles and County of Los Angeles, Co-Chairs, *Santa Monica Bay Beaches Bacterial TMDLs Coordinated Shoreline Monitoring Plan*, 2004

United States Environmental Protection Agency (USEPA). 1991. Methods for Aquatic Toxicity Identification Evaluations: Phase I. Toxicity Characterization Procedures. 2nd Edition. EPA-600-6-91-003. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA), 1992a. NPDES Storm Water Sampling Guidance Document, EPA 833-B-92, 40 CFR 122.21 (g)(7)(ii).

United States Environmental Protection Agency (USEPA). 1992b. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. EPA/600/6-91/005F. May 1992. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1993a. Methods for Aquatic Toxicity Identification Evaluations- Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA-600-R-92-080. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1993b. Methods for Aquatic Toxicity Identification Evaluations- Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA-600-R-92-081. National Effluent Toxicity Assessment Center, Duluth, MN.

United States Environmental Protection Agency (USEPA). 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA-600-R-95-136. August.

U.S. Environmental Protection Agency (USEPA). 1996. Marine toxicity identification evaluation (TIE): Phase I guidance document. EPA/600/R-96/054. National Health and Environmental Effects Research Laboratory. Narragansett, RI.

U.S. Environmental Protection Agency (USEPA). 1996a. Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels. July 1996.

United States Environmental Protection Agency (USEPA). 2002a. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. October. EPA-821-R-02-013.

United States Environmental Protection Agency (USEPA). 2002b. Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. October. EPA-821-R-02-012.

United States Environmental Protection Agency (USEPA), Region 2, 2004, *Guidance for the Development of Quality Assurance Project Plans for Environmental Monitoring Projects*. April 12, 2004

United States Environmental Protection Agency (USEPA). 2007. Sediment toxicity identification evaluation (TIE) phases I, II, and III guidance document. EPA/600/R-07/080. U.S. Environmental Protection Agency, Office of Research and Development, Atlantic Ecology Division. Narragansett, RI.

United States Environmental Protection Agency (USEPA) 2009, New England, *Quality Assurance Project Plan Guidance for Environmental Projects Using Only Existing (Secondary) Data.* October 2009

United States Environmental Protection Agency (USEPA). 2010. National Pollutant Discharge Elimination System Test of Significant Toxicity Technical Document. EPA/833-R-10-004, U.S. Environmental Protection Agency, Office of Environmental Management, Washington, DC.

United States Environmental Protection Agency (USEPA), Region IX, 2013, *Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs.* March 2013

Wheelock, C., Miller, J., Miller, M., Gee, S., Shan, G. and Hammock, B. 2004. Development of Toxicity Identification Evaluation (TIE) procedures for pyrethroid detection using esterase activity. Environmental Toxicology and Chemistry 23:2699-2708

Attachment A

LACFCD Background Information

In 1915, the Los Angeles County Flood Control Act was adopted by the California State Legislature after a disastrous regional flood took a heavy toll on lives and property. The 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, protects existing vegetal covers, collects surface storm water from streets, and replenishes groundwater with storm water 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.**

By statute, the LACFCD has limited powers and purposes, which places constraints on the types of projects and activities which the LACFCD may fund. 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 Permit for inspecting and controlling pollutants from industrial and commercial facilities, development projects, and development construction sites. (Permit, Part II.E, p. 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."
(Permit, Part II.F**,** p. 18.)

Consistent with the role and responsibilities of the LACFCD under the Permit, the E]WMPs and 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.

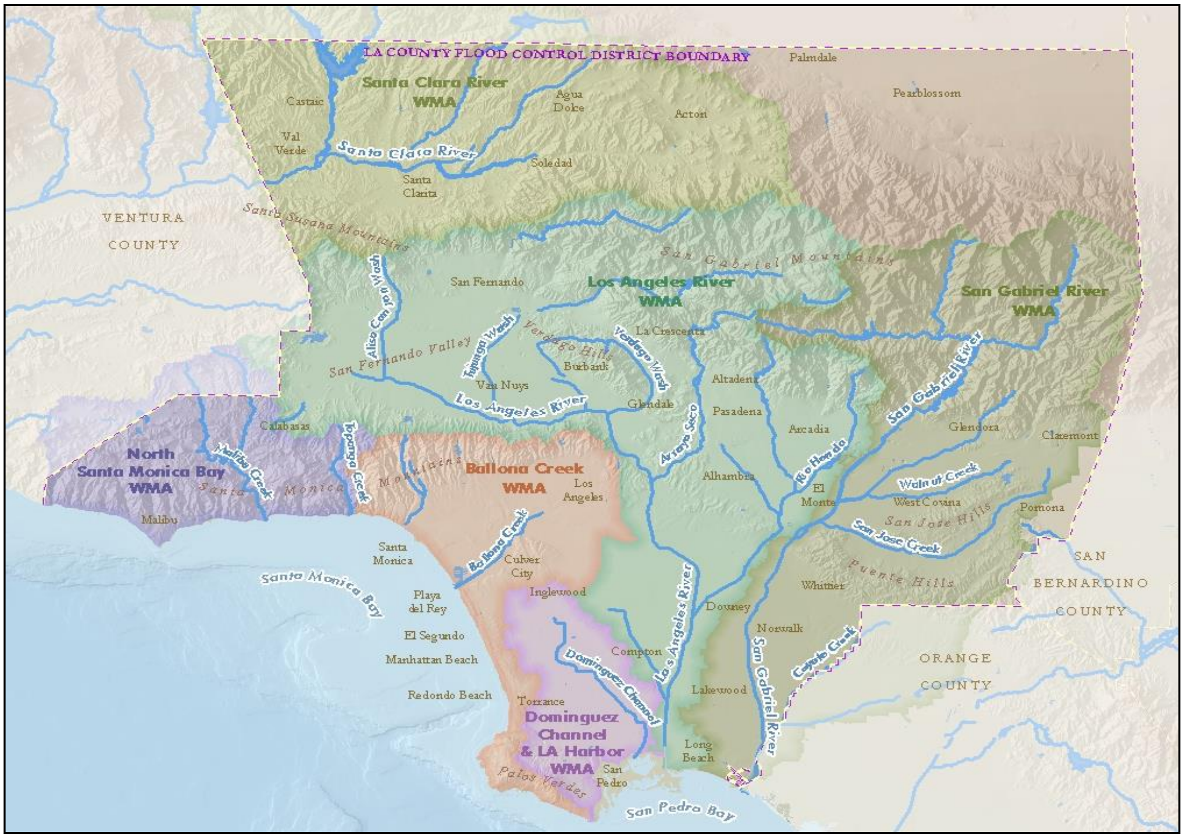


Figure A-1
Los Angeles County Flood Control District Service Area

Attachment B

Analytical and Monitoring Procedures

Section 1
Analytical Procedures

The sections below discuss the analytical procedures for data generated in the field and in the laboratory.

1.1 Field Parameters

Field meters will be calibrated in accordance to **Section 2.1.3**. Portable field meters will measure field parameters within specifications outlined in **Table B-1.**

Table B-1
Analytical Methods and Project Reporting Limits for Field Parameters

Parameter	Method	Range	Project RL
Current velocity/flow	Electromagnetic	-0.5 to +20 ft/s	0.05 ft/s
pH	Electrometric	0 – 14 pH units	NA
Temperature	High stability thermistor	-5 – 50 oC	NA
Dissolved oxygen	Membrane or Optical	0 – 50 mg/L	0.5 mg/L
Turbidity	Nephelometric	0 – 3000 NTU	0.2 NTU
Conductivity	Graphite electrodes	0 – 10 mmhos/cm	2.5 umhos/cm
Salinity	TBD	TBD	1 ppt

RL – Reporting Limit NA – Not applicable

1.2 Analytical Methods and Method Detection and Reporting Limits

Method detection limits (MDL) and reporting limits (RLs) must be distinguished for proper understanding and data use. The MDL is the minimum analyte concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. The RL represents the concentration of an analyte that can be routinely measured in the sampled matrix within stated limits and with confidence in both identification and quantitation.

Under this monitoring program, RLs must be verifiable by having the lowest non-zero calibration standard or calibration check sample concentration at or less than the RL. RLs have been established in this CIMP based on the verifiable levels and general measurement capabilities demonstrated for each method. These RLs should be considered as maximum allowable RLs to be used for laboratory data reporting. Note that samples diluted for analysis may have sample-specific RLs that exceed these RLs. This will be unavoidable on occasion. However, if samples are consistently diluted to overcome matrix interferences, the analytical laboratory will be required to notify the SMB JG7 WMP Group regarding how the sample preparation or test procedure in question will be modified to reduce matrix interferences so that project RLs can be met consistently.

Analytical methods and RLs required for samples analyzed in the laboratory are summarized in **Table B-2** for analysis in water. For organic constituents, environmentally relevant detection limits will be used to the extent practicable. The RLs listed in **Table B-2** are consistent with the requirements of the available minimum levels provided in the MRP, except for total dissolved solids, which was set equal to the minimum level identified in the California State Water Resources Control Board's Surface Water Ambient Monitoring Program's (SWAMP) Quality Assurance Project Plan. Alternative methods with

RLs that are at or below those presented in **Table B-2** are considered equivalent and can be used in place of the methods presented in **Table B-2** .

Prior to the analysis of any environmental samples, the laboratory must have demonstrated the ability to meet the minimum performance requirements for each analytical method presented in **Table B-2**. Depending on the laboratory selected for analysis, analytical methods may change, retaining the required minimum RL. The initial demonstration of capability includes the ability to meet the project RLs, the ability to generate acceptable precision and accuracy, and other analytical and quality control parameters documented in this CIMP. Data quality objectives for precision and accuracy are summarized in **Table B-3.**

Table B-2
Analytical Methods and Project Reporting Limits (RL) for Laboratory Analysis of Water Samples

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Toxicity				
Ceriodaphnia dubia (Freshwater)	EPA-821-R-02-013 (1002.0) and EPA-821-R-02-012 (2002.0)	TUc	2	NA
Strongylocentrotus purpuratus (marine waters)	EPA-600-R-95-136 (1002.0)	TUc	2	NA
Haliotis rufescens (marine waters)	EPA-600-R-95-136	TUc	2	NA
Bacteria				
Total coliform (marine waters)	SM 9221	MPN/100mL	10	10,000
Enterococcus (marine waters)	SM 9230	MPN/100mL	10	104
Fecal coliform (marine and fresh waters)	SM 9221	MPN/100mL	10	400
E. coli (fresh waters)	SM 9221	MPN/100mL	10	235
Conventional Pollutants				
Oil and Grease	EPA 1664A	mg/L	5	5
Cyanide	SM 4500-CN E	mg/L	0.005	0.005
General				

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Specific Conductance	EPA 120.1	µs/cm	1	1
Total Hardness	SM 2340C	mg/L	2	2
Dissolved Organic Carbon	SM 5310B	mg/L	0.6	NA
Total Organic Carbon	SM 5310B	mg/L	1	1
Total Petroleum Hydrocarbon	EPA 1664	mg/L	5	5
Biochemical Oxygen Demand	SMOL-5210	mg/L	5	2
Chemical Oxygen Demand	SM 5220D	mg/L	20	20-900
MBAS	SM 5540C	mg/L	0.5	0.5
Chloride	EPA 300.0	mg/L	1	2
Fluoride	EPA 300.0	mg/L	0.1	0.1
Perchlorate	EPA 314.0	µg/L	4	4
Dissolved Phosphorus	SM 4500-P E	mg/L	0.05	0.05
Total Phosphorus	SM 4500-P E	mg/L	0.05	0.05
Orthophosphate-P	EPA 300.0	mg/L	0.2	NA
Ammonia (as N)	SM 4500-NH3 C	mg/L	0.1	0.1
Nitrate + Nitrite (as N)	EPA 300.0	mg/L	0.1	0.1
Nitrate (as N)	EPA 300.0	mg/L	0.1	0.1
Nitrite (as N)	EPA 300.0	mg/L	0.1	0.1
Total Kjehdahl Nitrogen (TKN)	SM 4500-NH3 C	mg/L	0.1	0.1
Total Alkalinity	SM 2320B	mg/L	2	2
Solids				
Suspended Sediment Concentration (SSC)	ASTMD 3977-97	mg/L	3	NA
Total Suspended Solids	SM 2540D	mg/L	2	2

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
(TSS)				
Total Dissolved Solids (TDS)	SM 2540C	mg/L	10	2
Volatile Suspended Solids	EPA 1684	mg/L	1	2
Metals in Freshwater (dissolved and total)				
Aluminum	EPA 200.8	µg/L	100	100
Antimony	EPA 200.8	µg/L	0.5	0.5
Arsenic	EPA 200.8	µg/L	1	1
Beryllium	EPA 200.8	µg/L	0.5	0.5
Cadmium	EPA 200.8	µg/L	0.25	0.25
Chromium (total)	EPA 200.8	µg/L	0.5	0.5
Chromium (Hexavalent)	EPA 200.8	µg/L	5	5
Copper	EPA 200.8	µg/L	0.5	0.5
Iron	EPA 200.8	µg/L	100	100
Lead	EPA 200.8	µg/L	0.5	0.5
Mercury	EPA 1631	µg/L	0.5	0.5
Nickel	EPA 200.8	µg/L	1	1
Selenium	EPA 200.8	µg/L	1	1
Silver	EPA 200.8	µg/L	0.25	0.25
Thallium	EPA 200.8	µg/L	1	1
Zinc	EPA 200.8	µg/L	1	1
Metals in Seawater (dissolved and total)				

RB-AR16973

Parameter/Constituent	Method(1)	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Copper	EPA 1640	µg/L	1	NA
Lead	EPA 1640	µg/L	1	NA
Mercury	EPA 1631	µg/L	1	NA
Nickel	EPA 1640	µg/L	1	NA
Selenium	EPA 1640	µg/L	1	NA
Silver	EPA 1640	µg/L	1	NA
Zinc	EPA 1640	µg/L	1	NA
Organochlorine Pesticides (Repeat parameters will be tested by one method or another, not both)				
Aldrin	EPA 608	ng/L	5	5
alpha-BHC	EPA 608	ng/L	10	10
beta-BHC	EPA 608	ng/L	5	5
delta-BHC	EPA 608	ng/L	5	5
gamma-BHC (Lindane)	EPA 608	ng/L	20	20
Chlordane-alpha	EPA 608	ng/L	100	100
Chlordane-gamma	EPA 608	ng/L	100	100
Oxychlordane	EPA 608	ng/L	200	NA
Cis-nonachlor	EPA 608	ng/L	200	NA
Trans-nonachlor	EPA 608	ng/L	200	NA
2,4'-DDD	EPA 608	ng/L	2	NA
2,4'-DDE	EPA 608	ng/L	2	NA
2,4'-DDT	EPA 608	ng/L	2	NA
4,4’-DDD	EPA 608	ng/L	50	50
4,4’-DDE	EPA 608	ng/L	50	50
4,4’-DDT	EPA 608	ng/L	10	10
Dieldrin	EPA 608	ng/L	10	10
Endosulfan I	EPA 608	ng/L	20	20
Endosulfan II	EPA 608	ng/L	10	10

Parameter/Constituent	Method[(1)]	Units	Project	MRP Table E-2
			Reporting Limit	Minimum Level
Endosulfan Sulfate	EPA 608	ng/L	50	50
Endrin	EPA 608	ng/L	10	10
Endrin Aldehyde	EPA 608	ng/L	10	10
Heptachlor	EPA 608	ng/L	10	10
Heptachlor Epoxide	EPA 608	ng/L	10	10
Toxaphene	EPA 608	ng/L	500	500
Aldrin	EPA 1699	ng/L	0.006[3]	5
alpha-BHC	EPA 1699	ng/L	0.007[4]	10
beta-BHC	EPA 1699	ng/L	0.006[4]	5
delta-BHC	EPA 1699	ng/L	0.005[4]	5
gamma-BHC (Lindane)	EPA 1699	ng/L	0.009[4]	20
Chlordane-alpha	EPA 1699	ng/L	0.007[4]	100
Chlordane-gamma	EPA 1699	ng/L	0.006[4]	100
Oxychlordane	EPA 1699	ng/L	0.007[4]	NA
Cis-nonachlor	EPA 1699	ng/L	0.004[4]	NA
Trans-nonachlor	EPA 1699	ng/L	0.011[4]	NA
2,4'-DDD	EPA 1699	ng/L	0.003[4]	NA
2,4'-DDE	EPA 1699	ng/L	0.003[4]	NA
2,4'-DDT	EPA 1699	ng/L	0.002[4]	NA
4,4'-DDD	EPA 1699	ng/L	0.005[4]	50
4,4'-DDE	EPA 1699	ng/L	0.006[4]	50
4,4'-DDT	EPA 1699	ng/L	0.001[4]	10
Dieldrin	EPA 1699	ng/L	0.005[4]	10
Endosulfan I	EPA 1699	ng/L	0.024[4]	20

[3] RL assumed equal to MDL in Table 1 from EPA Method 1699

Parameter/Constituent	Method[1]	Units	Project	MRP Table E-2
			Reporting Limit	Minimum Level
Endosulfan II	EPA 1699	ng/L	0.030[4]	10
Endosulfan Sulfate	EPA 1699	ng/L	0.013[4]	50
Endrin	EPA 1699	ng/L	0.003[4]	10
Endrin Aldehyde	EPA 1699	ng/L	0.012[4]	10
Heptachlor	EPA 1699	ng/L	0.007[4]	10
Heptachlor Epoxide	EPA 1699	ng/L	0.012[4]	10
Toxaphene	EPA 1699	ng/L	Not reported	500
PCBs (Repeat parameters will be tested by one method or another, not both)				
Congeners (5, 8, 15, 18, 27, 28, 29, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, 105, 110, 114, 118, 128, 137, 138, 141, 149, 151, 153, 156, 157, 158, 170, 174, 177, 180, 183, 187, 194, 195, 200, 201, 203, 206, 209)	EPA 608[4]	µg/L	0.002	0.002[4]
Congener 189	EPA 608[4]	µg/L	1.0	1.0[4]
Congener 5	EPA 1668A	µg/L	0.00005	0.002[4]
Congeners (27, 29, 33, 56, 105, 141, 158)	EPA 1668A	µg/L	0.0002	0.002[4]

[4] Listed in the State of California's Surface Water Ambient Monitoring Program Quality Assurance Program Plan (September 1, 2008).

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Congeners (8, 15, 18, 28, 31, 44, 49, 52, 60, 66, 70, 74, 87, 95, 97, 99, 114, 118, 128, 138, 149, 151, 153, 156, 157, 170, 174, 177, 180, 187, 194, 209)	EPA 1668A	µg/L	0.0005	0.002[4]
Congener 189	EPA 1668A	µg/L	0.0005	1.0[4]
Congeners (101, 110, 137, 183, 195, 200, 201, 203, 206)	EPA 1668A	µg/L	0.001	0.002[4]
Aroclors (1016, 1221, 1232, 1242, 1248[5], 1254[6], 1260[6])	EPA 608	µg/L	0.5	0.5
Organophosphorus Pesticides (Repeat parameters will be tested by one method or another, not both)				
Chlorpyrifos	EPA 614	ng/L	50	50
Diazinon	EPA 614	ng/L	10	10
Malathion	EPA 614	ng/L	1000	1000
Triazine				
Atrazine	EPA 530	µg/L	2	2
Cyanazine	EPA 530	µg/L	2	2
Prometryn	EPA 530	µg/L	2	2
Simazine	EPA 530	µg/L	2	2

[5] Reporting limit in State of California's Surface Water Ambient Monitoring Program Quality Assurance Program Plan listed as 2.5 µg/L

[6] Reporting limit in State of California's Surface Water Ambient Monitoring Program Quality Assurance Program Plan listed as 1.0 µg/L

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Chlorpyrifos	EPA 1699	ng/L	0.020[4]	50
Diazinon	EPA 1699	ng/L	0.027[4]	10
Malathion	EPA 1699	ng/L	0.296[4]	1000
Triazine	EPA 1699			
Atrazine	EPA 1699	µg/L	0.000014[4]	2
Cyanazine	EPA 1699	µg/L	0.000038[4]	2
Prometryn	EPA 1699	µg/L	Not reported[4]	2
Simazine	EPA 1699	µg/L	0.000012[4]	2
Herbicides				
2,4-D	EPA 8151A	µg/L	10	10
Glyphosate	EPA 547	µg/L	5	5
2,4,5-TP-SILVEX	EPA 8151A	µg/L	0.5	0.5
Semivolatile Organic Compounds (SVOCs)				
1,2-Diphenylhydrazine	EPA 625	µg/L	1	1
2,4,6-Trichlorophenol	EPA 625	µg/L	10	10
2,4-Dichlorophenol	EPA 625	µg/L	1	1
2,4-Dimethylphenol	EPA 625	µg/L	2	2
2,4-Dinitrophenol	EPA 625	µg/L	5	5
2,4-Dinitrotoluene	EPA 625	µg/L	5	5
2,6-Dinitrotoluene	EPA 625	µg/L	5	5
2-Chloronaphthalene	EPA 625	µg/L	10	10
2-Chlorophenol	EPA 625	µg/L	2	2
2-Methyl-4,6-dinitrophenol	EPA 625	µg/L	5	5
2-Nitrophenol	EPA 625	µg/L	10	10
3,3'-Dichlorobenzidine	EPA 625	µg/L	5	5
4-Bromophenyl phenyl ether	EPA 625	µg/L	5	5
4-Chloro-3-methylphenol	EPA 625	µg/L	1	1

Parameter/Constituent	Method[1]	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
4-Chlorophenyl phenyl ether	EPA 625	µg/L	5	5
4-Nitrophenol	EPA 625	µg/L	5	5
Acenaphthene	EPA 625	µg/L	1	1
Acenaphthylene	EPA 625	µg/L	2	2
Anthracene	EPA 625	µg/L	2	2
Benzidine	EPA 625	µg/L	5	5
Benzo(a)anthracene	EPA 625	µg/L	5	5
Benzo(a)pyrene	EPA 625	µg/L	2	2
Benzo(b)fluoranthene	EPA 625	µg/L	10	10
Benzo(g,h,i)perylene	EPA 625	µg/L	5	5
Benzo(k)fluoranthene	EPA 625	µg/L	2	2
Benzyl butyl phthalate	EPA 625	µg/L	10	10
bis(2-Chloroethoxy) methane	EPA 625	µg/L	5	5
bis(2-Chloroisopropyl) ether	EPA 625	µg/L	2	2
bis(2-Chloroethyl) ether	EPA 625	µg/L	1	1
bis(2-Ethylhexyl) phthalate	EPA 625	µg/L	5	5
Chrysene	EPA 625	µg/L	5	5
Dibenzo(a,h)anthracene	EPA 625	µg/L	0.1	0.1
Diethyl phthalate	EPA 625	µg/L	2	2
Dimethyl phthalate	EPA 625	µg/L	2	2
Di-n-butylphthalate	EPA 625	µg/L	10	10
Di-n-octylphthalate	EPA 625	µg/L	10	10
Fluoranthene	EPA 625	µg/L	0.05	0.05
Fluorene	EPA 625	µg/L	0.1	0.1
Hexachlorobenzene	EPA 625	µg/L	1	1
Hexachlorobutadiene	EPA 625	µg/L	1	1
Hexachloro-cyclo pentadiene	EPA 625	µg/L	5	5

Parameter/Constituent	Method(1)	Units	Project Reporting Limit	MRP Table E-2 Minimum Level
Hexachloroethane	EPA 625	µg/L	1	1
Indeno(1,2,3-cd)pyrene	EPA 625	µg/L	0.05	0.05
Isophorone	EPA 625	µg/L	1	1
Naphthalene	EPA 625	µg/L	0.2	0.2
Nitrobenzene	EPA 625	µg/L	1	1
N-Nitroso-dimethyl amine	EPA 625	µg/L	5	5
N-Nitrosodiphenylamine	EPA 625	µg/L	1	1
N-Nitroso-di-n-propyl amine	EPA 625	µg/L	5	5
Pentachlorophenol	EPA 625	µg/L	2	2
Phenanthrene	EPA 625	µg/L	0.05	0.05
Total Phenols	EPA 625	mg/L	0.2	0.1
Phenol	EPA 625	µg/L	1	1
Pyrene	EPA 625	µg/L	0.05	0.05
Volatile Organic Compounds				
1,2,4-Trichlorobenzene	EPA 625	µg/L	1	1
1,2-Dichlorobenzene	EPA 625	µg/L	1	1
1,3-Dichlorobenzene	EPA 625	µg/L	1	1
1,4-Dichlorobenzene	EPA 625	µg/L	1	1
2-Chloroethyl vinyl ether	EPA 625	µg/L	1	1
Methyl tert-butyl ether (MTBE)	EPA 625	µg/L	1	1

RL – Reporting Limit NA – Not applicable

1. RLs are equal to those specified in the MRP of the Permit. Methods may be substituted by an equivalent method that is lower than or meets the project RL.

Table B-3
Data Quality Objectives

Parameter	Accuracy	Precision	Recovery	Completeness
Field Measurements				
Water Velocity (for Flow calc.)	2%	NA	NA	90%
pH	+ 0.2 pH units	+ 0.5 pH units	NA	90%
Temperature	+ 0.5 oC	+ 5%	NA	90%
Dissolved Oxygen	+ 0.5 mg/L	+ 10%	NA	90%
Conductivity	5%	5%	NA	90%
Laboratory Analyses – Water				
Conventionals and Solids	80 – 120%	0 – 25%	80 – 120%	90%
Aquatic Toxicity	(1)	(2)	NA	90%
Nutrients(3)	80 – 120%	0 – 25%	90 – 110%	90%
Metals(3)	75 – 125%	0 – 25%	75 – 125%	90%
Semi-Volatile Organics(3)	50 – 150%	0 – 25%	50 – 150%	90%
Volatile Organics(3)	50 – 150%	0 – 25%	50 – 150%	90%
Triazines(3)	50 – 150%	0 – 25%	50 – 150%	90%
Herbicides(3)	50 – 150%	0 – 25%	50 – 150%	90%
OC Pesticides(3)	50 – 150%	0 – 25%	50 – 150%	90%
PCB Congeners(3)	50 – 150%	0 – 25%	50 – 150%	90%
PCB Aroclors(3)	50 – 150%	0 – 25%	50 – 150%	90%
OP Pesticides(3)	50 – 150%	0 – 25%	50 – 150%	90%

1. Must meet all method Test Acceptibility Critera (TAC) relative to the reference toxicant test.
2. Must meet all method Test Acceptibility Critera (TAC) relative to sample replicates.
3. See **Error! Not a valid result for table.**,for a list of individual constituents in each suite for water.

1.2.1 Method Detection Limit Studies

Any laboratory performing analyses under this program must routinely conduct MDL studies to document that the MDLs are less than or equal to the project-specified RLs. If any analytes have MDLs that do not meet the project RLs, the following steps must be taken:

- Perform a new MDL study using concentrations sufficient to prove analyte quantitation at concentrations less than or equal to the project-specified RLs per the procedure for the Determination of the Method Detection Limit presented in Revision 1.1, 40 Code of Federal Regulations (CFR) 136, 1984.
- No samples may be analyzed until the issue has been resolved. MDL study results must be available for review during audits, data review, or as requested. Current MDL study results must be reported for review and inclusion in project files.

An MDL is developed from seven aliquots of a standard containing all analytes of interest spiked at five times the expected MDL. These aliquots are processed and analyzed in the same manner as environmental samples. The results are then used to calculate the MDL. If the calculated MDL is less than 0.33 times the spiked concentration, another MDL study should be performed using lower spiked concentrations.

1.2.2 Project Reporting Limits

Laboratories generally establish RLs that are reported with the analytical results—these may be called reporting limits, detection limits, reporting detection limits, or several other terms by the reporting laboratory. These laboratory limits must be less than or equal to the project RLs listed in **Table B-2.** Wherever possible, project RLs are lower than the relevant numeric criteria or toxicity thresholds. Laboratories performing analyses for this project must have documentation to support quantitation at the required levels.

1.2.3 Laboratory Standards and Reagents

All stock standards and reagents used for standard solutions and extractions must be tracked through the laboratory. The preparation and use of all working standards must be documented according to procedures outlined in each laboratory's Quality Assurance (QA) Manual; standards must be traceable according to USEPA, A2LA or National Institute for Standards and Technology (NIST) criteria. Records must have sufficient detail to allow determination of the identity, concentration, and viability of the standards, including any mixings performed to obtain the working standard. Date of preparation, analyte or mixture, concentration, name of preparer, lot or cylinder number, and expiration date, if applicable, must be recorded on each working standard.

1.2.4 Sample Containers, Storage, Preservation, and Holding Times

Sample containers must be pre-cleaned and certified free of contamination according to the USEPA specification for the appropriate methods. Sample container, storage and preservation, and holding time requirements are provided in **Table B-4**.These values may vary based on the selected laboratory. The analytical laboratories will supply sample containers that already contain preservative (**Table B-4**), including ultra-pure hydrochloric and nitric acid, where applicable. After collection, samples will be stored at 4°C until arrival at the contract laboratory.

Table B-4
Sample Container, Sample Volume, Initial Preservation, and Holding Time Requirements for Parameters Analyzed at a Laboratory

Parameter	Sample Container	Sample Volume(1)	Immediate Processing and Storage	Holding Time
Water				
Toxicity				
Initial Screening	Glass or FLPE-lined jerrican	40 L(6)	Store at 4°C	36 hours(2)
Follow-Up Testing				
Phase I TIE				
Total coliform, fecal coliform, and Enterococcus (marine waters)	PE	120 mL	Na2S2O3 and Store at 8ºC	6 hours
Fecal coliform, *E. coli* (fresh waters)	PE	120 mL		

Parameter	Sample Container	Sample Volume[1]	Immediate Processing and Storage	Holding Time
Oil and Grease	PE	250 mL	HCl and Store at 4°C	28 days
Cyanide	PE	1 L	NaOH and Store at 4°C	14 days
Dissolved Organic Carbon (DOC)	PE	250 mL	Store at 4°C	Filter/28 days
Total Organic Carbon (TOC)	PE	250 mL	H_2SO_4 and Store at 4°C	28 days
Total Petroleum Hydrocarbon	Glass	1 L	HCl or H_2SO_4 and Store at 4°C	7/40 days[3]
Biochemical Oxygen Demand	PE	1L	Store at 4°C	48 hours
Chemical Oxygen Demand	PE	500 mL	H_2SO_4 and Store at 4°C	28 days
MBAS	PE	1 L	Store at 4°C	48 hours
Fluoride	PE	500 mL	None required	28 days
Chloride	PE	250 mL	Store at 4°C	28 days
Perchlorate	PE	500 mL	Store at 4°C	28 days
Nitrate Nitrogen	PE	250 mL	Store at 4°C	48 hours
Nitrite Nitrogen				
Orthophosphate-P				
Ammonia Nitrogen	Glass	250-mL	H_2SO_4 and Store at 4°C	28 days
Total and Dissolved Phosphorus				
Organic Nitrogen				
Nitrate + Nitrite (as N)				
Total Kjehdahl Nitrogen (TKN)	PE	250 mL	H_2SO_4 and Store at 4°C	28 days
Total Alkalinity	PE	500 mL	Store at 4°C	14 days
Suspended Sediment Concentration (SSC)	PE	250 mL	Store at 4°C	120 days
Total Suspended Solids (TSS)	PE	250 mL	Store at 4°C	7 days
Total Dissolved Solids (TDS)	PE	250 mL	Store at 4°C	7 days
Volatile Suspended Solids	PE	250 mL	Store at 4°C	7 days
Hardness	PE	500 mL	Store at 4°C	180 days
Metals				6 months[4]
Mercury	Glass	500 mL	Store at 4°C	48 Hours
PCBs, OC Pesticides, OP Pesticides, Triazine Pesticides	Amber glass	4 x 1 L	Store at 4°C	7/40 days[3]
Suspended Solids Analysis for Organics and Metals	Amber glass	20 x 1 L	Store at 4°C	1 year[5]
Herbicides	Glass	2 x 40 mL	Thiosulfate and	14 days

Parameter	Sample Container	Sample Volume(1)	Immediate Processing and Storage	Holding Time
			Store at 4°C	
Semivolatile Organic Compounds	Glass	2 x 1 L	Store at 4°C	7 days
Volatile Organic Compounds	VOA	3 x 40 mL	HCl and Store at 4°C	14 days

PE – Polyethylene

1. Additional volume may be required for QC analyses.
2. Tests should be initiated within 36 hours of collection. The 36-hour hold time does not apply to subsequent analyses for TIEs. For interpretation of toxicity results, samples may be split from toxicity samples in the laboratory and analyzed for specific chemical parameters. All other sampling requirements for these samples are as specified in this document for the specific analytical method. Results of these analyses are not for any other use (e.g., characterization of ambient conditions) because of potential holding time exceedances and variance from sampling requirements.
3. 7/40 = 7 days to extract and 40 days from extraction to analysis.
4. 6 months after preservation.
5. One year if frozen, otherwise 14 days to extract and 40 days from extraction to analysis.
6. Sample volumes for follow-up testing and Phase I TIEs for sediments may change based on percent solids in previous samples. In addition, collection of sediment for follow-up testing and Phase I TIEs may change based on observations of toxicity in previous sampling events.

1.3 Aquatic Toxicity Testing and Toxicity Identification Evaluations

Aquatic toxicity testing supports the identification of BMPs to address sources of toxicity in urban runoff. Monitoring begins in the receiving water and the information gained is used to identify constituents for monitoring at outfalls to support the identification of pollutants that need to be addressed in the WMP. The sub-sections below describe the detailed process for conducting SMB J7 aquatic toxicity monitoring, evaluating results, and the technical and logistical rationale. Control measures and management actions to address confirmed toxicity caused by urban runoff are addressed by the WMP, either via currently identified management actions or those that are identified via adaptive management of the WMP.

1.3.1 Sensitive Species Selection

The MRP (page E-32) states that a sensitivity screening to select the most sensitive test species should be conducted unless “a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring shall be conducted using only that test species.” Previous relevant studies conducted in the watershed should be considered. Such studies may have been completed via previous MS4 sampling, wastewater NPDES sampling, or special studies conducted within the watershed. The following sub-sections discuss the species selection process for assessing aquatic toxicity in receiving waters.

1.3.1.1 *Freshwater Sensitive Species Selection*

As described in the MRP (page E-31), if samples are collected in receiving waters with salinity less than 1 part per thousand (ppt), or from outfalls discharging to receiving waters with salinity less than 1 ppt, toxicity tests should be conducted on the most sensitive test species in accordance with species and short-term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). Static renewal freshwater toxicity test species identified in the MRP are:

- Fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method).
- Daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method).
- Static non-renewal Green alga, *Selenastrum capricornutum* (Growth Inhibition Test Method).

The three test species were evaluated to determine if either a sensitive test species had already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s). In reviewing the available data in the ULAR watershed, metals, historical organics, and currently used pesticides have been identified as problematic and are generally considered the primary aquatic life toxicants of concern found in urban runoff. Given the knowledge of the presence of these potential toxicants in the watershed, the sensitivities of each of the three species were considered to evaluate which is the most sensitive to the potential toxicants in the watershed.

Ceriodaphnia dubia (*C. dubia*) has been reported as a sensitive test species for historical and current use pesticides and metals, and studies indicate that it is more sensitive to the toxicants of concern than *Pimephales promelas* (*P. promelas*) or *Selenastrum capricornutum* (*S. capricornutum*). In *Aquatic Life Ambient Freshwater Quality Criteria - Copper*, the USEPA reports greater sensitivity of *C. dubia* to copper (species mean acute value of 5.93 µg/l) compared to *P. promelas* (species mean acute value of 69.93 µg/l; EPA, 2007). *C. dubia*'s relatively higher sensitivity to metals is common across multiple metals. Additionally, researchers at the University of California (UC), Davis reviewed available reported species sensitivity values in developing pesticide criteria for the Central Valley Regional Water Quality Control Board (CVRWQCB). The UC Davis researchers reported higher sensitivity of *C. dubia* to diazinon and bifenthrin (species mean acute value of 0.34 µg/l and 0.105 µg/l) compared to *P. promelas* (species mean acute value of 7804 µg/l and 0.405 µg/l; Palumbo et al., 2010a,b). Additionally, a study of the City of Stockton urban stormwater runoff found acute and chronic toxicity response to *C. dubia*, with no toxicity response to *S. capricornutum* or *P. promelas* (Lee and Lee, 2001). The toxicity was attributed to organophosphate pesticides, indicating a higher sensitivity of *C. dubia* compared to *S. capricornutum* or *P. promelas*. *C. dubia* is also the test organism selected to assess the ambient toxicity of the Los Angeles River by the Los Angeles River Watershed Monitoring Program and has been the most-sensitive species to the Donald C. Tillman and the Los Angeles-Glendale Water Reclamation Plant effluent as well as the Los Angeles River receiving water in the vicinity of the water treatment plants. While *P. promelas* is generally less sensitive to metals and pesticides, this species can be more sensitive to ammonia than *C. dubia*. However, as ammonia is not typically a constituent of concern for urban runoff and ammonia is not consistently observed above the toxic thresholds in the watershed, *P. promelas* is not considered a particularly sensitive species for evaluating the impacts of urban runoff in receiving waters in this watershed.

S. capricornutum is a species sensitive to herbicides. However, while sometimes present in urban runoff, herbicides are not identified as a potential toxicant in this watershed. Additionally, *S. capricornutum* is not considered the most sensitive species as it is not sensitive to pyrethroids or organophosphate pesticides and is not as sensitive to metals as *C. dubia*. Additionally, the *S. capricornutum* growth test can be affected by high concentrations of suspended and dissolved solids, color, and pH extremes, which can interfere with the determination of sample toxicity. As a result, it is common to manipulate the sample by centrifugation and filtration to remove solids to conduct the test; however, this process may affect the toxicity of the sample. In a study of urban highway stormwater runoff (Kayhanian et. al, 2008), *S. capricornutum's* response to the stormwater samples was more variable than the *C. dubia* and the *P. promelas* and in some cases the algal growth was possibly enhanced due to the presence of stimulatory nutrients. Also, in a study on the City of Stockton urban stormwater runoff (Lee and Lee, 2001) the *S. capricornutum* tests rarely detected toxicity where the *C. dubia* and the *P. promelas* regularly detected toxicity.

As *C. dubia* is identified as the most sensitive to known potential toxicant(s) typically found in receiving waters and urban runoff in the freshwater potions of this watershed, *C. dubia* is selected as the most sensitive species. The species also has the advantage of being easily maintained by means of in-house mass cultures. The relative ease of test preparation, the ease of interpreting results, and the smaller volume necessary to run the test, make the test a valuable screening tool. The ease of sample collection and higher sensitivity will support assessing the presence of ambient receiving water toxicity or long term effects of toxic stormwater over time. As such, toxicity testing in the freshwater portions of the watershed will be conducted using *C. dubia*. However, *C. dubia* test organisms are typically cultured in moderately hard waters (80-100 mg/L CaCO3) and can have increased sensitivity to elevated water hardness greater than 400 mg/L CaCO3), which is beyond their typical habitat range. Because of this, in instances where hardness in site waters exceeds 400 mg/L (CaCO3), an alternative test species may be used. *Daphnia magna* is more tolerant to high hardness levels and is a suitable substitution for *C. dubia* in these instances (Cowgill and Milazzo, 1990)

1.3.2 Testing Period

The following describes the testing periods to assess toxicity in samples collected in the ULARWMAG EWMP area during dry and wet weather conditions. Although wet weather conditions in the region generally persist for less than the chronic testing periods (7 days), the *C. dubia* chronic test will be used for wet weather toxicity testing in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA, 2002b). Utilization of chronic tests on wet weather samples are not expected to generate results representative of the typical conditions found in the receiving water intended to be simulated by toxicity testing.

Chronic toxicity tests will be used to assess both survival and reproductive/growth endpoints for *C. dubia* in dry weather samples. Chronic testing will be conducted on undiluted grab samples in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (USEPA, 2002a).

1.3.3 Toxicity Endpoint Assessment and Toxicity Identification Evaluation Triggers

Per the MRP, toxicity test endpoints will be analyzed using the Test of Significant Toxicity (TST) t-test approach specified by the USEPA (USEPA, 2010). The Permit specifies that the chronic in-stream waste concentration (IWC) is set at 100% receiving water for receiving water samples and 100% effluent for outfall samples. Using the TST approach, a t-value is calculated for a test result and compared with a critical t-value from USEPA's TST Implementation Document (USEPA, 2010). Follow-up triggers are generally based on the Permit specified statistical assessment as described below.

For chronic *C. dubia* toxicity testing, if a ≥50% reduction in survival or reproduction is observed between the sample and laboratory control that is statistically significant, a toxicity identification evaluation (TIE) will be performed.

TIE procedures will be initiated as soon as possible after the toxicity trigger threshold is observed to reduce the potential for loss of toxicity due to extended sample storage. If the cause of toxicity is readily apparent or is caused by pathogen related mortality (PRM) or epibiont interference with the test, the result will be rejected. If necessary, a modified testing procedure will be developed for future testing.

In cases where significant endpoint toxicity effects ≥50% are observed in the original sample, but the follow-up TIE baseline "signal" is not statistically significant, the cause of toxicity will be considered non-persistent. No immediate follow-up testing is required on the sample. However, future test results should be evaluated to determine if parallel TIE treatments are necessary to provide an opportunity to identify the cause of toxicity.

1.3.4 Toxicity Identification Evaluation Approach

The results of toxicity testing will be used to trigger further investigations to determine the cause of observed laboratory toxicity. The primary purpose of conducting TIEs is to support the identification of management actions that will result in the removal of pollutants causing toxicity in receiving waters. Successful TIEs will direct monitoring at outfall sampling sites to inform management actions. As such, the goal of conducting TIEs is to identify pollutant(s) that should be sampled during outfall monitoring so that management actions can be identified to address the pollutant(s).

The TIE approach is divided into three phases as described in USEPA's 1991 Methods for Aquatic Toxicity Identification Evaluations – Phase I Toxicity Characterization Procedures – Second Edition (EPA/600/6-9/003) and briefly summarized as follows:

- Phase I utilizes methods to characterize the physical/chemical nature of the constituents which cause toxicity. Such characteristics as solubility, volatility and filterability are determined without specifically identifying the toxicants. Phase I results are intended as a first step in specifically identifying the toxicants but the data generated can also be used to develop treatment methods to remove toxicity without specific identification of the toxicants.
- Phase II utilizes methods to specifically identify toxicants.
- Phase III utilizes methods to confirm the suspected toxicants.

A Phase I TIE will be conducted on samples that exceed a TIE trigger described above. Water quality data will be reviewed to further support evaluation of potential toxicants. A range of sample manipulations may be conducted as part of the TIE process. The most common manipulations are described in **Table B-5**. Information from previous chemical testing and/or TIE efforts will be used to determine which of these (or other) sample manipulations are most likely to provide useful information for identification of primary toxicants. TIE methods will generally adhere to USEPA procedures documented in conducting TIEs (USEPA, 1991, 1992, 1993a-b).

Table B-5
Aquatic Toxicity Identification Evaluation Sample Manipulations

TIE Sample Manipulation	Expected Response
Adjust to between pH 7 and 8.5	Alters toxicity in pH sensitive compounds (i.e., ammonia and some trace metals)
Filtration or centrifugation*	Removes particulates and associated toxicants
Ethylenediamine-Tetraacetic Acid (EDTA) or Cation Exchange Column*	Chelates trace metals, particularly divalent cationic metals
Sodium thiosulfate (STS) addition	Reduces toxicants attributable to oxidants (i.e., chlorine) and some trace metals
Piperonyl Butoxide (PBO)*	Reduces toxicity from organophosphate pesticides such as diazinon, chlorpyrifos and malathion, and enhances pyrethroid toxicity
Carboxylesterase addition(1)	Hydrolyzes pyrethroids
Temperature adjustments(2)	Pyrethroids become more toxic when test temperatures are decreased
Solid Phase Extraction (SPE) with C18 column*	Removes non-polar organics (including pesticides) and some relatively non-polar metal chelates
Sequential Solvent Extraction of C18 column	Further resolution of SPE-extracted compounds for chemical analyses
No Manipulation*	Baseline test for comparing the relative effectiveness of other manipulations

* Denotes treatments that will be conducted during the initiation of toxicity monitoring, but may be revised as the program is implemented. These treatments were recommended for initial stormwater testing in Appendix E (Toxicity Testing Tool for Storm Water Discharges) of the State Water Resources Control Board's June 2012 Public Review Draft "Policy for Toxicity Assessment and Control".

1. Carboxylesterase addition has been used in recent studies to help identify pyrethroid-associated toxicity (Wheelock et al., 2004; Weston and Amweg, 2007). However, this treatment is experimental in nature and should be used along with other pyrethroid-targeted TIE treatments (e.g., PBO addition).
2. Temperature adjustments are another recent manipulation used to evaluate pyrethroid-associated toxicity. Lower temperatures increase the lethality of pyrethroid pesticides. (Harwood, You and Lydy, 2009)

Toxicity causation will be tentatively identified based on the treatments in **Table B-5** and, when possible, the results verified based on water column chemistry analyses. After an initial determination of the cause of toxicity, the information may be used during future events to to modify the targeted treatments to more closely target the expected toxicant or to provide additional treatments to narrow the toxicant cause(s). Moreover, if the toxicant or toxicant class is not initially identified, toxicity monitoring during subsequent events will confirm if the toxicant is persistent or a short-term episodic occurrence.

As the primary goal of conducting TIEs is to identify pollutants for incorporation into outfall monitoring, narrowing the list of toxicants following Phase I TIEs via Phase II or III TIEs is not necessary if the toxicant class determined during the Phase I TIE is sufficient for: (1) identifying additional pollutants for outfall monitoring; and/or (2) identifying control measures. Thus, if the specific pollutant(s) or the analytical class of pollutant(s) (e.g., metals that are analyzed via USEPA Method 200.8) are identified then sufficient information is available to inform the addition of pollutants to outfall monitoring.

Phase II TIEs may be utilized to identify specific constituents causing toxicity in a given sample if the results of Phase I TIE testing and a review of available chemistry data fails to provide information necessary to identify constituents that warrant additional monitoring activities or management actions to identify likely sources of the toxicants and lead to elimination of the sources of these contaminants. Phase III TIEs will be conducted following any Phase II TIEs.

For the purposes of determining whether a TIE is inconclusive, TIEs will be considered inconclusive if:

- The toxicity is persistent (i.e., observed in the baseline), and
- The cause of toxicity cannot be attributed to a class of constituents (e.g., insecticides, metals, etc.) that can be targeted for monitoring.

If (1) a combination of causes that act in a synergistic or additive manner are identified; (2) the toxicity can be removed with a treatment or via a combination of the TIE treatments; or (3) the analysis of water quality data collected during the same event identify the pollutant or analytical class of pollutants, the result of a TIE is considered conclusive.

In cases where significant endpoint toxicity effects greater than 50% are observed in the original sample, but the follow-up TIE baseline "signal" is not statistically significant, the cause of toxicity will be considered non-persistent. No immediate follow-up testing is required on the sample. However, future test results should be evaluated to determine if parallel TIE treatments are necessary to provide an opportunity to identify the cause of toxicity.

Note that the MRP (page E-33) allows a TIE Prioritization Metric (as described in Appendix E of the Southern California Stormwater Monitoring Coalition's (SMC) Model Monitoring Program) for use in ranking sites for TIEs. However, as the extent to which TIEs will be conducted is unknown, prioritization cannot be conducted at this time. However, prioritization may be utilized in the future based on the results of toxicity monitoring and an approach to prioritization will be developed through the CIMP adaptive management process and will be described in future versions of the CIMP.

1.3.5 Follow Up on Toxicity Testing Results

If the results of two TIEs on separate receiving samples collected during the same condition (i.e., wet or dry weather) are inconclusive, a toxicity test conducted during the same condition (i.e., wet or dry weather), using the same test species, will be conducted at applicable upstream outfalls as soon as feasible (i.e., the next monitoring event that is at least 45 days following the toxicity laboratory's report transmitting the results of a inconclusive TIE). The same TIE evaluation triggers and TIE approach presented in Sections **Error! Reference source not found.** and **Error! Reference source not found.**, respectively will be followed based on the results of the outfall sample.

If a toxicant or class of toxicants is identified through a TIE, the MRP (page E-33) indicates the following actions should be taken:

- ULARWMAG Members shall analyze for the toxicant(s) during the next scheduled sampling event in the discharge from the outfall(s) upstream of the receiving water location.
- If the toxicant is present in the discharge from the outfall at levels above the applicable receiving water limitation, a toxicity reduction evaluation (TRE) will be performed for that toxicant.

The list of constituents monitored at outfalls identified in the CIMP will be modified based on the results of the TIEs. Monitoring for constituents identified based on the results of a TIE will occur as soon as feasible following the completion of a successful TIE (i.e., the next monitoring event that is at least 45 days following the toxicity laboratory's report transmitting the results of a successful TIE).

The requirements of the TREs will be met as part of the adaptive management process in the ULAR EWMP rather than conducted via the CIMP. The identification and implementation of control measures to address the causes of toxicity are tied to management of the stormwater program, not the CIMP. It is expected that the requirements of TREs will only be conducted for toxicants that are not already addressed by an existing Permit requirement (i.e., TMDLs) or existing or planned management actions.

1.3.6 Summary of Aquatic Toxicity Monitoring

The approach to conducting aquatic toxicity monitoring as described in the previous sections of this Attachment is summarized in **Figure B-1**. The intent of the approach is to identify the cause of toxicity observed in receiving water to the extent possible with the toxicity testing tools available, thereby directing outfall monitoring for the pollutants causing toxicity with the ultimate goal of supporting the development and implementation of management actions.

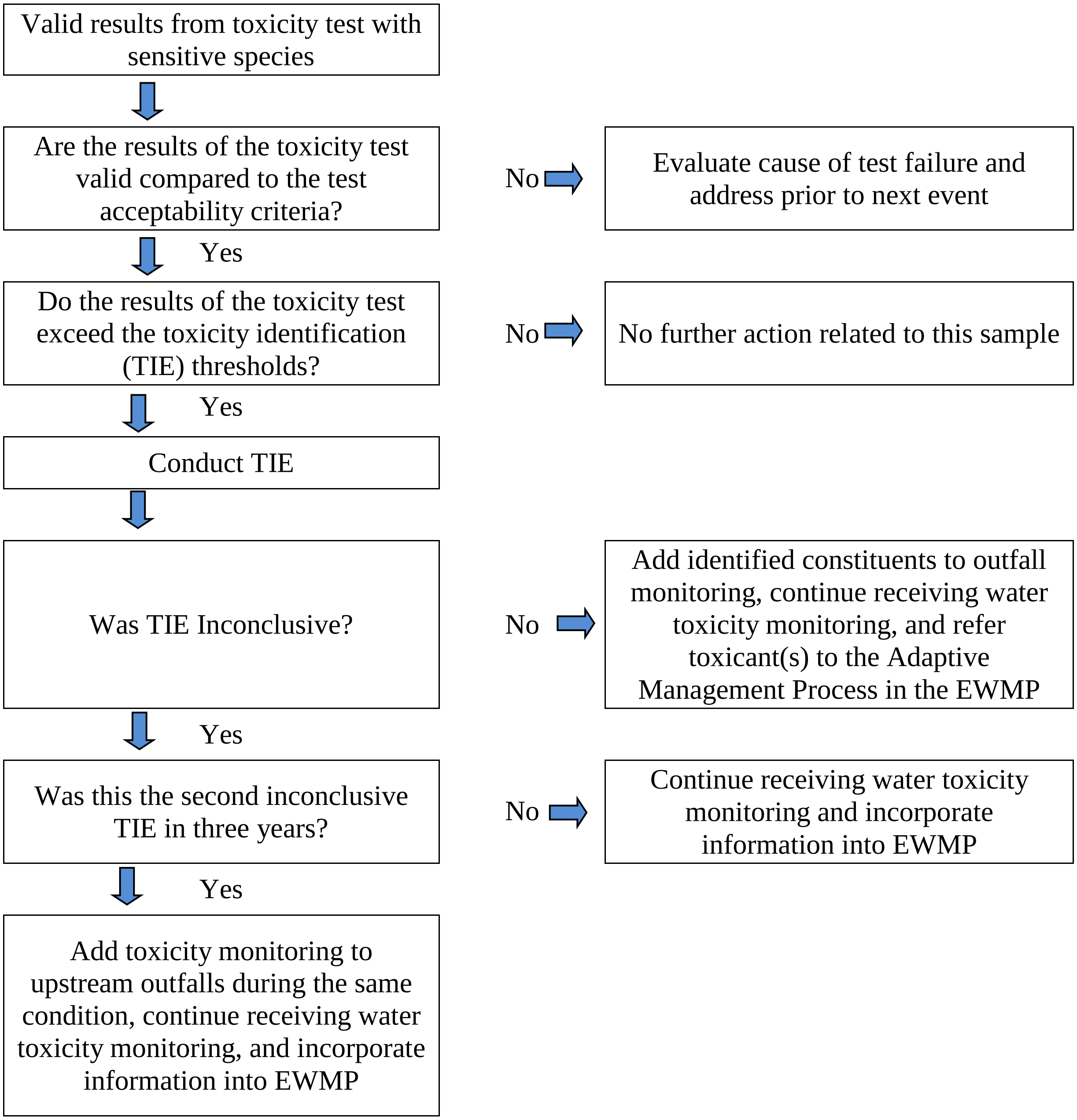


Figure B-1. Detailed Aquatic Toxicity Assessment Process

Section 2
Sampling Methods and Sample Handling

The sections below discuss the steps to be taken to properly prepare for and initiate water quality sampling for the CIMP.

2.1 Monitoring Event Preparation

Monitoring event preparation includes preparation of field equipment, placing bottle orders, and contacting the necessary personnel regarding site access and schedule. The following steps will be completed two weeks prior to each sampling event (a condensed timeline may be appropriate in storm events, which may need to be completed on short notice):

1. Contact laboratories to order sample containers and to coordinate sample transportation details.
2. Confirm scheduled monitoring date with field crew(s), and set-up sampling day itinerary including sample drop-off.
3. Prepare equipment.
4. Prepare sample container labels and apply to bottles.
5. Prepare the monitoring event summary and field log sheets to indicate the type of field measurements, field observations and samples to be collected at each of the monitoring sites.
6. Verify that field measurement equipment is operating properly (i.e., check batteries, calibrate, etc.)

Table B-6 provides a checklist of field equipment to prepare prior to each monitoring event.

Table B-6
Field Equipment Checklist

☐	Monitoring Plan
☐	Sample Containers plus Extras with Extra Lids
☐	Pre-Printed, Waterproof Labels (extra blank sheets)
☐	Event Summary Sheets
☐	Field Log Sheets
☐	Chain of Custody Forms
☐	Bubble Wrap
☐	Coolers with Ice
☐	Tape Measure
☐	Paper Towels or “Rags in a Box”
☐	Safety Equipment
☐	First Aid Kit
☐	Cellular Telephone
☐	Gate Keys
☐	Hip Waders
☐	Plastic Trash Bags
☐	Sealable Plastic Bags
☐	Grab Pole
☐	Clean Secondary Container(s)
☐	Field Measurement Equipment
☐	New Powder-Free Nitrile Gloves
☐	Writing Utensils
☐	Stop Watch
☐	Camera
☐	Blank Water

2.1.1 Bottle Order/Preparation

Sample container orders will be placed with the appropriate analytical laboratory at least two weeks prior to each sampling event. Containers will be ordered for all water samples, including quality control samples, as well as extra containers in case the need arises for intermediate containers or a replacement. The containers must be the proper type and size and contain preservative as appropriate for the specified laboratory analytical methods.

Table B-4 presents the proper container type, volume, and immediate processing and storage needs. The field crew must inventory sample containers upon receipt from the laboratory to ensure that adequate containers have been provided to meet analytical requirements for each monitoring event. After each event, any bottles used to collect water samples will be cleaned by the laboratory and either picked up by or shipped to the field crew.

2.1.2 Container Labeling and Sample Identification Scheme

All samples will be identified with a unique identification code to ensure that results are properly reported and interpreted. Samples will be identified such that the site, sampling location, matrix, sampling equipment and sample type (i.e., environmental sample or QC sample) can be distinguished by a data reviewer or user. Sample identification codes will consist of a site identification code, a matrix code, and a unique sample identification code. The format for sample identification codes is SM- ###.# - AAAA - XXX, where:

- SM indicates that the sample was collected as part of the SMB JG7 WMP Group CIMP.
- ###- identifies the sequentially numbered monitoring event, and the # is an optional indicator for re-samples collected for the same event. Sample events are numbered from 001 to 999 and will not be repeated.
- AAAA indicates the unique site ID for each site.
- XXX identifies the sample number unique to a sample bottle collected for a single event. Sample bottles are numbered sequentially from 001 to 999 and will not be repeated within a single event.

Alternatively, if the above naming convention is not employed, the selected alterative convention will be consistent between sampling events and sampling stations.

Custom bottle labels should be produced using blank waterproof labels and labeling software. This approach will allow the site and analytical constituent information to be entered in advance and printed as needed prior to each monitoring event. Labels will be placed on the appropriate bottles in a dry environment; applying labels to wet sample bottles should be avoided. Labels should be placed on sides of bottles rather than on bottle caps. All sample containers will be pre-labeled before each sampling event to the extent practicable. Pre-labeling sample containers simplifies field activities, leaving only sample collection time and date and field crew initials to be filled out in the field. Labels should include the following information:

Program Name	Date	Analytical Requirements
Station ID	Collection Time	Preservative Requirements
Sample ID	Sampling Personnel	Analytical Laboratory

2.1.3 Field Meter Calibration

Calibration of field measurement equipment is performed as described in the owner's manuals for each individual instrument. Each individual field crew will be responsible for calibrating their field measurement equipment. Field monitoring equipment must meet the requirements outlined in **Table B-1** and be calibrated before field events based on manufacturer guidance, but at a minimum prior to each event. **Table B-7** outlines the typical field instrument calibration procedures for each piece of equipment requiring calibration. Each calibration will be documented on each event's calibration log sheet (presented in **Appendix D**).

If calibration results do not meet manufacturer specifications, the field crew should first try to recalibrate using fresh aliquots of calibration solution. If recalibration is unsuccessful, new calibration solution should be used and/or maintenance should be performed. Each attempt should be recorded on the equipment calibration log. If the calibration results cannot meet manufacturer's specifications, the field crew should use a spare field measuring device that can be successfully calibrated. If a spare field measuring device that can be successfully calibrated is unavailable, field crews shall note the use of unsuccessfully calibrated equipment on each appropriate field log sheet. Additionally, the SMB JG7 WMP Group should be notified.

Calibration should be verified using at least one calibration fluid within the expected range of field measurements, both immediately following calibration and at the end of each monitoring day. Individual parameters should be recalibrated if the field meters do not measure a calibration fluid within the range of accuracy presented in **Table B-1**. Calibration verification documentation will be retained in the event's calibration verification log.

Table B-7
Calibration of Field Measurement Equipment

Equipment / Instrument	Calibration and Verification Description	Frequency of Calibration	Frequency of Calibration Verification	Responsible Party
pH Probe	Calibration using standard buffer solutions. Use of mid-range buffer to verify successful calibration.	Day prior to or 1st day of sampling event	After calibration and at the end of each sampling day	Individual Sampling Crews
Temperature	Is factory-set and requires no subsequent calibration.			
Dissolved Oxygen Probe	Calibrated using water saturated air environment. DO measurement of water-saturated air will be performed and compared to a standard table of DO concentrations in water as a function of temperature and barometric pressure to verify successful calibration.			
Conductivity	Follow manufacturer's specifications. Use of mid-range conductivity standard to verify successful calibration.			
Turbidity	Follow manufacturer's specifications. Use of mid-range turbidity standard to verify successful calibration.			

2.1.4 Weather Conditions

Monitoring will occur during dry and wet conditions. Dry weather will occur on days with less than 0.1 inch of rain and not within three days after a rain event of 0.1 inch or greater within the watershed, as measured from the closest Los Angeles County controlled rain gauge to the SMB JG7 WMP Group area. Wet weather will be defined as a storm event of greater than or equal to 0.1 inch of precipitation, as determined by the closest Los Angeles County controlled rain gauge to the SMB JG7 WMP Group area.

Note that if rainfall begins after dry weather monitoring has been initiated, then dry weather monitoring will be suspended and continued on a subsequent day when weather conditions meet the dry weather conditions.

The MRP includes specific criteria for the time of monitoring events. For dry weather toxicity monitoring, if triggered, sampling must take place during the historically driest month, which has been determined to be the month of August.

The first significant rain event of the storm year (first flush) will be monitored. The targeted storm events for wet weather sampling will be selected based on a reasonable probability that the events will result in substantially increased flows over at least 12 hours. Sufficient precipitation is needed to produce runoff and increase flow. The decision to sample a storm event will be made in consultation with weather forecasting information services after a quantitative precipitation forecast (QPF) has been determined. All efforts will be made to collect wet weather samples from all sites during a single targeted storm event. However, safety or other factors may make it infeasible to collect samples from a given storm event. For example, storm events that will require field crews to collect wet weather samples during holidays and/or weekends may not be sampled due to sample collection or laboratory staffing constraints.

For a storm to be tracked, the event will have a predicted rainfall of at least 0.25 inches with at least a 70 percent probability of rainfall 24 hours prior to the forecasted time of initial rainfall. Subsequent storm events must meet the tracking requirements, flow objectives, as well as be separated by a minimum of three days of dry weather. Antecedent conditions will be based on the LACDPW rain gage listed in **Table B-8.** Data can be obtained at http://dpw.lacounty.gov/wrd/Precip/index.cfm by clicking the 'See Data' link in the "Near Real-Time Precipitation Map" section. The web page displays a map showing real-time rainfall totals (in inches) for different rain gages. Although the default precipitation period is 24 hours, the user can view rainfall totals over different durations. Data from the rain gages is updated every 10 minutes. Because a significant storm event is based on predicted rainfall, it is recognized that this monitoring may be triggered without 0.25 inches of rainfall actually occurring. In this case, the monitoring event will still qualify as meeting this requirement provided that sufficient sample volume is collected to do all required laboratory analysis. Documentation will be provided showing the predicted rainfall amount.

Table B-8
Real-Time Rain Gage Used to Define Weather Conditions for CIMP Monitoring(1)

Rainfall Gage	Operator	Latitude	Longitude
Fire Station 56 Rolling Hills (376)	Los Angeles County Department of Public Works	33°45'35.25"N	118°21'16"W

[1]Information for the gage can be found at http://dpw.lacounty.gov/wrd/Precip/alertlist.cfm.

The National Weather Service's weather forecast for the SMB JG7 WMP Group area can be accessed on-line at http://www.wrh.noaa.gov/lox/ then click on the location of the SMB JG7 WMP Group area on the area map. From the forecast page, the link to "Quantitative Precipitation Forecast" provides forecasted precipitation in inches for the next 24 hours, in 3-hour increments for the first 12 hours and in 6-hour increments for the last 12 hours.

2.2 Sample Handling

Proper sample handling ensures the samples will comply with the monitoring methods and analytical hold time and provides traceable documentation throughout the history of the sample.

2.2.1 Documentation Procedures

The SMB JG7 WMP Group is responsible for ensuring that each field sampling team adheres to proper custody and documentation procedures. Field log sheets documenting sample collection and other monitoring activities for each site will be bound in a separate master logbook for each event. Alternatively, all measurements could be collected on an electronic device such as laptop or tablet computer. Field personnel have the following responsibilities:

1. Keep an accurate written record of sample collection activities on the field log sheets.
2. Ensure that all field log sheet entries are legible and contain accurate and inclusive documentation of all field activities.
3. Note errors or changes using a single line to cross out the entry and date and initial the change.
4. Ensure that a label is affixed to each sample collected and that the labels uniquely identify samples with a sample ID, site ID, date and time of sample collection and the sampling crew initials.
5. Complete the chain of custody forms accurately and legibly.

2.2.2 Field Documentation/Field Log

Field crews will keep a field log book for each sampling event that contains a calibration log sheet, a field log sheet for each site, and appropriate contact information. Alternatively, all measurements could be collected on an electronic device such as laptop or tablet computer. The following items should be recorded on the field log sheet for each sampling event:

- Monitoring station location (Station ID);
- Date and time(s) of sample collection;
- Name(s) of sampling personnel;
- Sample collection depth;
- Sample ID numbers and unique IDs for any replicate or blank samples;
- QC sample type (if appropriate);
- Requested analyses (specific parameters or method references);
- Sample type (e.g., grab or composite);
- The results of field measurements (e.g., flow, temperature, dissolved oxygen, pH, conductivity, turbidity) and the time that measurements were made;
- Qualitative descriptions of relevant water conditions (e.g., water color, flow level, clarity) or weather (e.g., wind, rain) at the time of sample collection;
- Trash observations (presence/absence);
- A description of any unusual occurrences associated with the sampling event, particularly those that may affect sample or data quality.

The field log will be scanned into a PDF within one week of the conclusion of each sampling event. Alternatively, all measurements could be collected on an electronic device such as laptop or tablet computer. **Appendix D** contains an example of the field log sheet.

2.2.3 Sample Handling and Shipment

The field crews will maintain custody of samples during each monitoring event. Chain-of-custody (COC) forms will accompany all samples during shipment to contract laboratories to identify the shipment contents. All water quality samples will be transported to the analytical laboratory by the field crew or by courier. The original COC form will accompany the shipment, and a signed copy of the COC form will be sent, typically via email or fax, by the laboratory to the field crew to be retained in the project file.

While in the field, samples will be stored on ice in an insulated container. Samples that must be shipped to the laboratory must be examined to ensure that container lids are tight and placed on ice to maintain the appropriate temperature. The ice packed with samples must be approximately 2 inches deep at the top and bottom of the cooler, and must contact each sample to maintain temperature. The original COC form(s) will be double-bagged in re-sealable plastic bags and either taped to the outside of the cooler or to the inside lid. Samples must be shipped to the contract laboratory according to transportation standards. The method(s) of shipment, courier name, and other pertinent information should be entered in the "Received By" or "Remarks" section of the COC form.

Coolers must be sealed with packing tape before shipping, unless transported by field or lab personnel, and must not leak. It is assumed that samples in tape-sealed ice chests are secure whether being transported by common carrier or by commercial package delivery. The laboratory's sample receiving department will examine the shipment of samples for correct documentation, proper preservation and compliance with holding times.

The following procedures are used to prevent bottle breakage and cross-contamination:

- Bubble wrap or foam pouches are used to keep glass bottles from contacting one another to prevent breakage, re-sealable bags will be used if available.
- All samples are transported inside hard plastic coolers or other contamination-free shipping containers.
- If arrangements are not made in advance, the laboratory's sample receiving personnel must be notified prior to sample shipment.

All samples remaining after successful completion of analyses will be disposed of properly. It is the responsibility of the personnel of each analytical laboratory to ensure that all applicable regulations are followed in the disposal of samples or related chemicals. Samples will be stored and transported as noted in **Table B-4**. Samples not analyzed locally will be sent on the same day that the sample collection process is completed, if possible. Samples will be delivered to the appropriate laboratory as will be indicated in **Table B-9**. Note that due to procurement procedures, the analytical laboratories have not been identified at this time. Information for all laboratories will be added to this table following their selection. All appropriate contacts will be listed along with lab certification information in **Table B-9**.

Table B-9
Information on Laboratories Conducting Analysis for the SMB JG7 WMP Group CIMP

Laboratory(1)	General Category of Analysis	Shipping Method	Contact	Phone	Address	Lab Certification No. & Expiration Date(2)
Information for all laboratories will be added to this table following their selection and upon CIMP update. Lab certifications are renewed on an annual basis.						

2.2.4 Chain-of Custody Forms

Sample custody procedures provide a mechanism for documenting information related to sample collection and handling. Sample custody must be traceable from the time of sample collection until results are reported. A sample is considered under custody if:

- It is in actual possession.
- It is in view after in physical possession.
- It is placed in a secure area (accessible by or under the scrutiny of authorized personnel only after in possession).

A COC form must be completed after sample collection and prior to sample shipment or release. The COC form, sample labels, and field documentation will be cross-checked to verify sample identification, type of analyses, number of containers, sample volume, preservatives, and type of containers. A complete COC form is to accompany the transfer of samples to the analyzing laboratory. A typical COC form is presented in **Appendix D**.

2.2.5 Laboratory Custody Procedures

Laboratories will follow sample custody procedures as outlined in the laboratory's Quality Assurance (QA) Manual. A copy of each contract laboratory's QA Manual should be available at the laboratory upon request. Laboratories shall maintain custody logs sufficient to track each sample submitted and to analyze or preserve each sample within specified holding times. The following sample control activities must be conducted at the laboratory:

- Initial sample login and verification of samples received with the COC form;
- Document any discrepancies noted during login on the COC;
- Initiate internal laboratory custody procedures;
- Verify sample preservation (e.g., temperature);
- Notify the SMB JG7 WMP Group if any problems or discrepancies are identified; and,
- Perform proper sample storage protocols, including daily refrigerator temperature monitoring and sample security.

Laboratories shall maintain records to document that the above procedures are followed. Once samples have been analyzed, samples will be stored at the laboratory for at least 60 days. After this period, samples may be disposed of properly.

2.3 Field Protocols

Briefly, the key aspects of quality control associated with field protocols for sample collection for eventual chemical and toxicological analyses are as follows:

1. Field personnel will be thoroughly trained in the proper use of sample collection gear and will be able to distinguish acceptable versus unacceptable water samples in accordance with pre-established criteria.
2. Field personnel will be thoroughly trained to recognize and avoid potential sources of sample contamination (e.g., engine exhaust, ice used for cooling).
3. Sampling gear and utensils which come in direct contact with the sample will be made of non-contaminating materials (e.g., borosilicate glass, high-quality stainless steel and/or Teflon™, according to protocol) and will be thoroughly cleaned between sampling stations according to appropriate cleaning protocol (rinsing thoroughly at minimum).
4. Sample containers will be of the recommended type and will be free of contaminants (i.e., pre-cleaned).
5. Conditions for sample collection, preservation, and holding times will be followed.

Field crews will be comprised of a minimum of two persons per crew.. To ensure safety, field crews will have the PPE. Other constraints on sampling events include, but are not limited to, lab closures and toxicity testing organism availability. Sampling events should proceed in the following manner:

1. Before leaving the sampling crew base of operations, confirm number and type of sample containers as well as the complete equipment list.
2. Proceed to the first sampling site.
3. Fill-out the general information on the field log sheet.
4. Collect the environmental and quality assurance/quality control (QA/QC) samples indicated on the event summary sheet and store samples appropriately. Using the field log sheet, confirm that all appropriate containers were filled.
5. Collect field measurements and observations, and record these on the field log sheet.
6. Repeat the procedures in steps 3, 4, and 5 for each of the remaining sampling sites.
7. Complete the COC forms using the information on the field log sheets.
8. After sample collection is completed, deliver and/or ship samples to appropriate laboratory.

2.4 Sample Collection

All samples will be collected in a manner appropriate for the specific analytical methods to be used. The proper sampling techniques, outlined in this section, will ensure that the collected samples are representative of the waterbodies sampled. Should field crews feel that it is unsafe to collect samples for any reason, the field crews **SHOULD NOT COLLECT** a sample and note on the field log that the sample was not collected, why the sample was not collected, and provide photo documentation, if feasible.

2.4.1 Overview of Sampling Techniques

As described below, the method used to collect water samples is dependent on the depth, flow, and sampling location (receiving water, outfall). Nonetheless, in all cases:

1. Throughout each sample collection event, the sampler should exercise aseptic techniques (i.e., do not touch the inner surfaces or lip edges of the sample bottle or cap).
2. The sampler should use clean, powder-free, nitrile gloves for each site to prevent contamination.
3. When collecting the sample, the sampler should not breathe, sneeze, or cough in the direction of the container.
4. Gloves should be changed if they are soiled, or if the potential for cross-contamination exists from handling sampling materials or samples.
5. While the sample is collected, the bottle lid shall not be placed on the ground.
6. The sampler should not eat or drink during sample collection.
7. The sampler should not smoke during sample collection.
8. Each person on the field crew should wear clean clothing that is free of dirt, grease, or other substances that could contaminate the sampling apparatus or sample bottles.
9. Sampling should not occur near a running vehicle. Vehicles should not be parked within the immediate sample collection area, when possible, even non-running vehicles.
10. When the sample is collected, ample air space should be left in the bottle to facilitate mixing by shaking for lab analysis, unless otherwise required by the method.
11. After the sample is collected and the cap is tightly screwed back on the bottle, the time of sampling should be recorded on the field log sheet.
12. Any QA/QC samples that are collected should be also be noted on the field log sheet and labeled according the convention described in **Section 2.1** of this Attachment.
13. Samples should be stored as previously described.
14. COC forms should be filled out as described in **Section 2.2** of this Attachment and delivered to the appropriate laboratory as soon as feasible to ensure hold times are met.

To prevent contamination of samples, clean metal sampling techniques using USEPA protocols outlined in USEPA Method 1669[7] will be used throughout all phases of the water sample collection. The protocol for clean metal sampling, based on USEPA Method 1669, is summarized below:

1. Samples are collected in rigorously pre-cleaned sample bottles with any tubing specially processed to clean sampling standards.
2. At least two persons, wearing clean, powder-free nitrile or latex gloves at all times, are required on a sampling crew.

7 USEPA. April 1995. *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels.* EPA 821-R-95-034.

3. One person, referred to as “dirty hands”, opens only the outer bag of all double-bagged sample bottles.
4. The other person, referred to as “clean hands”, reaches into the outer bag, opens the inner bag and removes the clean sample bottle.
5. Clean hands rinses the bottle at least two times by submerging the bottle, removing the bottle lid, filling the bottle approximately one-third full, replacing the bottle lid, gently shaking and then emptying the bottle. Clean hands then collects the sample by submerging the bottle, removing the lid, filling the bottle and replacing the bottle cap while the bottle is still submerged.
6. After the sample is collected, the sample bottle is double-bagged in the opposite order from which it was removed from the same double-bagging.
7. Clean, powder-free gloves are changed whenever something not known to be clean has been touched.

2.4.2 Field Measurements and Observations

Field measurements will be collected and observations made at each sampling site during sample collection. Field measurements will include the parameters identified in the CIMP for which a laboratory analysis is not being conducted. Field monitoring equipment must meet the requirements outlined in **Table B-3**. All field measurement results and field observations will be recorded on a field log sheet similar to the one presented in **Appendix D** and as described in **Section 2.2** of this Attachment.

Measurements (except for flow) will be collected at approximately mid-stream, mid-depth at the location of greatest flow (if feasible) with a Hydrolab DS4 multi-probe meter, or comparable instrument(s). If at any time the collection of field measurements by wading appears to be unsafe, field crews will not attempt to collect mid-stream, mid-depth measurements. Rather, field measurements will be made either directly from a stable, unobstructed area at the channel edge, or by using a telescoping pole and intermediate container to obtain a sample for field measurements and for filling sample containers. For situations where flows are not sufficiently deep to submerge the probes, an intermediate container will be utilized. The location of field measurements will be documented on the field log sheet.

Flow measurements will be collected as outlined in the following subsections at freshwater receiving water and non-stormwater outfall monitoring sites. Regardless of measurement technique used, if a staff gage is present the gage height will be noted. Field crews may not be able to measure flow at several sites during wet weather because of inaccessibility of the site. If this is the case, site inaccessibility will be documented on the field log sheet.

The field sampling crew has the primary responsibility for responding to failures in the sampling or measurement systems. Deviations from established monitoring protocols will be documented in the comment section of the field log sheet and noted in the post event summaries. If monitoring equipment fails, monitoring personnel will report the problem in the notes section of the field log sheet and will not record data values for the variables in question. Broken equipment will be replaced or repaired prior to the next field use. Data collected using faulty equipment will not be used.

2.4.2.1 *Velocity Meter Flow Measurements*

For sampling sites where water is deep enough (>0.1-foot) a velocity meter will be utilized. For these cases, velocity will be measured at approximately equal increments across the width of the flowing water using a Marsh-McBirney Flo-Mate® velocity meter[8] or equivalent, which uses an electromagnetic velocity sensor. A “flow pole” will be used to measure the water depth at each measurement point and to properly align the sensor so that the depth of each velocity measurement is approximately equal to 0.6 *

8 For more information, see http://marsh-mcbirney.com/Products/2000.htm

total depth, which is representative of the average velocity. The distance between velocity measurements taken across the stream is dependent on the total width. No more than 10% of the flow will pass through any one cross section.

2.4.2.2 *Shallow Sheet Flow Measurements*

If the depth of flow does not allow for the measurement of flow with a velocity meter (<0.1-foot) a "float" will be used to measure the velocity of the flowing water. The width, depth, velocity, cross section, and corresponding flow rate will be estimated as follows:

- **Sheet flow width:** The width (W) of the flowing water (not the entire part of the channel that is damp) is measured at the "top", "middle", and "bottom" of a marked-off distance – generally 10 feet (e.g., for a 10-foot marked-off section, W_{Top} W_{Top} is measured at 0-feet, W_{Mid} W_{Mid} is measured at 5 feet, and W_{Bottom} W_{Bottom} is measured at 10 feet).
- **Sheet flow depth:** The depth of the sheet flow is measured at the top, middle, and bottom of the marked-off distance. Specifically, the depth (D) of the sheet flow is measured at 25%, 50%, and 75% of the flowing width (e.g., $D_{50\%}^{Mid}$ $D_{50\%}^{Mid}$ is the depth of the water at middle of the section in the middle of the sheet flow) at each of the width measurement locations. It is assumed that the depth at the edge of the sheet flow (i.e., at 0% and 100% of the flowing width) is zero.
- **Representative cross-section:** Based on the collected depth and width measurements, the representative cross-sectional area across the marked-off sheet flow is approximated as follows:

$$\text{Re}\,presentative\;Cross\;Section\;=$$

$$Average\;\Big\{[\frac{W_{Top}}{4}\times(\frac{D_{25\%}^{Top}}{2}+\frac{\left(D_{50\%}^{Top}+D_{25\%}^{Top}\right)}{2}+\frac{\left(D_{75\%}^{Top}+D_{50\%}^{Top}\right)}{2}+\frac{D_{75\%}^{Top}}{2})],$$
$$[\frac{W_{Mid}}{4}\times(\frac{D_{25\%}^{Mid}}{2}+\frac{\left(D_{50\%}^{Mid}+D_{25\%}^{Mid}\right)}{2}+\frac{\left(D_{75\%}^{Mid}+D_{50\%}^{Mid}\right)}{2}+\frac{D_{75\%}^{Mid}}{2})],$$
$$[\frac{W_{Bottom}}{4}\times(\frac{D_{25\%}^{Bottom}}{2}+\frac{\left(D_{50\%}^{Bottom}+D_{25\%}^{Bottom}\right)}{2}+\frac{\left(D_{75\%}^{Bottom}+D_{50\%}^{Bottom}\right)}{2}+\frac{D_{75\%}^{Bottom}}{2})]\Big\}$$

$$\text{Re}\,presentative\;Cross\;Section\;=$$

$$Average\;\Big\{[\frac{W_{Top}}{4}\times(\frac{D_{25\%}^{Top}}{2}+\frac{\left(D_{50\%}^{Top}+D_{25\%}^{Top}\right)}{2}+\frac{\left(D_{75\%}^{Top}+D_{50\%}^{Top}\right)}{2}+\frac{D_{75\%}^{Top}}{2})],$$
$$[\frac{W_{Mid}}{4}\times(\frac{D_{25\%}^{Mid}}{2}+\frac{\left(D_{50\%}^{Mid}+D_{25\%}^{Mid}\right)}{2}+\frac{\left(D_{75\%}^{Mid}+D_{50\%}^{Mid}\right)}{2}+\frac{D_{75\%}^{Mid}}{2})],$$
$$[\frac{W_{Bottom}}{4}\times(\frac{D_{25\%}^{Bottom}}{2}+\frac{\left(D_{50\%}^{Bottom}+D_{25\%}^{Bottom}\right)}{2}+\frac{\left(D_{75\%}^{Bottom}+D_{50\%}^{Bottom}\right)}{2}+\frac{D_{75\%}^{Bottom}}{2})]\Big\}$$

- **Sheet flow velocity:** Velocity is calculated based on the amount of time it took a float to travel the marked-off distance (typically 10-feet or more). Floats are normally pieces of leaves, litter, or floatables (suds, etc.). The time it takes the float to travel the marked-off distance is measured at least three times. Then average velocity is calculated as follows:

$$Average\;Surface\;Velocity\;=\;\frac{Distance\;Marked\;off\;for\;Float\;Measurement}{Average\;Time\;for\;Float\;to\;Travel\;Marked\;off\;Distance}$$

- **Flow Rate calculation:** For sheet flows, based on the above measurements/estimates, the estimated flow rate, Q, is calculated by:

  Q = f x (Representative Cross Section) x (Average Surface Velocity)

The coefficient f is used to account for friction effects of the channel bottom. That is, the float travels on the water surface, which is the most rapidly-traveling portion of the water column. The average velocity, not the surface velocity, determines the flow rate, and thus f is used to “convert” surface velocity to average velocity. In general, the value of f typically ranges from 0.60 – 0.90 (USGS 1982). Based on flow rate measurements taken during the LA River Bacteria Source Identification Study (CREST 2008) a value of 0.75 will be used for f.

2.4.2.3 *Free-flowing outfalls*

Some storm drain outfalls are free-flowing, meaning the runoff falls from an elevated outfall into the channel, which allows for collection of the entire flowing stream of water into a container of known volume (e.g., graduated bucket or graduated Ziploc bag). The time it takes to fill the known volume is measured using a stopwatch, and recorded on the field log. The time it takes to fill the container will be measured three times and averaged to ensure that the calculated discharge is representative. In some cases, a small portion of the runoff may flow around or under the container. For each measurement, “percent capture”, or the proportion of flow estimated to enter the bucket, will be recorded. For free-flowing outfalls, the estimated flow rate, Q, is calculated by:

$$Q = Average\left[\frac{Filled\ \ container\ Volume}{(Time\ to\ Fill\ \ Container)\times(Estimated\ \ Capture)}\right]$$

$$Q = Average\left[\frac{Filled\ \ container\ Volume}{(Time\ to\ Fill\ \ Container)\times(Estimated\ \ Capture)}\right]$$

Based on measurements of free-flowing outfalls during the LA River Bacteria Source Identification Study (CREST, 2008), estimated capture typically ranges from 0.75 – 1.0.

2.4.3 Sampling Techniques for the Collection of Water

The following subsections provide details on the various techniques that can be utilized to collect water quality samples. Should field crews feel that it is unsafe to collect samples for any reason, the field crews **SHOULD NOT COLLECT** a sample and note on the field log that the sample was not collected, why the sample was not collected, and provide photo documentation, if feasible.

2.4.3.1 *Direct Submersion: Hand Technique*

Where practical, all grab samples will be collected by direct submersion at mid-stream, mid-depth using the following procedures:

1. Follow the standard sampling procedures described in **Section 2.4.1** of this Attachment.
2. Remove the lid, submerge the container to mid-stream/mid-depth, let the container fill and secure the lid. In the case of mercury samples, remove the lid underwater to reduce the potential for contamination from the air.
3. Place the sample on ice.

4. Collect the remaining samples including quality control samples, if required, using the same protocols described above.
5. Follow the sample handling procedures described in **Section 2.2** of this Attachment.

2.4.3.2 *Intermediate Container Technique*

Samples may be collected with the use of a clean intermediate container, if necessary, following the steps listed below. An intermediate container may include a container that is similar in composition to the sample container, a pre-cleaned pitcher made of the same material as the sample container, or a Ziploc bag. An intermediate container should not be reused at a different site without appropriate cleaning.

1. Follow the standard sampling procedures described in **Section 2.4.1** of this Attachment.
2. Submerge the intermediate container to mid-stream/mid-depth (if possible), let the container fill, and quickly transfer the sample into the individual sample container(s) and secure the lid(s).
3. Place the sample(s) on ice.
4. Collect remaining samples including quality control samples, if required, using the same protocols described above.
5. Follow the sample handling procedures described in **Section 2.2** of this Attachment.

Some flows may be too shallow to fill a container without using an intermediate container. When collecting samples from shallow sheet flows it is very important to not scoop up algae, sediment, or other particulate matter on the bottom because such debris is not representative of flowing water. To prevent scooping up such debris either: (1) find a spot where the bottom is relatively clean and allow the sterile intermediate container to fill without scooping; or (2) lay a clean sterile Ziploc® bag on the bottom and collect the water sample from on top of the bag. A fresh Ziploc® bag must be used at each site.

2.4.3.3 *Pumping*

Samples may be collected with the use of a peristaltic pump and specially cleaned tubing following the steps listed below. Sample tubing should not be reused at a different site without appropriate cleaning.

1. Follow the standard sampling procedures described in **Section 2.4.1** of this Attachment.
2. Attach pre-cleaned tubing into the pump, exercising caution to avoid allowing tubing ends to touch any surface known not to be clean. A separate length of clean tubing must be used at each sample location for which the pump is used.
3. Place one end of the tubing below the surface of the water. To the extent possible, avoid placing the tubing near the bottom so that settled solids are not pumped into the sample container.
4. Hold the other end of the tubing over the opening of the sample container, exercising care not to touch the tubing to the sample container.
5. Pump the necessary sample volume into the sample container and secure the lid.
6. Place the sample on ice.
7. Collect remaining samples including quality control samples, if required, using the same protocols described above.
8. Follow the sample handling procedures described in **Section 2.2** of this Attachment.

2.4.3.4 *Autosamplers*

Automatic sample compositors (autosamplers) are used to characterize the entire flow of a storm in one analysis. They can be programmed to take aliquots at either time- or flow-based specified intervals. Before beginning setup in the field, it is recommended to read the manufacturer's instructions. The general steps to set up the autosampler are described below:

1. Connect power source to autosampler computer. This can be in the form of a battery or a power cable.
2. Install pre-cleaned tubing into the pump. Clean tubing will be used at each site and for each event, in order to minimize contamination.
3. Attach strainer to intake end of the tubing and install in sampling channel.
4. If running flow based composite samples; install flow sensor in sampling channel and connect it to the automatic compositor.
5. Label and install composite bottle(s). If sampler is not refrigerated, then add enough ice to the composite bottle chamber to keep sample cold for the duration of sampling or until such time as ice can be refreshed. Make sure not to contaminate the inside of the composite bottle with any of the ice.
6. Program the autosampler as per the manufacturer's instructions and make sure the autosampler is powered and running before leaving the site.

After the sample collection is completed the following steps must be taken to ensure proper sample handling:

1. Upon returning to the site, check the status of the autosampler and record any errors or missed samples. Note on the field log the time of the last sample, as this will be used for filling out the COCs.
2. Remove the composite bottle and store on ice. If dissolved metals are required, then begin the sample filtration process outlined in the following subsection, within 15 minutes of the last composite sample, unless compositing must occur at another location, in which case the filtration process should occur as soon as possible upon sample compositing.
3. Power down autosampler and leave sampling site.
4. The composite sample will need to be split into the separate analysis bottles either before being shipped to the laboratory or at the laboratory. This is best done in a clean and weatherproof environment, using clean sampling technique.

2.4.3.5 *Dissolved Metals Field Filtration*

Samples for dissolved metals will be filtered by the laboratory, or in the event samples for dissolved metals are required to be filtered in the field, the following method for dissolved field filtration will be conducted. A peristaltic pump or 50mL plastic syringe with a 0.45µm filter attached will be used to collect and filter the dissolved metals sample in the field. The apparatus will either come certified pre-cleaned from the manufacturer and confirmed by the analytical laboratory or be pre-cleaned by and confirmed by the analytical laboratory at least once per year. The apparatus will be double bagged in Ziploc plastic bags. Alternative an equivalent method may be utilized, if necessary.

To collect the sample for dissolved metals, first collect the total metals sample using clean sampling techniques. The dissolved sample will be taken from this container. Immediately prior to collecting the dissolved sample, shake the total metals sample. To collect the dissolved metals sample using clean sampling techniques, remove the syringe from the bag and place the tip of the syringe into the bottle containing the total metals sample and draw up 50 mL of sample into the syringe. Next, remove the filter from the zip-lock bag and screw it tightly into the tip of the syringe. Then put the tip of the syringe with the filter into the clean dissolved metals container and push the sample through the filter taking care not to touch the inside surface of the sample container with the apparatus. The sample volume needs to be a minimum of 20 mL. If the filter becomes clogged prior to generating 20 mL of sample, remove and dispose of the used filter and replace it with a new clean filter (using the clean sampling techniques).

Continue to filter the sample. When 20 mL has been collected, cap the sample bottle tightly and store on ice for delivery to the laboratory.

2.4.4 Receiving Water Sample Collection

A grab sample is a discrete individual sample. A composite sample is a mixture of samples collected over a period of time either as time or flow weighted. A time-weighted composite is created by mixing multiple aliquots collected at specified time intervals. A flow-weighted composite is created by mixing multiple aliquots collected at equal time intervals but where the volume of the aliquot is based on flow rate. Generally, grab samples will be collected during dry weather and composite samples will be collected during wet weather. Should field crews feel that it is unsafe to collect samples for any reason, the field crews **SHOULD NOT COLLECT** a sample and note on the field log that the sample was not collected, why the sample was not collected, and provide photo documentation, if feasible.

Grab samples will be used for dry weather sampling events, if triggered, because the composition of the receiving water will change less over time; and thus, the grab sample can sufficiently characterize the receiving water. Grab samples will be collected as described in **Section 2.4.3** of this Attachment. Monitoring site configuration and consideration of safety will dictate grab sample collection technique. The potential exists for monitoring sites to lack discernable flow. The lack of discernable flow may generate unrepresentative data. To address the potential confounding interference that can occur under such conditions, sites sampled should be assessed for the following conditions and sampled or not sampled accordingly:

- Pools of water with no flow or no visible connection to another surface water body should not be sampled. The field log should be completed for non-water quality data (including date and time of visit) and the site condition should be photo-documented.
- Flowing water (i.e., based on visual observations, flow measurements, and a photo-documented assessment of conditions immediately upstream and downstream of the sampling site) site should be sampled.

Wet weather receiving water samples collected from the Santa Monica Bay by boat will be single grab sample.

It is the combined responsibility of all members of the sampling crew to determine if the performance requirements of the specific sampling method have been met, and to collect additional samples if required. If the performance requirements outlined above or documented in sampling protocols are not met, the sample will be re-collected. If contamination of the sample container is suspected, a fresh sample container will be used. The SMB JG7 WMP Group will be contacted if at any time the sampling crew has questions about procedures or issues based on site-specific conditions.

2.4.5 Stormwater Outfall Sample Collection

Wet weather samples will generally be collected by a continuous sampler as either time- or flow-weighted composites at outfalls. Grab samples may be utilized to collect wet weather samples in certain situations, which may include, but are not limited to, situations where it is unsafe to collect composite samples or to perform investigative monitoring where composite sampling or installation of an auto-sampler may not be warranted. Sampling will not be undertaken if the outfalls are not flowing or if conditions exist where the receiving water is back-flowing into the outfall. It is the combined responsibility of all members of the sampling crew to determine if the performance requirements of the specific sampling method have been met, and to collect additional samples if required. If the performance requirements outlined above or documented in sampling protocols are not met, the sample will be re-collected. If contamination of the sample container is suspected, a fresh sample container will be used. The SMB JG7 WMP Group will be contacted if at any time the sampling crew has questions about procedures or issues based on site-specific conditions.

2.4.6 Non-Stormwater Outfall Screening Surveys and Sample Collection

The outfall screening process is designed to identify outfalls that have significant non-stormwater (NSW) discharges. The collection of water quality data will support the determination of significant NSW discharges as well as to characterize dry weather loading.

Preparation for Outfall Surveys

Preparation for outfall surveys includes preparation of field equipment, placing bottle orders, and contacting the necessary personnel regarding site access and schedule. The following steps should be completed two weeks prior to each outfall survey:

1. Check weather reports and LACDPW rain gage to ensure that antecedent dry weather conditions are suitable.
2. Contact appropriate Flood Maintenance Division personnel from LACDPW to notify them of dates and times of any activities in flood control channels.
3. Contact laboratories to order bottles and to coordinate sample pick-ups.
4. Confirm scheduled sampling date with field crews.
5. Set-up sampling day itinerary including sample drop-offs and pick-ups.
6. Compile field equipment.
7. Prepare sample labels.
8. Prepare event summaries to indicate the type of field measurements, field observations, and samples to be taken at each of the outfalls.
9. Prepare COCs.
10. Charge the batteries of field tablets (if used).

2.4.6.1 *Non-Stormwater Sample Collection*

Water quality samples will be collected consistent with the dry weather requirements outlined in the receiving water monitoring section using the direct submersion, intermediate container, shallow sheet flow, or pumping methods described in **Section 2.4.3** of this Attachment.

2.4.7 Stormborne Sediment Collection

No sediment collection sampling would be conducted under this program in the receiving waters as data from Santa Monica Canyon, as part of the JG2JG3 CIMP, will be evaluated for TMDL compliance.

2.4.8 Bioaccumulation Sample Collection

No bioaccumulation sampling will be conducted under this program.

2.4.9 Trash Monitoring

The SMB JG7 WMP Group members are implementing the Santa Monica Marine Debris TMDLs through the installation of full capture devices. As such, no specific monitoring is required or will be conducted for the Marine Debris TMDLs for these jurisdictions.

2.4.10 Plastic Pellet Monitoring

Manufacturers of plastic pellets were not identified within any of the SMB JG7 WMP Group's jurisdictional area, and monitoring for plastic pellets at the MS4 is not required. Appropriate actions for emergency spills and special circumstances for safety considerations are addressed for each jurisdiction.

2.4.11 Quality Control Sample Collection

Quality control samples will be collected in conjunction with representative samples to verify data quality. Quality control samples collected in the field will generally be collected in the same manner as environmental samples. Detailed descriptions of quality control samples are presented in **Section 3** of this Attachment.

Section 3
Quality Assurance/Quality Control

This section describes the quality assurance and quality control requirements and processes. Quality control samples will be collected in conjunction with environmental samples to verify data quality. Additional detail on data quality is provided in Section 13 (QA/QC Data Evaluation) of the *Caltrans Comprehensive Protocols Guidance Manual* (2000)[9]. Quality control samples collected in the field will generally be collected in the same manner as environmental samples. There are no requirements for quality control for field analysis of general parameters (e.g., temperature, pH, conductivity, dissolved oxygen, and pH) outlined in the SWAMP. However, field crews will be required to calibrate equipment as outlined previously. **Table B-10** presents the quality assurance parameter addressed by each quality assurance requirement as well as the appropriate corrective action if the acceptance limit is exceeded.

Table B-10
Quality Control Requirements

Quality Control Sample Type	QA Parameter	Frequency(1)	Acceptance Limits	Corrective Action
Quality Control Requirements – Field				
Equipment Blanks	Contamination	5% of all samples(2)	< MDL	Identify equipment contamination source. Qualify data as needed.
Field Blank	Contamination	5% of all samples	< MDL	Examine field log. Identify contamination source. Qualify data as needed.
Field Duplicate	Precision	5% of all samples	RPD < 25% if |Difference| > RL	Reanalyze both samples if possible. Identify variability source. Qualify data as needed.
Quality Control Requirements – Laboratory				
Method Blank	Contamination	1 per analytical batch	< MDL	Identify contamination source. Reanalyze method blank and all samples in batch. Qualify data as needed.
Lab Duplicate	Precision	1 per analytical batch	RPD < 25% if |Difference| > RL	Recalibrate and reanalyze.
Matrix Spike	Accuracy	1 per analytical batch	80-120% Recovery for GWQC 75-125% for Metals 50-150% Recovery for Pesticides (3)	Check LCS/CRM recovery. Attempt to correct matrix problem and reanalyze samples. Qualify data as needed.
Matrix Spike	Precision	1 per analytical	RPD < 30% if	Check lab duplicate RPD. Attempt

9 http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-03-105.pdf

Quality Control Sample Type	QA Parameter	Frequency(1)	Acceptance Limits	Corrective Action
Duplicate		batch	|Difference| > RL	to correct matrix problem and reanalyze samples. Qualify data as needed.
Laboratory Control Sample (or CRM or Blank Spike)	Accuracy	1 per analytical batch	80-120% Recovery for GWQC	Recalibrate and reanalyze LCS/ CRM and samples.
			75-125% for Metals	
			50-150% Recovery for Pesticides (3)	
Blank Spike Duplicate	Precision	1 per analytical batch	RPD < 25% if |Difference| > RL	Check lab duplicate RPD. Attempt to correct matrix problem and reanalyze samples. Qualify data as needed.
Surrogate Spike (Organics Only)	Accuracy	Each environmental and lab QC sample	30-150% Recovery3	Check surrogate recovery in LCS. Attempt to correct matrix problem and reanalyze sample. Qualify data as needed.

MDL = Method Detection Limit RL = Reporting Limit RPD = Relative Percent Difference
LCS = Laboratory Control Sample/Standard CRM = Certified/ Standard Reference Material
GWQC = General Water Quality Constituents

1. “Analytical batch” refers to a number of samples (not to exceed 20 environmental samples plus the associated quality control samples) that are similar in matrix type and processed/prepared together under the same conditions and same reagents (equivalent to preparation batch).
2. Equipment blanks will be collected by the field crew before using the equipment to collect sample.
3. Or control limits set at + 3 standard deviations based on actual laboratory data.

3.1 QA/QC Requirements and Objectives

3.1.1 Comparability

Comparability of the data can be defined as the similarity of data generated by different monitoring programs. For this monitoring program, this objective will be ensured mainly through use of standardized procedures for field measurements, sample collection, sample preparation, laboratory analysis, and site selection; adherence to quality assurance protocols and holding times; and reporting in standard units. Additionally, comparability of analytical data will be addressed through the use of standard operating procedures and extensive analyst training at the analyzing laboratory.

3.1.2 Representativeness

Representativeness can be defined as the degree to which the environmental data generated by the monitoring program accurately and precisely represent actual environmental conditions. For the CIMP, this objective will be addressed by the overall design of the program. Representativeness is attained through the selection of sampling locations, methods, and frequencies for each parameter of interest, and by maintaining the integrity of each sample after collection. Sampling locations were chosen that are representative of various areas within the watershed and discharges from the MS4, which will allow for the characterization of the watershed and impacts MS4 discharges may have on water quality.

3.1.3 Completeness

Data completeness is a measure of the amount of successfully collected and validated data relative to the amount of data planned to be collected for the project. It is usually expressed as a percentage value. A project objective for percent completeness is typically based on the percentage of the data needed for the program or study to reach valid conclusions.

Because the CIMP is intended to be a long term monitoring program, data that are not successfully collected during a specific sample event will not be recollected at a later date. Rather subsequent events conducted over the course of the monitoring will provide robust data sets to appropriately characterize conditions at individual sampling sites and the watershed in general. For this reason, most of the data planned for collection cannot be considered absolutely critical, and it is difficult to set a meaningful objective for data completeness.

However, some reasonable objectives for data are desirable, if only to measure the effectiveness of the program when conditions allow for the collection of samples (i.e., flow is present). The program goals for data completeness, shown in **Table B-3**, are based on the planned sampling frequency, SWAMP recommendations, and a subjective determination of the relative importance of the monitoring element within the CIMP. If, however, sampling sites do not allow for the collection of enough samples to provide representative data due to conditions (i.e., no flow) alternate sites will be considered. Data completeness will be evaluated on a yearly basis.

3.2 QA/QC Field Procedures

Quality control samples to be prepared in the field will consist of equipment blanks, field blanks, and field duplicates as described below.

3.2.1 Equipment Blanks

The purpose of analyzing equipment blanks is to demonstrate that sampling equipment is free from contamination. Equipment blanks will be collected by the analytical laboratory responsible for cleaning equipment and analyzed for relevant pollutants before sending the equipment to the field crew. Equipment blanks will consist of laboratory-prepared blank water (certified to be contaminant-free by the laboratory) processed through the sampling equipment that will be used to collect environmental samples.

The equipment blanks will be analyzed using the same analytical methods specified for environmental samples. If any analytes of interest are detected at levels greater than the MDL, the source(s) of contamination will be identified and eliminated (if possible), the affected batch of equipment will be re-cleaned, and new equipment blanks will be prepared and analyzed before the equipment is returned to the field crew for use.

3.2.2 Field Blanks

The purpose of analyzing field blanks is to demonstrate that sampling procedures do not result in contamination of the environmental samples. Per the Quality Assurance Management Plan for SWAMP (SWRCB, 2008) field blanks are to be collected as follows:

- At a frequency of 5% of samples collected for the following constituents: trace metals in water (including mercury), VOC samples in water and sediment, DOC samples in water, and bacteria samples.
- Field blanks for other media and analytes should be conducted upon initiation of sampling, and if field blank performance is acceptable (as described in **Table B-10**), further collection and analysis of field blanks for these other media and analytes need only be performed on an as-needed basis, or during field performance audits. An as-needed basis for the SMB JG7 WMP

Group CIMP will be annually.

Field blanks will consist of laboratory-prepared blank water (certified to be contaminant-free by the laboratory) processed through the sampling equipment using the same procedures used for environmental samples.

If any analytes of interest are detected at levels greater than the MDL, the source(s) of contamination should be identified and eliminated, if possible. The sampling crew should be notified so that the source of contamination can be identified (if possible) and corrective measures taken prior to the next sampling event.

3.2.3 Field Duplicates

The purpose of analyzing field duplicates is to demonstrate the precision of sampling and analytical processes. Field duplicates will be prepared at the rate of 5% of all samples, and analyzed along with the associated environmental samples. Field duplicates will consist of two samples collected simultaneously, to the extent practicable. If the Relative Percent Difference (RPD) of field duplicate results is greater than the percentage stated in **Table B-10** and the absolute difference is greater than the RL, both samples should be reanalyzed, if possible. The sampling crew should be notified so that the source of sampling variability can be identified (if possible) and corrective measures taken prior to the next sampling event.

3.3 QA/QC Laboratory Analyses

Quality control samples prepared in the laboratory will consist of method blanks, laboratory duplicates, matrix spikes/duplicates, laboratory control samples (standard reference materials), and toxicity quality controls.

3.3.1 Method Blanks

The purpose of analyzing method blanks is to demonstrate that sample preparation and analytical procedures do not result in sample contamination. Method blanks will be prepared and analyzed by the contract laboratory at a rate of at least one for each analytical batch. Method blanks will consist of laboratory-prepared blank water processed along with the batch of environmental samples. If the result for a single method blank is greater than the MDL, or if the average blank concentration plus two standard deviations of three or more blanks is greater than the RL, the source(s) of contamination should be corrected, and the associated samples should be reanalyzed.

3.3.2 Laboratory Duplicates

The purpose of analyzing laboratory duplicates is to demonstrate the precision of the sample preparation and analytical methods. Laboratory duplicates will be analyzed at the rate of one pair per sample batch. Laboratory duplicates will consist of duplicate laboratory fortified method blanks. If the RPD for any analyte is greater than the percentage stated in **Table B-10** and the absolute difference between duplicates is greater than the RL, the analytical process is not being performed adequately for that analyte. In this case, the sample batch should be prepared again, and laboratory duplicates should be reanalyzed.

3.3.3 Matrix Spikes and Matrix Spike Duplicates

The purpose of analyzing matrix spikes and matrix spike duplicates is to demonstrate the performance of the sample preparation and analytical methods in a particular sample matrix. Matrix spikes and matrix spike duplicates will be analyzed at the rate of one pair per sample batch. Each matrix spike and matrix spike duplicate will consist of an aliquot of laboratory-fortified environmental sample. Spike concentrations should be added at five to ten times the reporting limit for the analyte of interest.

If the matrix spike recovery of any analyte is outside the acceptable range, the results for that analyte have failed to meet acceptance criteria. If recovery of laboratory control samples is acceptable, the analytical process is being performed adequately for that analyte, and the problem is attributable to the sample matrix. An attempt will be made to correct the problem (e.g., by mixing, concentration, etc.), and the samples and matrix spikes will be re-analyzed.

If the matrix spike duplicate RPD for any analyte is outside the acceptable range, the results for that analyte have failed to meet acceptance criteria. If the RPD for laboratory duplicates is acceptable, the analytical process is being performed adequately for that analyte, and the problem is attributable to the sample matrix. An attempt will be made to correct the problem (e.g., by mixing, concentration, etc.), and the samples and matrix spikes will be re-analyzed.

3.3.4 Laboratory Control Samples

The purpose of analyzing laboratory control samples (or a standard reference material) is to demonstrate the accuracy of the sample preparation and analytical methods. Laboratory control samples will be analyzed at the rate of one per sample batch. Laboratory control samples will consist of laboratory fortified method blanks or a standard reference material. If recovery of any analyte is outside the acceptable range, the analytical process is not being performed adequately for that analyte. In this case, the sample batch should be prepared again, and the laboratory control sample should be reanalyzed.

3.3.5 Surrogate Spikes

Surrogate recovery results are used to evaluate the accuracy of analytical measurements for organics analyses on a sample-specific basis. A surrogate is a compound (or compounds) added by the laboratory to method blanks, samples, matrix spikes, and matrix spike duplicates prior to sample preparation, as specified in the analytical methodology. Surrogates are generally brominated, fluorinated or isotopically labeled compounds that are not usually present in environmental media. Results are expressed as percent recovery of the surrogate spike. Surrogate spikes are applicable for analysis of PCBs and pesticides.

3.3.6 Toxicity Quality Control

For aquatic toxicity tests, the acceptability of test results is determined primarily by performance-based criteria for test organisms, culture and test conditions, and the results of control bioassays. Control bioassays include monthly reference toxicant testing. Test acceptability requirements are documented in the method documents for each bioassay method.

Section 4
Instrument/Equipment Calibration and Frequency

Frequencies and procedures for calibration of analytical equipment used by each contract laboratory are documented in the QA Manual for each laboratory. Any deficiencies in analytical equipment calibration should be managed in accordance with the QA Manual for each contract laboratory. Any deficiencies that affect analysis of samples submitted through this program must be reported to the SMB JG7 WMP Group. Laboratory QA Manuals are available for review at the analyzing laboratory.

Attachment C

Outfall Investigation Photographic Log

Site ID: SMBJ7-O-1 **GPS Coordinates:** 33.720405, -118.328695 **Description:** - Outfall diameter approximately 5 feet - Outfall appears to be corrugated metal pipe - Outfall not discharging at time of inspection - Cliff is moist, suggesting minor discharge - Relatively large area to allow for ponding in event of outfall discharge - Outfall not accessible – protruding from cliff - Approximately ¼ mile west of paved ground at White Point /Royal Palms County Beach parking lot (walked on rocks to access and take photos) - No safe access to associated with this outfall	  

RB-AR17017

Land Use	HUC12		JG7 WMP Area		SMBJ7-O-1	
	Acres	% of Total	Acres	% of Total	Acres	% of Total
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	1.4	0.4
Education	806.2	3.3	32.2	3.1	2.6	0.7
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	60.0	15.8
SF Residential	11265.0	46.7	561.5	53.2	134.2	35.5
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	180.3	47.6
Total	24115.1	100	1056	100	378.4	100

Site ID:

SMBJ7-O-2

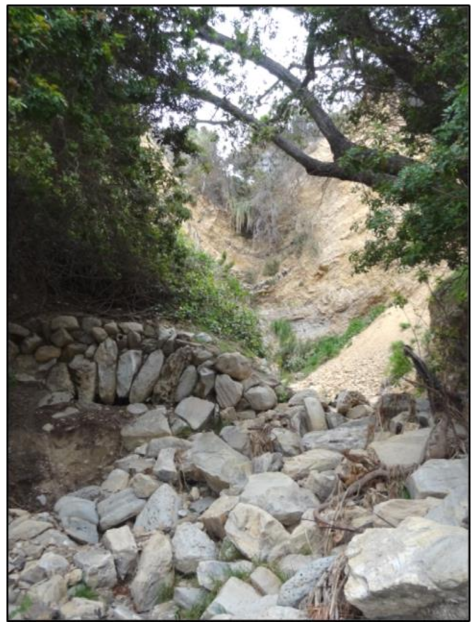
GPS Coordinates:

33.718976, -118.323855

Coordinates of bridge

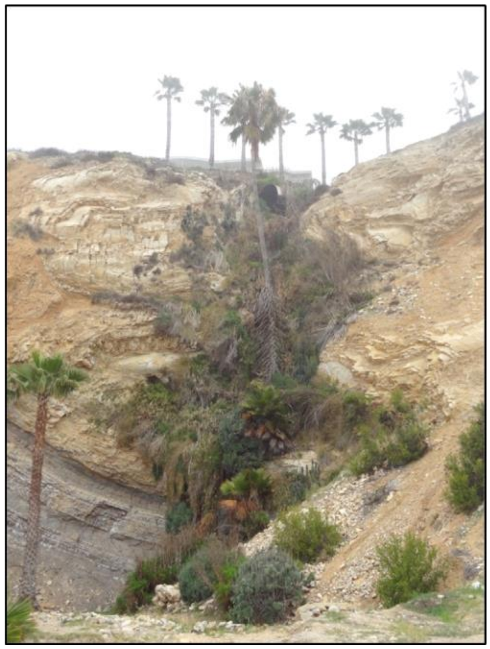
Description:

- Could not observe the outfall from either below or above (private property above)
- Photos are of rock-lined spillway that appears to be downstream of outfall
- No discharge observed at time of investigation (dry)
- Located just west of White Point/Royal Palms County Beach parking lot
- This is adjacent to Station SMB 7-06 which is currently one of the active bacteria TMDL monitoring stations



RB-AR17019

	HUC12		JG7 WMP Area		SMBJ7-O-2	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	0.0	0.0
Education	806.2	3.3	32.2	3.1	8.0	5.7
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	6.8	4.8
SF Residential	11265.0	46.7	561.5	53.2	99.6	70.7
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	26.5	18.8
Total	24115.1	100	1056	100	140.8	100

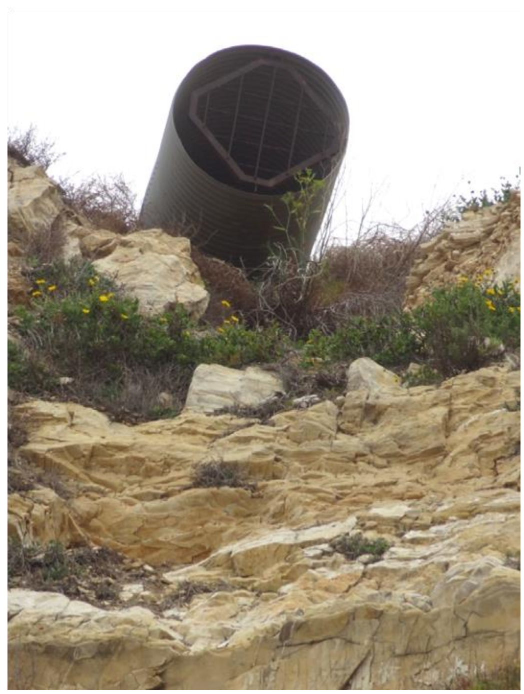
Site ID: SMBJ7-O-3 **GPS Coordinates:** 33.718484, -118.321043 **Description:** - Outfall diameter approximately 3-4 feet - Outfall appears to be corrugated metal pipe - Outfall was discharging at time of investigation (approximately 5^+ gpm) - Ponding was observed at the time of investigation – flow did not reach downstream culvert that brings flow to the beach - Mouth of pond/earth channel is connected to a 2 foot diameter culvert that appears to be the designated location of SMB 7-06 (see photos on next page) - Ponding location and downstream channel located on west site of White Point/Royal Palms County Beach parking lot	  

RB-AR17021

Site ID: SMBJ7-O-3 (continued)	 

	HUC12		JG7 WMP Area		SMBJ7-O-3	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	13.9	7.9
Education	806.2	3.3	32.2	3.1	0.0	0.0
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	7.3	4.2
SF Residential	11265.0	46.7	561.5	53.2	131.3	74.5
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	23.8	13.5
Total	24115.1	100	1056	100	176.4	100

Site ID: SMBJ7-O-3 (Downstream segment) **GPS Coordinates:** 33.7177861, -118.3211305 **Description:** - Outfall diameter approximately 2 feet - Outfall not discharging at time of investigation (dry) - Outfall is downstream of SMBJ7-O-3, carries water from SMBJ7-O-3 pond/earth channel to the beach front - Accessible with parking located nearby in White Point/Royal Palms County Beach parking lot	

Site ID: SMBJ7-O-4 **GPS Coordinates:** 33.715769, -118.317973 **Description:** - Outfall diameter approximately 3-4 feet - Outfall not discharging at time of investigation (dry) - Outfall is hanging from cliff – no safe access - Located approximately 500 feet east of White Point/Royal Palms County Beach parking lot and adjacent to SMB 7-06 which is already one of the bacteria TMDL monitoring stations.	 

Site ID:

SMBJ7-O-5

GPS Coordinates:

33.714331, -118.316115

Description:

- Outfall Diameter approximately 3 feet
- Two pipes (one plastic, one concrete channel) on top of each other
- Outfall(s) not discharging during the time of inspection
- To access site, had to pass a gate that said “Danger” located approximately ¼ mile east of White Point/Royal Palms County Beach parking lot
- The shoreline at the zero point of this outfall is SMB 7-07 which has not been monitored since 2009 due to a landslide which resulted in an unsafe access road. Prior to 2009, SMB 7-07 was monitored for bacteria weekly.

RB-AR17026

	HUC12		JG7 WMP Area		SMBJ7-O-4/5	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	0.0	0.0
Education	806.2	3.3	32.2	3.1	5.9	2.6
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	22.1	9.8
SF Residential	11265.0	46.7	561.5	53.2	96.7	43.0
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	100.1	44.5
Total	24115.1	100	1056	100	224.8	100

Site ID:

SMBJ7-O-6

GPS Coordinates:

33.711563, -118.303522

Description:

- Width of Outfall approximately 25’
- Height of Outfall approximately 18’
- Outfall discharge was a slow trickle during time of observation
- Water ponded at mouth of the outfall
- Trash and excessive vegetation at mouth of outfall
- Accessible from path that begins on Paseo Del Mar and Barbara Street
- Path was initially determined to be safe if a handrail was installed. However, further assessment by the County Sanitation District, the monitoring agency, found the path to be unsafe to access especially during wet weather events

	HUC12		JG7 WMP Area		SMBJ7-O-6	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	0.0	0.0
Education	806.2	3.3	32.2	3.1	2.8	1.7
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	21.9	13.6
SF Residential	11265.0	46.7	561.5	53.2	125.7	77.9
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	11.0	6.8
Total	24115.1	100	1056	100	161.4	100

Site ID: SMBJ7-O-7 **GPS Coordinates:** 33.709988, -118.298985 **Description:** - Outfall diameter approximately 1.5 feet - Outfall material corroded corrugated metal pipe (broken in multiple areas) - Outfall was not discharging at time of inspection - Pipe was filled with sediment – suggests minimal flow if any - Located in identified vicinity of SMB-7-08 - Accessible from a path that begins on Paseo Del Mar and Meyler Street. The shoreline across from this location is designated as SMB 7-08 and is already being monitored for bacteria weekly.	  

Site ID:

SMBJ7-O-8

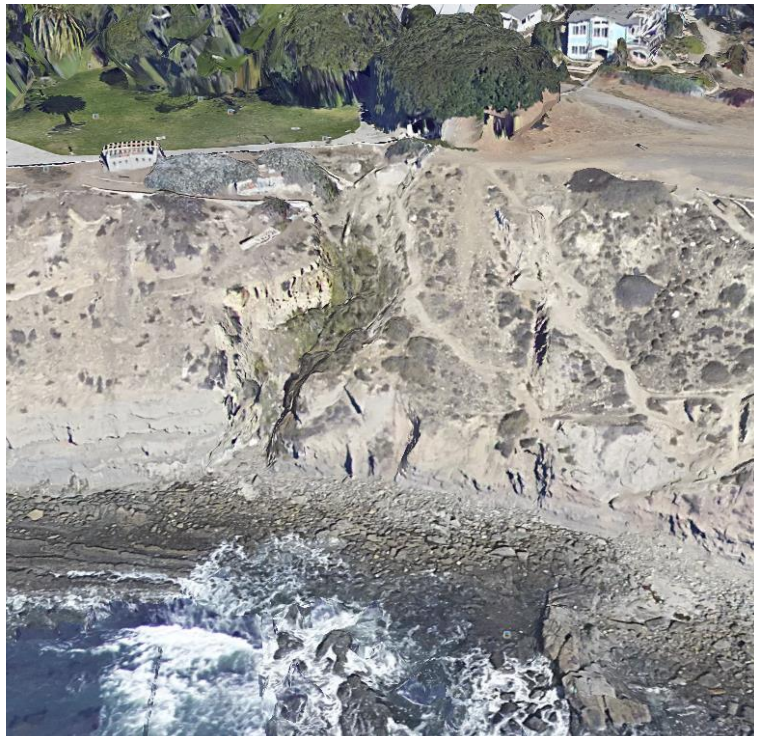
GPS Coordinates:

33.709331, -118.296322

Description:

- Outfall diameter approximately 1.5 feet
- Outfall material is corrugated metal pipe
- Outfall not discharging at time of inspection
- Outfall represents only road runoff
- Not accessible for monitoring - hanging from cliff
- Across the street from Fort Mac Arthur Museum / Battery Osgood-Farley National Register Site
- This outfall is not safely accessible

	HUC12		JG7 WMP Area		SMBJ7-O-7/8	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	10.2	8.8
Education	806.2	3.3	32.2	3.1	15.6	13.5
Industrial	1487.5	6.2	1.0	0.1	1.2	1.0
MF Residential	2042.4	8.5	151.0	14.3	0.0	0.0
SF Residential	11265.0	46.7	561.5	53.2	33.3	28.9
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	55.1	47.8
Total	24115.1	100	1056	100	115.4	100

Site ID: SMBJ7-O-9 **GPS Coordinates:** 33.705307, -118.291571 **Description:** - Outfall diameter approximately 1.75 feet - Outfall material is corrugated metal pipe - Near the end of W. Paseo Del Mar	 

	HUC12		JG7 WMP Area		SMBJ7-O-9	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	0.0	0.0
Education	806.2	3.3	32.2	3.1	0.0	0.0
Industrial	1487.5	6.2	1.0	0.1	0.5	2.1
MF Residential	2042.4	8.5	151.0	14.3	2.9	12.3
SF Residential	11265.0	46.7	561.5	53.2	0.0	0.0
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	20.2	85.6
Total	24115.1	100	1056	100	23.6	100

Site ID: SMBJ7-O-10 **GPS Coordinates:** 33.705402, -118.290650 **Description:** - Outfall diameter approximately 2 feet - Outfall material is brick	 

	HUC12		JG7 WMP Area		SMBJ7-O-10	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	0.0	0.0
Education	806.2	3.3	32.2	3.1	0.0	0.0
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	0.8	20.8
SF Residential	11265.0	46.7	561.5	53.2	0.5	14.0
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	2.4	65.2
Total	24115.1	100	1056	100	3.7	100

Site ID: SMBJ7-O-11 **GPS Coordinates:** 33.705864, -118.288023 **Description:** - Outfall diameter approximately 2.25 feet - Outfall material is corrugated metal pipe - Near the intersection of S. Pacific Avenue and Bluff Place	

Site ID: SMBJ7-O-12 **GPS Coordinates:** 33.706292, -118.287400 **Description:** - Outfall diameter approximately 1.3 feet - Outfall material is vitrified clay pipe - Near the intersection of S. Pacific Avenue and Bluff Place	 

	HUC12		JG7 WMP Area		SMBJ7-O-11/12	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	0.0	0.0
Education	806.2	3.3	32.2	3.1	0.0	0.0
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	18.3	38.0
SF Residential	11265.0	46.7	561.5	53.2	20.7	43.0
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	9.1	19.0
Total	24115.1	100	1056	100	48.1	100

Site ID: SMBJ7-O-13 **GPS Coordinates:** 33.707872, -118.285646 **Description:** - Outfall diameter approximately 1 foot - Outfall material is polyethylene liner - Close to the end of W 40th Street, near intersection with Bluff Place	

	HUC12		JG7 WMP Area		SMBJ7-O-13	
Land Use	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Water	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	89.8	0.4	0.0	0.0	0.0	0.0
Commercial	1230.5	5.1	25.5	2.4	1.4	5.5
Education	806.2	3.3	32.2	3.1	0.0	0.0
Industrial	1487.5	6.2	1.0	0.1	0.0	0.0
MF Residential	2042.4	8.5	151.0	14.3	10.8	41.5
SF Residential	11265.0	46.7	561.5	53.2	4.5	17.3
Transportation	1956.6	8.1	0.0	0.0	0.0	0.0
Vacant	5236.9	21.7	284.3	26.9	9.3	35.7
Total	24115.1	100	1056	100	26.0	100

Attachment D

Example Calibration, Field and Chain of Custody Forms

Example Field Calibration Log Sheet

METER CALIBRATIONS/FIELD MEASUREMENTS

STN NO___________________________

Calibrated by:______________________________ Location:___________________________

Date:________________ Time:_____________

TEMPERATURE Meter MAKE/MODEL ____________________ S/N ________________ Thermister S/N _______________ Thermometer ID _______________

Lab Tested against NIST Thermometer/Thermister? N Y Date: ____________________ ±___________ °C

Measurement Location: SINGLE POINT AT _______ ft DEEP STREAMSIDE _______ FT FROM LEFT RIGHT BANK VERTICAL AVG/MEDIAN OF ________ POINTS

Field Readings #1 ________ **#2** ________ **#3** ________ **#4** _________ **#5** _________ **MEDIAN:**__________ **°C** Remark ___ ___ Qualifier ___ ___

pH Meter MAKE/MODEL ______________________ S/N __________________ Electrode No. ________________ Type: GEL LIQUID OTHER ____________

Sample: FILTERED UNFILTERED CONE SPLITTER CHURN SPLITTER SINGLE POINT AT ________ FT DEEP VERTICAL AVG. OF _____ POINTS

pH BUFFER	BUFFER TEMP	THEO-RETICAL pH FROM TABLE	pH BEFORE ADJ.	pH AFTER ADJ.	SLOPE	MILLI-VOLTS
pH 7						
pH 7						
pH 7						
pH ___						
pH ___						
pH ___						
CHECK pH ___						

TEMPERATURE CORRECTION FACTORS FOR BUFFERS APPLIED? Y N

BUFFER LOT NUMBERS :

pH 7: ____________________________

pH ____: ____________________________

CHECK pH ____: ____________________________

BUFFER EXPIRATION DATES:

pH 7: ____________________________

pH ____ : ____________________________

CHECK pH ____: ____________________________

Calibration Criteria: ± 0.2 pH units

Field Readings # 1________ **# 2**_______ **# 3**______ **# 4**______ **# 5** ______ **MEDIAN:** ________ **Units** Remark ___ ___ Qualifier ___ ___

SPECIFIC CONDUCTANCE Meter MAKE/MODEL _______________________ S/N ___________________ Sensor Type: DIP FLOW-THRU OTHER____________

Sample: CONE SPLITTER CHURN SPLITTER SINGLE POINT AT _______ ft DEEP VERTICAL AVG. OF _______ POINTS

STD VALUE	STD TEMP	SC BEFORE ADJ.	SC AFTER ADJ.	STD LOT NO	STD EXPIR-ATION DATE	COMMENTS

AUTO TEMP COMPENSATED METER ___

MANUAL TEMP COMPENSATED METER ___

CORRECTION FACTOR APPLIED? Y N

CORRECTION FACTOR= ___________

Calibration Criteria: the greater of 5 µS/cm or 3% of measured value

Field readings # 1_______ **# 2**______ **# 3**______ **# 4**______ **# 5** ______ **MEDIAN:** ________ **µS/cm** Remark ___ ___ Qualifier ___ ___

DISSOLVED OXYGEN Meter MAKE/MODEL ______________________________ S/N ____________________ Probe No. _______________________

Air Calibration Chamber in Water Air-Saturated Water Air Calibration Chamber in Air Winkler Titration Other_________________________

Sample: SINGLE POINT AT _______ ft DEEP VERTICAL AVG. OF _____ POINTS BOD BOTTLE OTHER_____________ Stirrer Used? Y N

WATER TEMP °C	BAROMETRIC PRESSURE mm Hg	DO TABLE READING mg/L	SALINITY CORR. FACTOR	DO BEFORE ADJ.	DO AFTER ADJ.

Calibration Criteria: ± 0.3 mg/L

Zero DO Check _________mg/L Adj. to _________ mg/L Date: _______________

Zero DO Solution Date__________ Thermister Check? Y N Date__________

Membrane Changed? N Y Date: _______________ Time: ____________

Barometer Calibrated? N Y Date: _______________ Time: ____________

Battery Check: REDLINE ______ RANGE _________________

Field readings # 1_______ **# 2**______ **# 3**______ **# 4**______ **# 5** ______ **MEDIAN:** ________ **mg/L** Remark ___ ___ Qualifier ___ ___

OBSERVATIONS

Weather:____

Water Color:______________________________ In Stream Activity:________________________________

Water Characteristics (flow type, odor, turbidity, floatables):_______________________________________

Other comments (trash, wildlife, recreational uses, homeless activity, etc. – Use notes section if more room is needed):

____

GENERAL INFORMATION Date: ____________________

Site ID: ________________________________ Sampling Personnel:____________________________

GPS Coordinates: (lat) ____________________ (long) ______________________ Picture/Video #: _________________

In situ **WATER QUALITY MEASUREMENTS**

Time	Temp (^{0}C)	pH	D.O. (mg/L)	Elec Cond. (uS/cm)	Turbidity (NTU)	Salinity (for ocean sampling only) (PSU)

COLLECTED WATER QUALITY SAMPLES

Sample ID	Analysis	Time	Volume	Notes
				Field blank
				Field duplicate

ADDITIONAL WATER QUALITY SAMPLING NOTES:

FLOW MEASUREMENTS WITH VELOCITY METER

Estimated Total Width of Flowing Water (ft): ____________ Distance measured from (circle): RIGHT or LEFT

Measurement Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Distance from Bank (ft)														
Depth (ft)														
Velocity (ft/s)														

FLOW MEASUREMENTS WITH FLOAT AND STOPWATCH Number of Flow Paths:______

Fill out Path # ➔	Path#	Path#	Path#	Path#	Path#
Width of Flow at **Top** of Marked Section:					
Width of Flow at **Middle** of Marked Section:					
Width of Flow at **Bottom** of Marked Section:					
Depth of Flow at 0% of **Top** Marked Section:					
Depth of Flow at 25% of **Top** Marked Section:					
Depth of Flow at 50% of **Top** Marked Section:					
Depth of Flow at 75% of **Top** Marked Section:					
Depth of Flow at 100% of **Top** Marked Section:					
Depth of Flow at 0% of **Middle** Marked Section:					
Depth of Flow at 25% of **Middle** Marked Section:					
Depth of Flow at 50% of **Middle** Marked Section:					
Depth of Flow at 75% of **Middle** Marked Section:					
Depth of Flow at 100% of **Middle** Marked Section:					
Depth of Flow at 0% of **Bottom** Marked Section					
Depth of Flow at 25% of **Bottom** Marked Section:					
Depth of Flow at 50% of **Bottom** Marked Section:					
Depth of Flow at 75% of **Bottom** Marked Section:					
Depth of Flow at 100% of **Bottom** Marked Section					
Distance Marked-off for Velocity:					
Time 1:					
Time 2:					
Time 3:					

Specify if measurements are in inches or feet using “in” or “ft”

CHAIN OF CUSTODY RECORD

Company:	Phone:	Job No.	Page _______ of _______
Project Manager:	Email:	Analysis Requested	Test Instruction & Comments
Project Name:	Project #		
Site Name: & Address:			

	Sample ID	Lab ID	Date	Time	Matrix	Container Number/Size	Pres.											
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

Sample Receipt: To Be Filled By Lab	**Turn Around Time**	Relinquished By: 1	Relinquished By: 2	Relinquished By: 3
Total Number of Containers	Normal	Signature	Signature	Signature
Custody Seals Yes No N/A	Rush	Printed Name		Printed Name
Received in Good Condition Yes No	Same Day	Date Time	Date Time	Date Time
Properly Cooled Yes No N/A	24 Hrs	Received By 1	Received By 2	Received By 3
Samples Intact Yes No N/A	48 Hrs	Signature	Signature	Signature
Samples Accepted Yes No	72 Hrs	Printed Name	Printed Name	Printed Name
		Date Time	Date Time	Date Time

CALIFORNIA
Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

Los Angeles Regional Water Quality Control Board

April 28, 2015

Dr. Shahram Kharaghani
City of Los Angeles
Department of Public Works, Bureau of Sanitation
Watershed Protection Division
1149 South Broadway, 10th Floor
Los Angeles, CA 90015

Ms. Gail Farber, Chief Engineer
Los Angeles County Flood Control District
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

APPROVAL, WITH CONDITIONS, OF THE CITY OF LOS ANGELES AREA IN SANTA MONICA BAY JURISDICTIONAL GROUP 7 SUBWATERSHED WATERSHED MANAGEMENT PROGRAM (WMP), PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT (NPDES PERMIT NO. CAS004001; ORDER NO. R4-2012-0175)

Dear Dr. Kharaghani and Ms. Farber:

On November 8, 2012, the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board or Board) adopted Order No. R4-2012-0175, *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* (hereafter, LA County MS4 Permit). Part VI.C of the LA County MS4 Permit allows Permittees the option to develop either a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to implement permit requirements on a watershed scale through customized strategies, control measures, and best management practices (BMPs). Development of a WMP or EWMP is voluntary and allows a Permittee to address the highest watershed priorities, including complying with the requirements of Part V.A (Receiving Water Limitations), Part VI.E and Attachments L through R (Total Maximum Daily Load Provisions), and by customizing the control measures in Parts III.A (Prohibitions – Non-Storm Water Discharges) and VI.D (Minimum Control Measures), except the Planning and Land Development Program. Pursuant to Part VI.C.4.c of the LA County MS4 Permit, the City of Los Angeles (City) and the Los Angeles County Flood Control District (LACFCD) jointly submitted a draft WMP for the City's land area and the LACFCD's infrastructure within Jurisdictional Group 7 (JG7) of the Santa Monica Bay (SMB) Watershed Management Area (WMA) dated June 27, 2014, to the Los Angeles Water Board for review.

Public Review and Comment

On July 3, 2014, the Board provided public notice and a 46-day period to allow for public review and comment on the City's and LACFCD'S draft WMP. A separate notice of availability regarding the draft WMPs, including the City's and LACFCD's draft WMP, was directed to State Senators and Assembly Members within the Coastal Watersheds of Los Angeles County. The Board received two comment letters that had specific comments on the City's and LACFCD's draft WMP and one letter that had comments on WMPs generally, which were in part applicable to the City's and LACFCD's draft WMP. One joint letter was from the Natural Resources Defense Council (NRDC), Heal the Bay, and Los Angeles Waterkeeper and the other letters were from the Construction Industry Coalition on Water Quality (CICWQ) and a private citizen, Joyce Dillard. On October 9, 2014, the Board held a workshop at its regularly scheduled Board meeting on the draft WMPs. The Board also held a public meeting on April 13, 2015 for Permittees and interested persons to discuss the revised draft WMPs with the Executive Officer and staff. During its initial review and its review of the revised draft WMP, the Los Angeles Water Board considered those comments applicable to the City's and LACFCD's proposed WMP.

Los Angeles Water Board Review

Concurrently with the public review, the Los Angeles Water Board, along with U.S. EPA Region IX staff, reviewed the draft WMPs. On October 27, 2014, the Los Angeles Water Board sent a letter to the City and LACFCD detailing the Board's comments on the draft WMP and identifying the revisions that needed to be addressed prior to the Board's approval of the City's and LACFCD's WMP. The letter directed the City and LACFCD to submit a revised draft WMP addressing the Los Angeles Water Board's comments. Prior to the City's and LACFCD's submittal of the revised draft WMP, Board staff had teleconferences and e-mail exchanges with City representatives to discuss the Board's comments and the revisions to the draft WMP, which would address the Board's comments. The City and LACFCD submitted a revised draft WMP on January 27, 2015, for Los Angeles Water Board review and approval.

Approval of WMP, with Conditions

The Los Angeles Water Board hereby approves, subject to the following conditions, the City's and LACFCD's January 27, 2015, revised draft WMP for the City's land area and the LACFCD's infrastructure within JG7 of the SMB WMA. The Board may rescind this approval if all of the following conditions are not met to the satisfaction of the Board within the timeframe provided below.

1. Clarify the responsibilities of the City and LACFCD for implementation of the watershed control measures in Table 3-2, "Catch Basin Retrofit Implementation Schedule" of the revised draft WMP to comply with the Santa Monica Bay Nearshore and Offshore Debris TMDL requirements.

2. Revise Table 3-1 of the revised draft WMP to include “Interagency coordination,” “Hydromodification Control Plan,” and “Sewage system maintenance, overflow, and spill prevention,” which are requirements of the LA County MS4 Permit. (See Parts VI.A.2.a.viii, VI.A.4.a.iii, and VI.D.2, among others, regarding “interagency coordination”; Part VI.D.7.c.iv regarding “Hydromodification Control Plan”; and Parts VI.D.9.h.ix and VI.D.10.c-e regarding “sewer system maintenance, overflow, and spill prevention.”)
3. In Section 5.2 of the revised draft WMP, Re-Characterization of Water Quality Priorities on page 32, delete the second criterion (second bullet point) regarding the demonstration that MS4 discharges have caused or contributed to an exceedance of receiving water limitations. The second bullet point references the criteria for listing a waterbody on the Clean Water Act section 303(d) list as impaired due to a specific pollutant, which requires a higher threshold than the threshold to determine that a MS4 discharge has caused or contributed to an exceedance of receiving water limitations. A demonstration that a MS4 discharge has caused or contributed to an exceedance of receiving water limitations can be made solely based on the criterion in the first bullet, “Simultaneously collected water samples … exceed the receiving water limitations as sampled in the receiving water and exceed the WQBELs, action levels as defined in Appendix G, or receiving water limits … at the MS4 outfall.”
4. Correct the following typographical errors in the revised draft WMP:
   a. In Section 1.2, clarify the area that is addressed by the City’s and LACFCD’s WMP, since 47 acres excluded from 1056 acres does not equal 976 acres;
   b. Table 2-1, page 7, revise the last footnote to read “Nearshore is defined as the zone bounded by the shoreline <u>and a line 1000 feet from the shoreline</u> or the 30-foot depth contours, whichever is further from the shoreline. The underlined language needs to be add to the footnote;
   c. Section 2.2, page 14, correct the reference to Section <u>VI</u>.C.5(a)ii of the Permit instead of Section IV.C.5(a)ii of the Permit;
   d. Footnote 5, page 27, the percentage referenced in the footnote does not match the percentages referenced in the text;
   e. Correct the table number for the table “Effectiveness Assessment Measures for Various Activities under the Storm Water Management Program” on page 28 to Table 3-3 (currently numbered as Table 3-2); Table 3-2 is located on page 27; and
   f. Section 4.3, page 30, correct the number of catch basins that are City owned and County owned. The current numbers in the revised draft WMP do not add up to 218 catch basins.

The City and LACFCD shall submit a final WMP to the Los Angeles Water Board that satisfies all of the above conditions no later than May 28, 2015.

Determination of Compliance with WMP

Pursuant to Part VI.C.6 of the LA County MS4 Permit, the City and LACFCD shall begin implementation of the approved WMP immediately. To continue to be afforded the opportunity to implement permit provisions within the framework of the WMP, Permittees must fully and timely implement all actions per associated schedules set forth in the approved WMP unless a modification to the approved WMP, including any extension of deadlines where allowed, is approved by the Los Angeles Water Board pursuant to Part VI.C.6.a or Part VI.C.8.a.ii-iii. The Los Angeles Water Board will determine the City's and LACFCD's compliance with the WMP on the basis of the compliance actions and milestones included in the WMP, including, but not limited to, the following:

- Section 3.1.2 "MCMs and Outcome Levels," which summarizes the Program MCMs and outcome levels that will be achieved; and
- Table 3-2 "Catch Basin Retrofit Implementation Schedule."

Pursuant to Parts VI.C.3 and VI.E.2.d.i.(4)(a) of the LA County MS4 Permit, the City's and LACFCD's full and timely compliance with all actions and dates for their achievement in their approved WMP shall constitute compliance with permit provisions pertaining to applicable WQBELs/WLAs in Part VI.E and Attachment M of the LA County MS4 Permit. Further, per Part VI.C.2.b of the LA County MS4 Permit, the City's and LACFCD's full compliance with all requirements and dates for their achievement in their approved WMP constitutes compliance with the receiving water limitations provisions of Part V.A of the LA County MS4 Permit for the specific waterbody-pollutant combinations addressed by their approved WMP.

If the City and LACFCD fail to meet any requirement or date for its achievement in the approved WMP, which will be demonstrated through the City's and LACFCD's Annual Reports and program audits (when conducted), the City and LACFCD shall be subject to the baseline requirements of the LA County MS4 Permit, including but not limited to demonstrating compliance with applicable receiving water limitations and TMDL-based WQBELs/WLAs through outfall and receiving water monitoring. See Parts VI.C.2.c and VI.E.2.d.i.(4)(c).

Annual Reporting

The City and LACFCD shall report on achievement of actions and milestones within the reporting year, as well as progress towards future milestones related to multi-year projects, through their Annual Report per Attachment E, Part XVIII of the LA County MS4 Permit. For multi-year efforts, the City and LACFCD shall include the status of the project, which includes the status with regard to standard project implementation steps. These steps include, but are not limited to, adopted or potential future changes to municipal ordinances to implement the project, site selection, environmental review and permitting, project design, acquisition of grant or loan funding and/or municipal/LACFCD approval of project funding, contractor selection, construction schedule, start-up, and effectiveness evaluation (once operational), where applicable. For all stormwater retention/infiltration projects, including LID due to new/redevelopment, green streets, and regional BMPs, the City and LACFCD shall report annually on the volume of stormwater retained in the area covered by the SMB JG7 WMP.

The City and LACFCD shall also include in their Annual Report the source(s) of funds used during the reporting year, and those funds proposed for the coming year, to meet necessary expenditures related to implementation of the actions identified in its WMP per Part VI.A.3 of the LA County MS4 Permit. Further, as part of the annual certification concerning a Permittee's legal authority required by Part VI.A.2.b of the LA County MS4 Permit, the City and LACFCD shall also certify in the Annual Report that each has the necessary legal authority to implement each of the actions and milestones in the approved WMP as required by Part VI.C.5.b.iv.(6). If a Permittee does not have legal authority to implement an action or milestone at the time the City and LACFCD submits their Annual Report, the Permittee shall propose a schedule to establish and maintain such legal authority.

Adaptive Management

The City and LACFCD shall conduct a comprehensive evaluation of its WMP no later than April 28, 2017, and subsequently, every two years thereafter pursuant to the adaptive management process set forth in Part VI.C.8 of the Los Angeles County MS4 Permit. As part of this process, the City and LACFCD must evaluate progress toward achieving:

- Applicable WQBELs/WLAs in Attachment M of the LA County MS4 Permit according to the milestones set forth in its WMP;
- Improved water quality in MS4 discharges and receiving waters;
- Stormwater retention milestones; and
- Multi-year efforts that were not completed in the current year and will continue into the subsequent year(s), among other requirements.

The City's and LACFCD's evaluation of the above shall be based on both progress implementing actions in the WMP and an evaluation of outfall-based monitoring data and receiving water data. Per Attachment E, Part XVIII.6 of the LA County MS4 Permit, the City and LACFCD shall implement adaptive management strategies, including but not limited to:

- Refinement of the Reasonable Assurance Analysis (RAA) based on data specific to the City's area and the LACFCD's infrastructure within JG7 of the SMB WMA that are collected through the City's and LACFCD's Coordinated Integrated Monitoring Program and other data as appropriate;
- Identifying the most effective control measures, why they are the most effective, and how other control measures can be optimized based on this understanding;
- Identify the least effective control measures, why they are ineffective, and how the control measures can be modified or replaced to be more effective;
- Identify significant changes to control measures during the prior year(s) and the rationale for the changes; and
- Describe all significant changes to control measures anticipated to be made in the next year(s) and the rationale for each change.

As part of the adaptive management process, any modifications to the WMP, including any requests for extension of deadlines not associated with TMDL provisions, must be submitted to the Los Angeles Water Board for review and approval. The City and LACFCD must implement any modifications to the WMP upon approval by the Los Angeles Water Board or its Executive Officer, or within 60 days of submittal of modifications if the Los Angeles Water Board or its Executive Officer expresses no objections. Note that the Permittees' Report(s) of Waste Discharge (ROWD) is due no later than July 1, 2017. To align any modifications to the WMP proposed through the adaptive management process with permit reissuance, results of the first adaptive management cycle should be submitted in conjunction with the Permittees' ROWD.

The Los Angeles Water Board appreciates the participation and cooperation of the City and LACFCD in the implementation of the LA County MS4 Permit. If you have any questions, please contact Rebecca Christmann at Rebecca.Christmann@waterboards.ca.gov or by phone at (213) 576-5734. Alternatively, you may also contact Ivar Ridgeway, Chief Storm Water Permitting Unit, at Ivar.Ridgeway@waterboards.ca.gov or by phone at (213) 620-2150.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

cc: Donna Chen, City of Los Angeles
Hubertus Cox, City of Los Angeles
Hamid Tadayon, City of Los Angeles
Angela George, Los Angeles County Flood Control District
Paul Alva, Los Angeles County Flood Control District

Watershed Management Program for Santa Monica Bay Jurisdictional Group 7 within the City of Los Angeles

May 28, 2015

Project Number 10503614

Prepared for:
City of Los Angeles
Los Angeles County Flood Control District

Prepared by:
The MWH Team

MWH. Geosyntec consultants CWE M2 Resource Consulting, Inc.

Executive Summary

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) and the Los Angeles County Flood Control District (LACFCD), collectively referred to as the SMB JG7 WMP Group, pursue a WMP to fulfill the requirements of the MS4 Permit. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural best management practice (BMP) implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). In December of 2013, the SMB JG7 WMP Group submitted a revised notice of intent to develop a WMP for the City of Los Angeles land area within JG7 of the Santa Monica Bay Watershed. This WMP, in combination with the SMB JG7 Coordinated Integrated Monitoring Program (CIMP), was prepared to satisfy Part C.1.f of the Permit, which includes the following tasks:

1. Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters within each Watershed Management Area (WMA);
2. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d;
3. Execute an integrated monitoring program and assessment program pursuant to Attachment E – MRP, Part VI to determine progress towards achieving applicable limitations and/or action levels in Attachment G;
4. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the monitoring and reporting program (MRP) to ensure that applicable WQBELs, RWLs, and other milestones set forth in the WMP are achieved in the required timeframes; and
5. 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 WMPs and EWMPs from month 6 through the date of program approval.

WATERSHED CHARACTERIZATION

The SMB JG7 WMP Group area is located within the southern portion of the 414-square mile Santa Monica Bay Watershed, including the Santa Monica Bay and land area that drains into the Bay. The boundary of the Santa Monica Bay, as defined for the National Estuary Program, extends from the Los Angeles/Ventura County line to the northwest, and southeast to Point Fermin on the Palos Verdes Peninsula. The land area that drains into the Bay follows the crest of the Santa Monica Mountains on the north to Griffith Park, extends south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek, the natural drainage is a narrow coastal strip between Playa del Rey and Palos Verdes (Regional Board, 2011).

The JG7 area includes the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, Rolling Hills Estate, and the City of Los Angeles. This WMP only addresses the 1,056-acre area owned by the City within JG7, which includes the following water bodies as identified in the Basin Plan:

- Santa Monica Bay – Nearshore Zone
- Royal Palms Beach
- White's Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

IDENTIFICATION OF WATER QUALITY PRIORITIES

The water quality prioritization process of the Permit determines the Water Body-Pollutant Combinations (WBPCs) that will be addressed within the WMP area. Section IV.C.5(a)ii of the permit defines several categories of WBPCs to be used to prioritize WBPCs in order to guide the implementation of structural and institutional BMPs: **Category 1** (highest priority) are those subject to an established Total Maximum Daily Load (TMDL); **Category 2** (high priority) are those on the State Water Resources Control Board (SWRCB) 2010 Clean Water Act (CWA) Section 303(d) list or those constituents that have sufficient exceedances to be listed; and **Category 3** (medium priority) are those with observed exceedances, but at a rate too infrequent to be listed.

A detailed monitoring data analysis was conducted to:

1. Evaluate the status of TMDL compliance;
2. Evaluate the status of 303(d) listings (i.e., whether any WBPCs meet the SWRCB's 303[d] delisting criteria);
3. Identify other WBPCs that meet 303(d) listing criteria; and
4. Identify remaining WBPCs demonstrating exceedance(s) of applicable receiving water limitations through the use of Monitoring and Bight data.

The outcome of the preliminary water quality prioritization is summarized in **Table ES-1**. WBPCs are listed in order of compliance deadline with interim and final deadlines included. There were no Category 2 or 3 WBPCs identified within the SMB JG7 WMP Group area.

Table ES-1
Water Body-Pollutant Prioritization
(Listed in order of compliance deadline, interim, and final are included.
Passed deadlines are shown in bold font)

Category	Water Body	Pollutant	Compliance Deadline
1	SMB Beaches	Summer dry weather bacteria	**7/15/2006 for single sample AEDs**
		Winter dry weather bacteria	**7/15/2009 for single sample AEDs**
		Wet weather	**7/15/2013 for single sample AEDs**[1]
			7/15/2013 for geometric mean (GM)[1]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][2,3]
		PCBs	[No compliance deadline specified in TMDL][2,3]
2	No Category 2 WBPCs have been identified at this time		
3	No Category 3 WBPCs have been identified at this time		

[1] Per Resolution 2006-008, the JG7 agencies elected to pursue a non-integrated water resources approach to SMBBB TMDL compliance, which resulted in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

[2] Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, the WLA target was set at the existing waste load, so antidegradation conditions exist.

[3] Contamination of DDT and PCBs in the sediments of the Santa Monica Bay has led to a 303(d) listing of Fish Consumption Advisory. The Santa Monica Bay TMDL for DDTs and PCBs issued in 2012 addresses the impairment to human health consumption due to DDT and PCBs in the Santa Monica Bay from Point Dume to Point Vicente and the Palos Verde Shelf from Point Vicente to Point Fermin.

REASONABLE ASSURANCE ANALYSIS

The Category 1 WBPCs identified for the JG7 SMB WMP include bacteria at the Santa Monica Bay Beaches, debris in the Santa Monica Bay Offshore/Nearshore, and polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethanes (DDTs) in the Santa Monica Bay. The three existing bacteria TMDL compliance monitoring locations (SMB 7-6, SMB 7-8, and SMB 7-9) are all open beach and antidegradation locations. SMB 7-7 has not been accessible or monitored since 2011 due to a landslide. Because the monitored locations are open beach monitoring locations, they have no definable drainage areas. As antidegradation sites, all three locations have an implied zero load reduction as compared to the reference beach. Therefore, compliance is demonstrated through a non-quantitative Reasonable Assurance Analysis (RAA). Similarly, for PCBs and DDTs the U.S. Environmental Protection Agency (USEPA) TMDL indicates that the current load for Santa Monica Bay is less than the required load; therefore, a zero load reduction is required for those parameters, demonstrating compliance though a non-quantitative RAA. Consistent with Section VI.E.5.b.i of the MS4 Permit, compliance with the Debris TMDL will be met through a phased retrofit of the City's catch basins in the SMB JG7 WMP area. The City has committed to retrofit the number of catch basins at a faster rate than required per the Regional Board implementation goals, with the goal of 100% of catch basins in the JG7 WMP area being retrofitted by July 2016. The City's Trash Monitoring and Reporting Plan (TMRP) (2012) states, *"vertical insert[s] with 5-mm openings and flow activated opening screen covers are the best suited for implementation* *within the City to achieve compliance with Trash TMDLs."* There are no industrial facilities within the SMB JG7 WMP area that use, store, transport, manufacture, or handle plastic pellets. Therefore, the City's Plastic Pellet Monitoring and Reporting Plan (PMRP) only includes an emergency response plan.

As part of the adaptive management process, and as additional monitoring data is collected as part of the approved CIMP, if a quantitative RAA utilizing BMP performance data becomes necessary, then an appropriate RAA approach would be determined at that time.

WATERSHED CONTROL MEASURES

Development of the WMP requires identification of structural or institutional BMPs expected to be sufficient to meet receiving water and effluent limitations set forth in the Permit. BMPs vary in function and type, with each BMP providing unique design characteristics and benefits from implementation. The overarching goal of BMPs in the WMP is to reduce the impact of stormwater and non-stormwater on receiving water quality.

There are currently 218 catch basins within the City of Los Angeles JG7 WMP area, with 57 planned to be retrofitted by December 2015. The remaining 161 catch basins will be retrofitted by July 2016. With the exception of these planned catch basin retrofits, which are considered to be distributed BMPs, there are no other regional or distributed structural BMPs existing or planned at this time. Through the adaptive management process, regional and/or distributed BMPs may be proposed if CIMP monitoring demonstrates that pollutant loads exceed the WQBELs or RWLs previously discussed. At this time, a quantitative RAA is not being presented due to zero load reduction requirements and alternative compliance measures.

The Permit (Parts VI.D.4 through VI.D.10) requires the implementation of new Minimum Control Measures (MCMs), while also requiring that currently implemented MCMs continue until the City of Los Angeles portion of SMB JG7 WMP is approved by the Regional Board. The existing MCMs, much like those proposed in the Permit, are comprised of six categories including:

- Public information and participation program;
- Industrial/commercial facilities program;
- Development planning program;
- Development construction program;
- Public agencies activities program; and
- Illicit connections and illicit discharges elimination program.

The Permit allows for the customization of these MCMs if proposed customizations perform at or beyond the level of effectiveness of the original requirements. At this time, the SMB JG7 WMP Group is not considering customizing MCMs.

It should be noted, however, that institutional BMPs such as street and median sweeping, storm drain inlet and conveyance system cleaning, pet waste program enhancements, etc. are assumed to result in a cumulative pollutant load reduction of up to or approximately 5%. Additionally, assuming past data also reflect future trends, it is anticipated that 0.1 – 0.2% of residential, commercial, and industrial parcels will implement low impact development (LID) annually through development or redevelopment projects[1].

[1] 0.1-0.2% annual estimate is based on the area-weighted projected development/redevelopment rate for residential, commercial, and industrial land uses reported by the City of Los Angeles in the Ballona Creek TMDL Implementation Plan.

Although RWLs are currently being met, it is anticipated that implementation of LID will further enhance the water quality in this region.

ADAPTIVE MANAGEMENT PROCESS

The WMP will be implemented as an adaptive program. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time. The steps involved in the adaptive management process are as follows:

1. Re-characterization of water quality priorities;
2. Source assessment re-evaluation;
3. Effectiveness assessment of watershed control measures; and
4. Updated Reasonable Assurance Analysis (RAA).

The adaptive management process provides a framework for the WMP to be a dynamic tool that remains relevant going forward. This process is repeated every two years following the final approval of the WMP.

SCHEDULE

The Notice of Intent submitted to the Regional Board in December 2013 provided a schedule of interim milestones for the development of the WMP and CIMP. At this time, the SMB JG7 WMP Group does not anticipate any deviations from the schedule. Completed milestones and projected completion dates for future milestones are presented in **Table ES-2.**

The compliance deadlines in the Santa Monica Bay Beaches Bacteria TMDL are currently in effect for SMB 7-6, SMB 7-8, and SMB 7-9. The TMDL for PCBs and DDTs does not include a compliance schedule for the WLAs for the SMB WMA, but because the WLAs were set based on the existing loads, the SMB WMA is considered to be in compliance. Therefore, a compliance schedule for the PCBs and DDTs TMDL is not being proposed at this time. The catch basin retrofit schedule for compliance with the Debris TMDL has been included in **Table ES-2**.

Table ES-2
WMP Schedule of Interim and Final Milestones

Deliverable	Planned Date of Completion
Submit Revised Final Draft WMP to the Regional Board	January 2015
Submit Final Draft CIMP to the Regional Board	June 2014
Submit Revised Final CIMP to the Regional Board	April 2015
57 catch basin opening cover and/or insert retrofits (cumulative) (26% of load reduced)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (100% of load reduced)	July 2016

Table of Contents

Section Name **Page Number**

Executive Summary **ES-1**
1 Introduction **1**
1.1 Background and Regulatory Framework 1
1.2 SMB JG7 WMP Group Geographical Area 2
1.3 Watershed Management Program Development Process 5
1.4 Watershed Management Program Overview 5
2 Identification of Water Quality Priorities **6**
2.1 Water Quality Characterization 6
2.1.1 Water Quality Objectives/Criteria 7
2.1.2 QA/QC Criteria 10
2.1.3 Detailed Data Analysis 10
2.1.4 TMDL Compliance Status 10
2.1.5 Other Water Body-Pollutant Combinations that meet 303(d) Listing Criteria 14
2.1.6 Remaining Water Body-Pollutant Combinations Demonstrating Exceedance(s) of Applicable Receiving Water Limitations 14
2.2 Water Body-Pollutant Prioritization 14
2.2.1 Category 1 – Highest Priority 15
2.2.2 Category 2 – High Priority 16
2.2.3 Category 3 – Medium Priority 17
2.3 Source Assessment 17
2.3.1 Indicator Bacteria 17
2.3.2 DDT and PCBs 19
3 Watershed Control Measures **20**
3.1 Minimum Control Measures/Institutional BMPs 20
3.1.1 Customization of MCMs 24
3.1.2 MCMs and Outcome Levels 25
3.1.3 Next Steps to MCM Customization 27
4 Reasonable Assurance Analysis **29**
4.1 Bacteria 29
4.2 PCBs and DDTs 29
4.3 Debris and Plastic Pellets 30

RB-AR17059

Table of Contents

5 Adaptive Management Process.......31

5.1 Compliance Schedule.......31

5.2 Re-Characterization of Water Quality Priorities.......32

5.3 Source Assessment Re-evaluation.......32

5.4 Effectiveness Assessment of Watershed Control Measures.......33

5.5 Update of Reasonable Assurance Analysis.......33

6 References.......35

Attachment A: Santa Monica Bay Shoreline Monitoring Data within SMB JG7 WMP Group Area

Attachment B: Documentation of Authority

List of Acronyms

Acronym	Definition
AED	Allowable Exceedance Day
ASBS	Areas of Special Biological Significance
Basin Plan	Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
BIOL	Preservation of Biological Habitats of Special Significance Beneficial Use Designation
BMP	Best Management Practice
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIMP	Coordinated Integrated Monitoring Program
City	City of Los Angeles
COMM	Commercial and Sport Fishing Beneficial Use Designation
CSMP	Coordinated Shoreline Monitoring Plan
CWA	Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
ED	Exceedance Day
EMC	Event Mean Concentration
ES	Executive Summary
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment Control Plan
EWMP	Enhanced Watershed Management Program
FC	Fecal Coliform
FIB	Fecal Indicator Bacteria
g/yr	Grams per Year

List of Acronyms

Acronym	Definition
GM	Geometric Mean
IC/ID	Illicit Connections and Illicit Discharges
IND	Industrial Service Supply Beneficial Use Designation
JG	Jurisdictional Group
JG7	Jurisdictional Group 7 of the City of Los Angeles
L-SWPPP	Local Storm Water Pollution Prevention Plan
LACFCD	Los Angeles County Flood Control District
LFD	Low-Flow Diversion
LID	Low Impact Development
MAR	Marine Habitat Beneficial Use Designation
MCM	Minimum Control Measure
mg/l	Milligrams per Liter
MIGR	Migration of Aquatic Organisms Beneficial Use Designation
MPN/mL	Most Probable Number of Organisms per Milliliter
MRP	Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
NA	Not Applicable
NAICS	North American Industry Classification System
NAV	Navigation Beneficial Use Designation
ND	Non-Detects
NPDES	National Pollutant Discharge Elimination System
PCB	Polychlorinated Biphenyl
Permit	Los Angeles Regional Water Quality Control Board Order No. R4-2012-0175
PIPP	Public Information and Participation Program
PMRP	Plastic Pellet Monitoring and Reporting Program
POTW	Publically-Owned Treatment Works
QA/QC	Quality Assurance/Quality Control
RAA	Reasonable Assurance Analysis
RARE	Rare, Threatened, or Endangered Species Beneficial Use Designation

List of Acronyms

Acronym	Definition
Regional Board	Los Angeles Regional Water Quality Control Board
RWL	Receiving Water Limitation
SCCWRP	Southern California Coastal Water Research Project
SHELL	Shellfish Harvesting Beneficial Use Designation
SIC	Standard Industrial Classification
SMB	Santa Monica Bay
SMBB	Santa Monica Bay Beaches
SMB JG7 WMP Group	Santa Monica Bay Jurisdictional Group 7 Watershed Management Program Group
SMB WMA	Santa Monica Bay Watershed Management Area
SPWN	Spawning, Reproduction, and/or Early Development Beneficial Use Designation
SQMP	Stormwater Quality Management Plan
SUSMP	Standard Urban Stormwater Mitigation Plan
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
TMRP	Trash Monitoring and Reporting Plan
USEPA	United States Environmental Protection Agency
WBPC	Water Body-Pollutant Combination
WDID	Waste Discharger Identification
WILD	Wildlife Habitat Beneficial Use Designation
WMA	Watershed Management Area
WMP	Watershed Management Program
WQBEL	Water Quality-Based Effluent Limitation

1 Introduction

1.1 Background and Regulatory Framework

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. R4-2012-0175 (Permit) was adopted November 8, 2012 by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City) has been a participating agency of Jurisdictional Group 7 (JG7) of the Santa Monica Bay Watershed since the adoption of the Santa Monica Bay Beaches Bacteria Total Maximum Daily Loads (TMDLs) in 2003. However, the City of Los Angeles and the other MS4 permittees in JG7 could not reach an agreement for a collaborative approach to satisfying the requirements of the MS4 permit. Therefore, on November 26, 2013 the Regional Board requested that the City and the Los Angeles County Flood Control District (LACFCD), collectively referred to as the Santa Monica Bay JG7 WMP Group (SMB JG7 WMP Group), pursue a WMP instead of an EWMP. The primary reasons for this request included: 1) MS4 discharges to Santa Monica Bay are anticipated to be minimal due to the small contributing drainage areas; and 2) opportunities for structural best management practice (BMP) implementation are limited due to the geography of the WMP area (e.g., cliffs at outfalls, landslide and liquefaction hazards, etc.). In December of 2013, the SMB JG7 WMP Group submitted a revised Notice of Intent to develop a WMP for the City of Los Angeles land area within the JG7 area to fulfill the requirements of the Permit.

This WMP, in combination with the JG7 Coordinate Integrated Monitoring Program (CIMP), was prepared to satisfy Part C.1.f of the Permit, which includes the following tasks:

1. Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters within each Watershed Management Area (WMA);
2. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d;
3. Execute an integrated monitoring program and assessment program pursuant to Attachment E – MRP, Part VI to determine progress towards achieving applicable limitations and/or action levels in Attachment G;
4. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the monitoring and reporting program (MRP) to ensure that applicable WQBELs, RWLs and other milestones set forth in the WMP are achieved in the required timeframes; and
5. 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 WMPs and EWMPs from month 6 through the date of program approval.

1.2 SMB JG7 WMP Group Geographical Area

The SMB JG7 WMP Group area is located within the southern portion of the Santa Monica Bay WMA, which encompasses an area of approximately 414 square miles and includes the Santa Monica Bay and land area that drains into the Bay. The boundary of the Santa Monica Bay, as defined for the National Estuary Program, extends from the Los Angeles/Ventura County line to the northwest, southeast toward Point Fermin located on the Palos Verdes Peninsula. The land area that drains into the Bay follows the crest of the Santa Monica Mountains on the north to Griffith Park; then extends south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek, the natural drainage is a narrow coastal strip between Playa del Rey and Palos Verdes (Regional Board, 2011). **Figure 1-1** depicts the location of the SMB JG7 WMP Group within the Santa Monica Bay Watershed.

The full JG7 area includes the Cities of Rancho Palos Verdes, Palos Verdes Estate, Rolling Hills, Rolling Hills Estate, and the City of Los Angeles. This SMB JG7 WMP only addresses the area owned by the City and LACFCD within JG7, which includes the following water bodies as listed in the Basin Plan:

- Los Angeles County Coastal Nearshore Zone
- Royal Palms Beach
- Whites Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

The SMB JG7 WMP area, which consists of land owned by the City and includes any LACFCD infrastructure, totals approximately 1,056 acres, which is approximately 9% of the entire JG7 area within the Santa Monica Bay Watershed. **Figure 1-1** illustrates the extent of the SMB JG7 WMP Group Area. The geographical scope of the SMB JG7 WMP Group area excludes areas of land totaling approximately 47 acres for which the MS4 permittees do not have jurisdiction, including land owned by the Los Angeles Air Force Base Pacific Crest Housing Area. With the exclusion of these areas, the SMB JG7 WMP area covers 1,009 acres. The majority of the land uses within the WMP area consist of residential (approximately 67%) and vacant/open space (approximately 27%), with the remaining area consisting of a mixture of commercial, educational, and industrial land uses (**Table 1-1**). There are no designated transportation or agricultural land uses in the WMP area. The open space area includes 102 acres of restored coastal sage scrub habitat and hiking trails located within the White Point Nature Preserve.

Table 1-1
SMB JG7 WMP Land Use Summary

Land Use	% of Total
Commercial	2%
Industrial	0.1%
Education	3%
Multi-Family Residential	14%
Single Family Residential	53%
Open Space	27%
Total	100%

Introduction

The City of Los Angeles JG7 WMP area includes 218 catch basins and 13 storm drain outfalls owned and operated by either the City of Los Angeles or the LACFCD. The majority of the storm drain outfalls in the SMB JG7 WMP area are circular pipes extending from the cliff side, around one hundred feet above the rocky shoreline. The majority of the outfalls themselves are inaccessible at the pipe outlet.

The coastline along, and several inland sites within, the SMB JG7 WMP area is characterized as being subject to landslide and liquefaction hazards (City of Los Angeles Bureau of Engineering, 2014). This characterization was exemplified by the destruction of the SMB 7-7 TMDL shoreline monitoring site due to landslide in 2011.

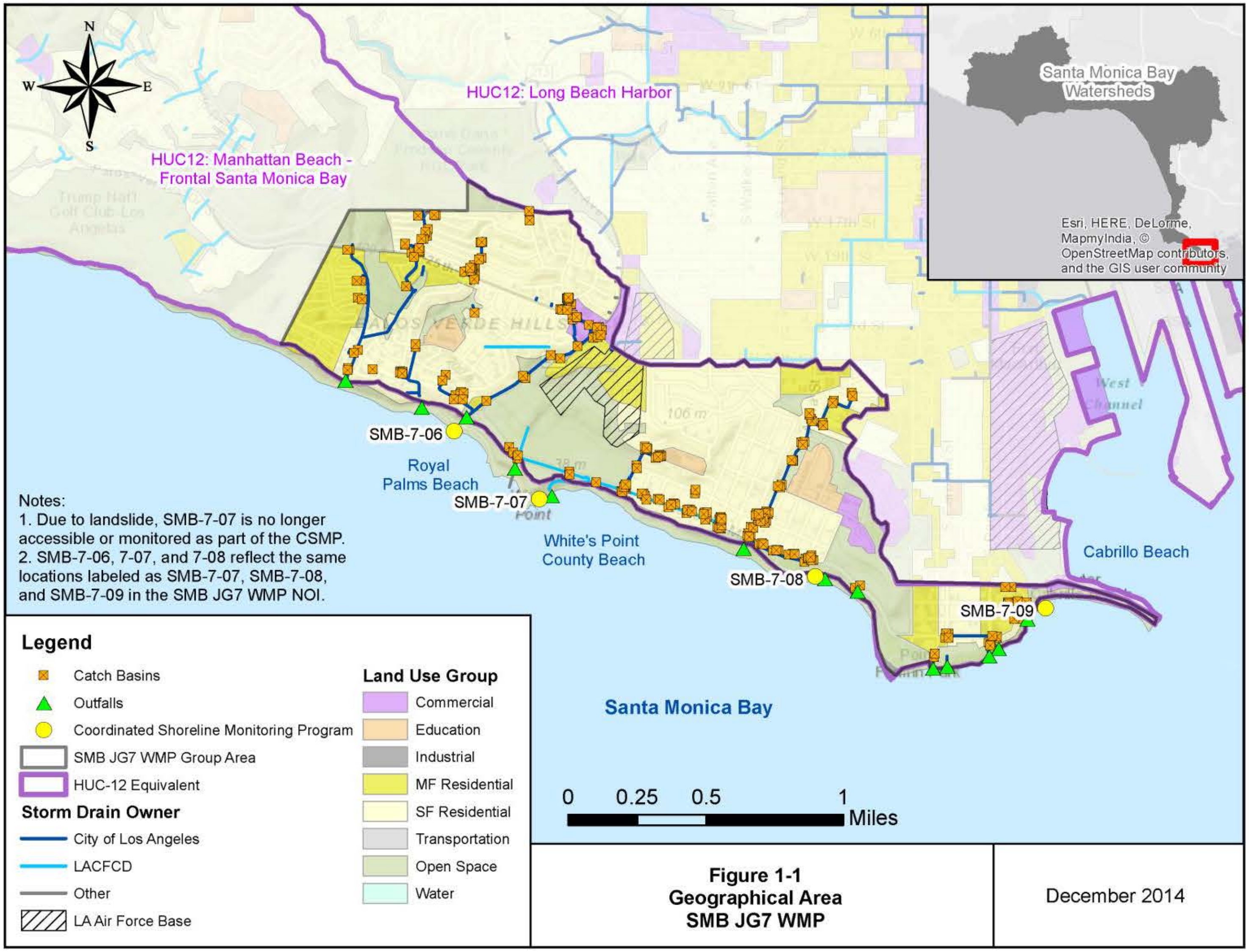


Figure 1-1
Geographical Area
SMB JG7 WMP

December 2014

1.3 Watershed Management Program Development Process

The WMP for the SMB JG7 WMP Group includes four major components, as follows:

1. **Water Quality Priorities:** The identification of water quality priorities is an important first step in the WMP process. Water quality priorities, described in Section 2, are defined for individual constituents within a specific water body, termed as Water Body-Pollutant Combinations (WBPCs). Categories of the WBPCs are defined in the Permit. Priorities are assigned to the WBPCs based on the categorization. The water quality priorities will provide the basis for prioritizing implementation activities within the WMP.

2. **Watershed Control Measures/Minimum Control Measures:** Development of the WMP requires identification of control measures/BMPs, as described in Section 3, expected to be sufficient to meet receiving water and effluent limitations set forth in the MS4 Permit (Regional Board, 2012). BMPs vary in function and type, with each BMP providing unique design characteristics and benefits from implementation. The overarching goal of BMPs in the WMP is to reduce the impact of stormwater and non-stormwater runoff on receiving water quality.

3. **Reasonable Assurance Analysis:** A key element of each WMP is the reasonable assurance analysis (RAA), described in Section 4, which is used to demonstrate *"…that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term"* (Section C.5.b.iv.(5), page 63). The Permit prescribes the RAA as a quantitative demonstration that control measures, specifically BMPs, will be effective. In other words, the RAA not only demonstrates the cumulative effectiveness of BMPs to be implemented, but it also supports their selection. However, due to current zero target load reductions and alternative compliance measures for the identified WBPCs, a quantitative analysis is not necessary at this time. Therefore, the SMB JG7 WMP group has decided to present a qualitative RAA discussion, acknowledging that a quantitative RAA may become necessary in the future based on results of future CIMP monitoring.

4. **Adaptive Management Process:** The WMP is intended to be implemented as an adaptive program as described in Section 5. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time.

1.4 Watershed Management Program Overview

This WMP has been prepared to outline the steps that will be taken by the SMB JG7 WMP Group in compliance with the requirements and deadlines set forth within the MS4 Permit. This document is organized into the following sections:

- **Section 1 –** Introduction
- **Section 2** – Identification of Water Quality Priorities
- **Section 3** – Watershed Control Measures
- **Section 4** – Reasonable Assurance Analysis Approach
- **Section 5** – Adaptive Management Process
- **Section 6** – References

2 Identification of Water Quality Priorities

To develop the WMP, the Permit requires that SMB JG7 WMP Group establish water quality priorities within each WMA. In accordance with the Permit Section IV.C.5(a), this section characterizes the water quality conditions within the SMB JG7 WMP area, identifies water quality priorities, determines water body-pollutant classifications, and assesses pollutant sources. The water quality priorities identified in this section provide the basis for prioritizing project implementation; selecting and scheduling BMPs (if needed); and focusing monitoring activities developed in the CIMP.

2.1 Water Quality Characterization

Figure 2-1 identifies the receiving waters in the SMB JG7 WMP Group area, as depicted in the Water Quality Control Plan, Los Angeles Region (Basin Plan) (Regional Board, 1995, Updated 2011). **Table 2-1** summarizes the beneficial uses for each of these water bodies, as designated in the Basin Plan. As beneficial uses designated as "potential" have not yet been established, these uses will not be evaluated further in the WMP. The SMB JG7 WMP Group area includes the water bodies listed below.

- Los Angeles County Coastal Nearshore Zone
- Royal Palms Beach
- Whites Point County Beach
- Point Fermin Park Beach (not listed in Basin Plan)

Beneficial use designations for these water bodies include the following:

- **Water Contract Recreation (REC-1):** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2):** Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- **Industrial Services Supply (IND):** Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, firs protection, or oil well re-pressurization.
- **Navigation (NAV):** Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
- **Commercial and Sport Fishing (COMM):** Uses of water for commercial or recreational collection of fish, shellfish, or other organisms intended for human consumption or bait purposes.
- **Marine Habitat (MAR):** Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

- **Preservation of Biological Habitats (BIOL):** Uses of water that support designated areas of habitats, such as Areas of Special Biological Significance (ASBS), established refuges, parks, sanctuaries, ecological reserves, or other areas where the preservation or enhancement of natural resources requires special protection.
- **Migration of Aquatic Organisms (MIGR):** Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
- **Spawning, Reproduction, and/or Early Development (SPWN):** Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
- **Shellfish Harvesting (SHELL):** Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.
- **Wildlife Habitat (WILD):** Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- **Rare, Threatened, or Endangered Species (RARE):** Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

Table 2-1
Beneficial Uses of Water Bodies and Coastal Features Designated in the Basin Plan

Water Body (and Tributaries)	Beneficial Uses											
	REC-1	REC-2	WILD	RARE	IND	NAV	COMM	MAR	BIOL	MIGR	SPWN	SHELL
Los Angeles County Coastal Nearshore Zone^	E	E	E	Ee	E	E	E	E	Ean	Ef	Ef	E
Royal Palms Beach	E	E	E			E	E	E			P	E
Whites Point County Beach	E	E	E			E	E	E			P	E
Point Fermin Park Beach	Not listed in Basin Plan											

E = Existing beneficial use

P = Potential beneficial use

e = One or more rare species utilizes all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f = Aquatic organisms utilize all bays, estuaries, lagoons, and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas that are heavily influenced by freshwater inputs.

an = Point Fermin Marine Life Refuge

^ = Nearshore is defined as the zone bounded by the shoreline and a line 1,000 feet from the shoreline or the 30-foot depth contours, whichever is further from the shoreline. Longshore extent is from Rincon Creek to the San Gabriel River Estuary.

2.1.1 Water Quality Objectives/Criteria

The Clean Water Act (CWA) requires that the State Water Resources Control Board (SWRCB) and Regional Boards conduct a water quality assessment that addresses the condition of its surface waters [required in Section 305(b) of the CWA] and provides a list of impaired waters [required in CWA Section 303(d)] that is then submitted to the U.S. Environmental Protection Agency (USEPA) for review and approval. The 2010 Integrated Report and updated 303(d) list were approved by the SWRCB on August 4, 2010 and by the USEPA on October 11, 2011. The 2010 303(d)-listed water bodies and associated pollutants within the SMB JG7 WMP Group area are summarized in **Error! Reference source not found.**.

Table 2-2
2010 303(d)-Listed Water Bodies in the SMB JG7 WMP Group Area

Water Body	Pollutant Class	Pollutant	Notes
Santa Monica Bay Beaches	Pathogens	Coliform Bacteria	Addressed by Bacteria TMDL
	Pesticides	DDT	Addressed by PCB/DDT TMDL
	Other Organics	PCBs	Addressed by PCB/DDT TMDL
Santa Monica Bay (Los Angeles County Coastal Nearshore Zone)	Trash	Debris Plastic Pellets	Addressed by Debris TMDL
	Pesticides	DDT (tissue & sediment)	Addressed by PCB/DDT TMDL
	Other Organics	PCBs (tissue & sediment)	Addressed by PCB/DDT TMDL
	Toxicity	Sediment Toxicity	Addressed by PCB/DDT TMDL
	Miscellaneous	Fish Consumption Advisory	Addressed by PCB/DDT TMDL

Water bodies are subject to water quality objectives in the Basin Plan, or Basin Plan Amendments, such as those to implement TMDLs. There are currently three TMDLs in effect for the water bodies within the SMB JG7 WMP Group area as listed in Attachment M of the Permit. These TMDLs are summarized in **Table 2-3**.

Table 2-3
Santa Monica Bay TMDLs

TMDL Name	Agency	Effective Date
SMB Beaches Bacteria TMDL, Reconsideration of Certain Technical Matters of the SMB Beaches Bacteria TMDL, Resolution R12-007	Regional Board	Effective July 2, 2014
SMB TMDL for DDT and PCBs	USEPA	March 26, 2012
SMB Nearshore Debris TMDL, Resolution R10-010	Regional Board	March 20, 2012
SMB Beaches Bacteria TMDL, Dry Weather, Resolution 2002-004[a]	Regional Board	July 15, 2003
SMB Beaches Bacteria TMDL, Wet Weather, Resolution 2002-022[a]	Regional Board	July 15, 2003

[a] This TMDL was revised pursuant to Resolution R12-2007.

RB-AR17071

Table 2-4 identifies the applicable WQBELs and/or RWLs established pursuant to TMDLs included in Attachment M of the Permit. The water quality objectives as listed in the Basin Plan are also applicable to water bodies based on the designated beneficial uses. The Debris TMDL final WQBELs are effective March 20, 2020. The effective date of the polychlorinated biphenyl (PCB) and dichlorodiphenyltrichloroethane (DDT) final WQBELs will be specified later in this document, since the USEPA-developed TMDL lacks a compliance schedule. The Bacteria TMDL final WQBELs and RWLs are currently effective for both dry weather and wet weather[2].

Table 2-4
Final Permit RWLs and WQBELs for SMB TMDLs

Reference	Parameter	Effluent Limitation/ Receiving Water Limitation
SMB Nearshore Debris TMDL	Trash – WQBEL	Zero
	Plastic Pellets – WQBEL	Zero
TMDL for PCBs/DDTs (for LA County MS4)	DDT – WLA	27.08 g/yr (based on 3-year averaging period)[2]
	PCBs – WLA	140.25 g/yr (based on 3-year averaging period)[2]
SMB Beaches Bacteria TMDL	Total coliform (daily maximum) – WQBEL	10,000 Most Probable Number (MPN)/100 mL
	Total coliform (daily maximum), if the ratio of fecal-to-total coliform exceeds 0.1 – WQBEL	1,000 MPN/100 mL
	Fecal coliform (daily maximum) – WQBEL	400 MPN/100 mL
	Enterococcus (daily maximum) – WQBEL	104 MPN/100 mL
	Total coliform (geometric mean[1]) – WQBEL/RWL	1,000 MPN/100 mL
	Fecal coliform (geometric mean[1]) – WQBEL/RWL	200 MPN/100 mL
	Enterococcus (geometric mean[1]) – WQBEL/RWL	35 MPN/100 mL

[1]The rolling 30-day geometric mean is calculated based on the previous 30 days. The reopened 2012 TMDL, which has been approved by USEPA, modified this to weekly calculation of a rolling six-week geometric mean using five or more samples, starting all calculation weeks on Sunday.
[2]Group load-based WQBELs that apply to all SMB MS4 dischargers; the individual load-based WQBELs for SMB JG7 WMP Group members would be an area-weighted fraction of this.
MPN/ml = most probable number of organisms per milliliter

Grouped RWLs for the Santa Monica Bay Beaches Bacteria TMDL are also expressed in the Permit in terms of allowable exceedance days (AEDs), which vary by season and by Coordinated Shoreline Monitoring Plan (CSMP) monitoring station. AEDs applicable to SMB 7-6, 7-7, 7-8 and 7-9 are summarized and discussed in **Table 2-6**, presented in the following Section 2.1.4.

[2] Per Resolution 2006-008, the J7 agencies elected to pursue a non-integrated water resources approach to SMB Beaches Bacteria TMDL compliance, which results in a final wet weather compliance deadline of at most 10 years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

2.1.2 QA/QC Criteria

Quality assurance/quality control (QA/QC) criteria have been established to verify that data referenced in this water body characterization are qualified for use. All data used have either been peer reviewed; were submitted as part of an official record, such as in an agency's Annual Report to the Regional Board; or have met QA/QC criteria established by another party, such as the County, City Environmental Health Division, Regional Board, or California Environmental Data Exchange Network (CEDEN), which includes the Bight Program. Data not meeting these criteria have not been used in this water body characterization.

2.1.3 Detailed Data Analysis

A detailed monitoring data analysis was conducted to:

1. Evaluate the status of TMDL compliance;
2. Evaluate the status of 303(d) listings (i.e., whether any WBPCs meet the SWRCB's 303[d] delisting criteria);
3. Identify other WBPCs that meet 303(d) listing criteria; and
4. Identify remaining WBPCs demonstrating exceedance(s) of applicable receiving water limitations.

Monitoring data analyzed are summarized in **Table 2-5**, and existing monitoring stations are shown in **Figure 2-1**. It should be noted that the data presented are receiving water quality data and do not imply MS4 contributions.

Table 2-5
Existing Monitoring Programs

Program Name	Monitoring Period	Monitoring Locations	Parameters Analyzed	Frequency
Coordinated Shoreline Monitoring Program	2004-2013	Santa Monica Bay Beaches	Bacteria	Weekly
Southern California Bight Regional Monitoring	1994 - 2013	Santa Monica Bay Offshore/Nearshore	General suite in 1995 and 1998; General suite in sediment only in 2003 and 2008	Varies by site

2.1.4 TMDL Compliance Status

Error! Reference source not found. summarizes the shoreline monitoring bacteria data from 2003 through 2013 with respect to the number of exceedance days (EDs) at SMB-7-06, SMB-7-07, SMP-7-08 and SMB-7-09, as defined in the TMDL (exceeding one of four single sample daily maximum REC-1 WQOs). Three sites are open beach locations, and as such, any exceedance is not necessarily directly attributable to the MS4. Access to SMB-7-07 was destroyed in a landslide in 2011 and has not been accessible or monitored since 2011. Geometric mean exceedance days are also reported here. A summary of the average, median, minimum, and maximum water quality results from single-sample monitoring at SMB 7-06, SMB-7-07, SMB-7-08, and SMB 7-09 is included in Attachment A. If follow-up samples were collected for weekly sites then those were included in this analysis, which may increase the number of reported EDs. As shown in **Error! Reference source not found.**, the summer dry weather AEDs were exceeded eight out of the eleven years monitored (73%) at SMB 7-6, four out of the seven years monitored (57%) at SMB 7-7, three out of the eleven years monitored (27%) at SMB-7-8, and four out of the nine years monitored (44%) at SMB 7-9. The winter dry weather AEDs were exceeded six out of the eleven years monitored (55%) at SMB 7-6, two out of the seven years monitored (30%) at SMB 7-7, one out of the eleven years monitored (9%) at SMB-7-8, and two out of the nine years monitored (22%) at SMB 7-9. The wet weather AEDs were exceeded four out of the eleven years monitored (36%) at SMB 7-6, five out of the seven years monitored (71%) at SMB 7-7, two out of the eleven years monitored (18%) at SMB-7-8, and four out of the nine years monitored (44%) at SMB 7-9. With respect to geomeans, the zero AEDs were exceeded nine out of the eleven years monitored (82%) at SMB 7-6, two out of the seven years monitored (29%) at SMB 7-7, two out of the eleven years monitored (18%) at SMB-7-8, and three out of the nine years monitored (33%) at SMB 7-9. It should be noted that 2005 recorded the most annual rainfall in Los Angeles County history (34 inches), which likely contributed to the abnormal number of exceedances. Additionally, 7-9 was monitored daily, rather than weekly, in 2005, and total coliform at SMB 7-6 was monitored daily between 2003 and 2006.

USEPA's Santa Monica Bay DDTs and PCBs TMDL (USEPA, 2012) relies on a limited dataset to establish stormwater load allocations, relying on a single study (Curren *et al*, 2011) from a single creek (Ballona Creek, which is outside the SMB JG7 WMP area) to extrapolate MS4 wasteload allocations to other SMB watersheds based on percent urban area. The Santa Monica Canyon, Ballona Creek, and Hermosa Beach watersheds combined represent 94% of the developed area draining to Santa Monica Bay. The TMDL does not present sufficient data to differentiate or disaggregate MS4 contributions by subwatershed to the DDT and PCB concentrations observed in Santa Monica Bay.

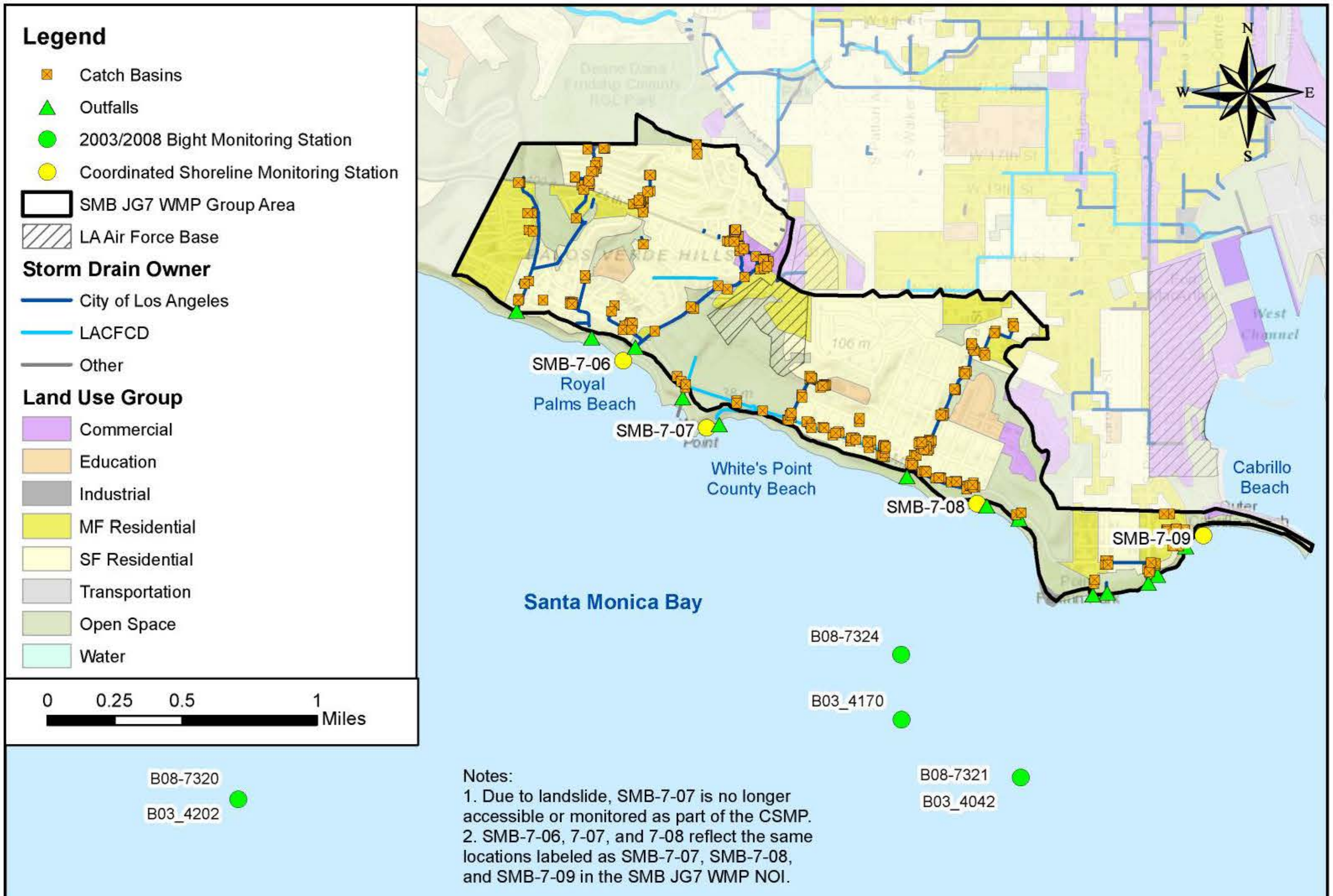


Figure 2-1
Existing Monitoring Stations
SMB JG7 WMP

December 2014

Table 2-6
Summary of Exceedance Days
(bold text signifies Exceedance Days > Allowable Exceedance Days)

Station (type)	Season	AEDs	Number of Exceedance Days per TMDL Year										
			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SMB-7-6 (open beach)	Dry-Summer[a]	0	**1**	**1**	**1**	**2**	0	**2**	0	**1**	0	**1**	**1**
	Dry-Winter[b]	1	**3**	1	**11**	1	**2**	0	**5**	1	**2**	**2**	0
	Wet[c]	1[d]	1	1	**28**	1	0	**2**	1	**3**	**2**	1	0
	Geomean[e]	0	**4**	**2**	**10**	0	**1**	**1**	**7**	**5**	**3**	**8**	0
SMB-7-7	Dry-Summer[a]	0	-	**1**	0	**1**	**4**	0	**2**	0	No data – site destroyed by landslide		
	Dry-Winter[b]	1	-	0	0	0	**4**	1	1	**3**			
	Wet[c]	1	-	1	**12**	**6**	**2**	**5**	**9**	0			
	Geomean[e]	0	-	0	0	0	0	**2**	**1**	0			
SMB-7-8 (open beach)	Dry-Summer[a]	0	**1**	**1**	0	0	0	0	0	0	0	**3**	0
	Dry-Winter[b]	1	0	0	**2**	0	0	0	1	0	1	0	0
	Wet[c]	1[d]	0	0	**13**	0	0	0	1	0	**2**	1	0
	Geomean[e]	0	0	0	**3**	0	0	0	**1**	0	0	0	0
SMB-7-9 (open beach)	Dry-Summer[a]	0	-	-	0	**1**	**3**	**1**	0	0	**1**	0	0
	Dry-Winter[b]	1	-	-	0	**2**	0	0	1	1	**2**	0	0
	Wet[c]	1	-	-	**15**	0	0	**5**	1	**3**	**7**	0	0
	Geomean[e]	0	-	-	**1**	0	0	**3**	0	0	**2**	0	0

[a] Summer Dry Weather = April 1 – October 31
[b] Winter Dry Weather = November 1 – March 31
[c] Wet Weather = November 1 – October 31, days with >=0.1 inches of rain and the three days following
[c] 2012-2013 dataset is incomplete and ends on 9/18/2013.
[d] AEDs are based on weekly sampling. Exceedance days were calculated based on the raw data. For example, in cases where more than one sample was collected in a single week, those results were still compared against the weekly AEDs. This approach is consistent with annual monitoring reports, but overestimates actual exceedance weeks.
[e] Geometric means (geomeans) were calculated using the direction in Resolution No. 12-007, calculated weekly as a rolling geometric mean using 5 or more samples, for 6 week periods starting all calculation weeks on Sunday.

2.1.5 Other Water Body-Pollutant Combinations that meet 303(d) Listing Criteria

The offshore Bight sediment data in this area are not considered to be representative of the MS4 discharges, due to distance from the outfalls and given the sample proximities to the Palos Verdes Shelf Superfund site. However, if a comparison were to be made to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, which requires a minimum sample size of 16 for toxicants and 26 for conventional or other pollutants for new listings, the Bight data for each of the monitoring stations depicted in Figure 2-1 do not include a qualifying number of samples (sample size at each location is between 3 and ten for all parameters.)

Therefore, there were no WBPCs identified within the SMB JG7 WMP geographical scope that were found to meet the 303(d) listing criteria.

2.1.6 Remaining Water Body-Pollutant Combinations Demonstrating Exceedance(s) of Applicable Receiving Water Limitations

In addition to PCBs and DDTs, the Bight data also analyzed the following parameter suites: metals, nutrients, PAHs, and organochlorine pesticides. However, due to the distance from the MS4 outfall and proximity to the Palos Verdes Shelf Superfund site which is dominated by historic discharges from the LA County Sanitary Sewer System (LACSD) outfall, this data cannot be used to draw conclusions about impact of MS4 discharges on the Santa Monica Bay.

2.2 Water Body-Pollutant Prioritization

Based on the water quality characterization, the WBPCs identified in **Table 2-7** have been classified into one of three categories, in accordance with Section VI.C.5(a)ii of the Permit. This categorization is intended to prioritize WBPCs in order to guide the implementation of structural and institutional BMPs.

Table 2-7
Water Body Pollutant Prioritization
(Listed in order of compliance deadline, interim and final are included.
Passed deadlines are shown in bold font)

Category	Water Body	Pollutant	Compliance Deadline
1	SMB Beaches	Summer dry weather bacteria	**7/15/2006 for single sample AEDs**
		Winter dry weather bacteria	**7/15/2009 for single sample AEDs**
		Wet weather bacteria	**7/15/2013 for single sample AEDs[1]**
			7/15/2013 for geometric mean (GM)[1]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction)
			3/20/2017 (40% load reduction)
			3/20/2018 (60% load reduction)
			3/20/2019 (80% load reduction)
			3/20/2020 (100% load reduction)
	SMB	DDTs	[No compliance deadline specified in TMDL][2,3]
		PCBs	[No compliance deadline specified in TMDL][2,3]
2	No Category 2 WBPCs have been identified at this time		
3	No Category 3 WBPCs have been identified at this time		

[1] Per Resolution 2006-008, the J7 agencies elected to pursue a non-integrated water resources approach to SMB Beaches Bacteria TMDL compliance, which results in a final wet weather compliance deadline of at most 10-years, or July 15, 2013. http://63.199.216.6/larwqcb_new/bpa/docs/2006-008/2006-008_RB_RSL.pdf

[2] Although the TMDL lacks a formal compliance schedule for the WLAs, Table 6-5 of the TMDL does specify a timeline for the DDT/PCB targets in water and sediment. Additionally, the WLA target was set at existing waste load, so antidegradation conditions exist.

[3] Contamination of DDT and PCBs in the sediments of the Santa Monica Bay has led to a 303(d) listing of Fish Consumption Advisory. The Santa Monica Bay TMDL for DDTs and PCBs issued in 2012 addresses the impairment to human health consumption due to DDT and PCBs in the Santa Monica Bay from Point Dume to Point Vicente and the Palos Verde Shelf from Point Vicente to Point Fermin.

As part of the adaptive management process, categorization of future WBPCs may be adjusted based on data obtained from monitoring, source evaluations, and BMP implementation. Data collected as part of the approved CIMP may result in future Category 3 designations in instances when receiving water limits are exceeded and MS4 discharges are identified as contributing to such exceedances. Under these conditions, the appropriate agencies will adhere to Section VI.C.2.a.iii of the Permit.

2.2.1 Category 1 – Highest Priority

WBPCs under Category 1 (highest priority) are defined in the Permit as *"water body-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R [of the Permit]."*

The WBPC of bacteria (wet and dry weather) at the Santa Monica Bay Beaches within the SMB JG7 WMP area (including Royal Palms Beach, White Point Beach, and Point Fermin Park Beach) fall within Category 1 because they are listed in the Santa Monica Bay Beaches Bacteria TMDL. The Implementation Plan for compliance with the Wet Weather Santa Monica Bay Beaches Bacteria TMDL for the larger JG7 documents historical monitoring at eight sampling locations between 1997 and 2000 for indicator bacteria. Based on the historical monitoring having fewer exceedances than the reference beach, the Implementation Plan concluded that *"as JG7 already meets the baseline goals and only needs to implement provisions to prevent "backsliding"; the non-integrated approach will be selected. No milestones are proposed, as existing conditions are the equivalent of compliance with the TMDL"* (Regional Board, 2012). As a result, the Implementation Plan states that JG7 should continue to implement BMPs, review the LA County Sanitation Districts' data, and perform investigations as necessary. Tables M-1 and M-2 of Attachment M to the MS4 Permit also show that the compliance monitoring locations within the SMB JG7 WMP geographical area, SMB 7-6, SMB 7-8, and SMB 7-9 are subject to antidegradation conditions because the beaches have fewer exceedance days than the reference beach. Therefore, there is a zero required load reduction for bacteria, and reasonable assurance is demonstrated.

A Debris TMDL exists for Santa Monica Bay. Section VI.E.5.b(i) of the Permit states, *"Pursuant to California Water Code section 13360(a), Permittees may comply with the trash [debris] effluent limitations using any lawful means. Such compliance options are broadly classified as full capture, partial capture, institutional controls, or minimum frequency of assessment and collection… and any combination of these may be employed to achieve compliance."* While trash will not be modeled as part of the RAA, the RAA will address how the JG7 agencies will comply with the TMDL WQBELs by providing details on the planned implementation of the methods listed above, primarily through their Trash Monitoring and Reporting Program.

Although a USEPA TMDL exists for DDTs and PCBs for Santa Monica Bay, the TMDL relies on a limited dataset outside of the JG7 watershed area to establish stormwater load allocations. The TMDL mass-based waste load allocations for DDTs and PCBs are equivalent to the estimated existing stormwater loads (i.e., based on data used in the TMDL, zero MS4 load reduction is required). As a result, it is anticipated that for the WMP RAA, no reductions in DDT and PCB loading from the JG7 MS4s are required to meet the TMDL WQBELs. And while DDTs and PCBs cannot be modeled as a stormwater pollutant for the RAA (due to the lack of land use event mean concentrations and BMP performance data), it will be qualitatively evaluated. It is also noted that the implementation of future institutional and/or structural BMPs throughout the SMB JG7 WMP area will lead to a reduction in runoff volume and suspended sediment loading from the MS4s, thereby further reducing the existing mass load of any sediment-bound DDTs and/or PCBs to the Santa Monica Bay. For these reasons, while DDT and PCBs will be included as Category 1 pollutants, they will be prioritized lower than bacteria and debris within Category 1, and will continue to be evaluated further through the CIMP monitoring effort.

2.2.2 Category 2 – High Priority

Category 2 (high priority) WBPCs are defined as "pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment."

Sediment toxicity is not included as a Category 2 WBPC in Santa Monica Bay to be consistent with USEPA determinations (USEPA, 2012). This USEPA determination was based on lack of toxicity in regional surveys. The Santa Monica Bay PCB and DDT TMDL cites studies from 1986 to 2008, which report findings of low toxicity in the Santa Monica Bay. For example, in 2008 four samples in Santa Monica Bay showed no toxicity and one sample from the Palos Verdes Shelf near Point Fermin showed a low level of toxicity. This low level toxicity threshold used in the 2008 survey is more conservative than required for the listing policy.

Therefore, there are no WBPCs within the SMB JG7 WMP area that currently qualify as Category 2.

2.2.3 Category 3 – Medium Priority

Category 3 (medium priority) designations are to be applied to WBPCs that are not 303(d)-listed but which exceed applicable receiving water limitations contained in the Permit and for which MS4 discharges may be causing or contributing to the exceedance.

There are no WBPCs within the SMB JG7 WMP area that currently qualify as Category 3 that are not already listed as Category 1.

2.3 Source Assessment

The following data sources have been reviewed as part of the source assessment for bacteria and DDT/PCBs in the Santa Monica Bay subwatersheds:

- Findings from the Permittees' Illicit Connections and Illicit Discharge (IC/ID) Elimination Programs;
- Findings from the Permittees' Industrial/Commercial Facilities Programs;
- Findings from the Permittees' Development Construction Programs;
- Findings from the Permittees' Public Agency Activities Programs;
- TMDL source investigations;
- Watershed model results;
- Findings from the Permittees' monitoring programs, including but not limited to TMDL compliance monitoring and receiving water monitoring; and
- Any other pertinent data, information, or studies related to pollutant sources and conditions that that contribute to the highest water quality priorities.

Since the only receiving water in the SMB JG7 WMP area is the Santa Monica Bay, the following source assessment is broken down by pollutant.

2.3.1 Indicator Bacteria

Wet weather runoff event mean concentrations (EMCs) for fecal coliform, based on the Southern California Coastal Water Research Project (SCCWRP) land use data for the Los Angeles region (Stein *et al*, 2007), indicate that the highest concentrations are expected from agricultural land uses (there are none in the SMB JG7 WMP area), followed by commercial and educational, single family residential, multi-family residential, open space, industrial, and transportation. Commercial and educational land uses account for 2% and 3%, respectively, of all land uses in the J7 WMP area, with single family residential (53%), multi-family residential (14%), and open space (27%). Local activites likely account for the sources of bacteria.

The Santa Monica Bay Beaches Bacteria TMDL for both dry and wet weather was the first bacteria TMDL adopted by the Regional Board in the State of California. The Santa Monica Bay Beaches Bacteria TMDL was recently opened for reconsideration, although the source assessment was not part of this update. As a result, the general findings from the original source assessment remain unchanged. These findings are summarized in the 2012 Basin Plan Amendment for the reopened Santa Monica Bay Beaches Bacteria TMDL (Attachment A to Resolution No. R12-007):

> *"With the exception of isolated sewage spills, dry weather urban runoff and stormwater runoff conveyed by storm drains and creeks is the primary source of elevated bacterial indicator densities to beaches. Limited natural runoff and groundwater may also potentially contribute to elevated bacterial indicator densities during winter dry weather"* (Regional Board, 2012).

The Santa Monica Bay Beaches Bacteria TMDL source assessment maintains that dry weather urban runoff and stormwater runoff is the primary source of elevated bacteria concentrations at Santa Monica Bay beaches. Although definitive information regarding the specific sources of bacteria within the watershed is not presented, speculation provided in the dry weather staff report provides some insight into possible sources:

> *"Urban runoff from the storm drain system may have elevated levels of bacterial indicators due to sanitary sewer leaks and spills, illicit connections of sanitary lines to the storm drain system, runoff from homeless encampments, illegal discharges from recreational vehicle holding tanks, and malfunctioning septic tanks among other things. Swimmers can also be a direct source of bacteria to recreational waters. The bacteria indicators used to assess water quality are not specific to human sewage; therefore, fecal matter from animals and birds can also be a source of elevated levels of bacteria, and vegetation and food waste can be a source of elevated levels of total coliform bacteria, specifically"* (Regional Board, 2002).

The 2010-2011 and 2011-2012 Los Angeles County Municipal Stormwater Permit Individual Reports[3] for the JG7 agencies report that both sanitary sewer overflows and IC/ID, while eliminated shortly after being reported, do sometimes occur in their jurisdiction (but not necessarily within the SMB JG7 WMP area).

Additionally, information on non-MS4 sources of surfzone bacteria were compiled and based on a comprehensive review of Southern California published literature, as part of comments on the reopened Bacteria TMDL (City of Malibu, 2012):

> *"A number of recent Santa Monica Bay studies have further identified and confirmed natural (non-anthropogenic) sources of fecal indicator bacteria (FIB) including plants, algae, decaying organic matter, beach wrack and bird feces – implicating these as potentially significant contributors to exceedances (Imamura et al, 2011; Izbicki et al, 2012). Beach sands, sediments and beach wrack have been shown to be capable of serving as reservoirs of FIB, possibly by providing shelter from ultra violet (UV) inactivation and predation by allowing for regrowth (Imamura et al, 2011;, Izbicki et al, 2012; Lee et al, 2006; Ferguson et al, 2005; Grant et al, 2001; Griffith, 2012; Litton et al, 2010; Phillips et al, 2011; Jiang et al, 2004; Sabino et al, 2011; and Weston Solutions, 2010). In fact, enterococci include non-fecal or "natural" strains that live and grow in water, soil, plants and insects (Griffith, 2012). Thus, elevated levels of enterococci in water could be related to input from natural sources. The phenomenon of regrowth of FIB from either anthropogenic or natural sources has been suggested by several studies as a possible source of beach bacteria exceedances (Griffith, 2012; Litton et al, 2010; Weston Solutions, 2010; Izbicki et al, 2012; Weisberg et al, 2009)."*

Other sources of bacteria during wet weather may include other non-MS4 permitted stormwater discharges such as Industrial General Permit sites, Construction General Permit sites, Phase II MS4 Sites (e.g., college campuses), State/Federal owned lands, non-MS4 open space areas such as wildlife habitat, and the California Department of Transportation (Caltrans).

A dry weather characterization study was conducted in 2002 to provide information for the management of dry weather urban flows to assist in further protecting coastal areas. The study characterized urban runoff water quality and quantity, investigated sources of flow, located previously unidentified drains, and assessed potential mitigation measures including feasibility of dry weather diversion of storm drains to the sewage system. Two of the studied outfalls were located in the JG7 WMP geographic area (SMB 7-6 and SMB 7-7). Observed dry weather flow estimates at these sites are summarized in **Table 2-8**. This study concluded that dry weather discharge did not necessarily lead to exceedances of receiving water objectives due to low flows. Additionally, the conclusion was made that the J7 outfalls are not good candidates for diversions due to low flows (County Sanitation District of Los Angeles, 2002).

[3] The available Annual Reports were reviewed for 2010-2011 and 2011-2012.

Table 2-8
Dry Weather Flow Observations

Location	Date	Flow Estimate
SMB 7-6* (LA030)	06/13/2002	No Flow
SMB 7-6* (LA030)	08/09/2002	Trace
SMB 7-6* (LA030)	10/01/2002	No Flow
SMB 7-7 (LA010)	05/02/2002	Trace
SMB 7-7 (LA010)	05/13/2002	<0.001 cfs

*Observation was made upstream of 7-6

On March 4, 2008, Jurisdictional Group 7 received notices of violation and corresponding orders from the LARWQCB pertaining to the LA MS4 waste discharge requirements. Water sample data from the summer dry weather periods of September 14, 2006 to October 31, 2006 and April 1, 2007 to October 31, 2007 reported exceedances of Enterococcus bacteria levels at monitoring location SMP 7-7. There were 9 alleged instances of violations cited in the notices, four of which were single sample exceedances and five were geometric mean exceedances. A source investigation was conducted to determine the cause of the single sample bacteria exceedances. A site survey conducted on March 14, 2008 revealed potential sources at the discharge point to be episodic human activity, homes along the shoreline, domestic animals, natural occurrences including bird and mammals, sewer system overflow, feral cats, compost pile, and septic systems (Santa Monica Bay Beaches Bacterial TMDL Jurisdiction Group 7, 2008).

2.3.2 DDT and PCBs

As stated previously, limited data are available to characterize sources of DDT and PCBs within Santa Monica Bay, particularly since direct discharges of these pollutants from publically-owned treatment works (POTWs) have ceased. The largest concentration of DDT and PCBs within Santa Monica Bay is contained within the Palos Verdes shelf, which is being addressed by the USEPA as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site. Loadings from the shelf to the Bay are large and have been well characterized (USEPA, 2012).

With respect to stormwater, the TMDL does not specifically characterize MS4 loadings, though it does recognize that "DDT and PCBs are no longer detected in routine stormwater sampling from Ballona Creek or Malibu Creek." However, the TMDL also states that current detection limits used to analyze DDT and PCB concentrations are too high to appropriately assess the water quality.

No other data or source information is available at this time. Once three years of water quality data are collected as part of the CIMP and evaluated consistent with the recommendations by USEPA in the TMDL to utilize a three-year averaging period[4], then further source assessment will be considered and the categorization and prioritization of PCB and DDTs as MS4-related pollutants of concern will be reevaluated.

[4] The three-year averaging period is recommended by the USEPA TMDL in Section 8.2, which reads, *"We recommend that stormwater waste load allocations be evaluated based on a three year averaging period"* (USEPA, 2012). Additionally, Permit Attachment M states that compliance with the PCB and DDT waste load allocations shall be determined based on a three-year averaging period.

3 Watershed Control Measures

The Permit specifies that control measures, also referred to as BMPs, shall be identified to ensure that stormwater discharges meet RWLs and WQBELs as established in the Permit and to reduce overall impacts to receiving waters from stormwater and non-stormwater runoff.

BMPs are typically grouped into two broad categories, structural and institutional. Structural BMPs are physically-constructed control measures that alter the hydrology or water quality of stormwater or non-stormwater within the MS4 and are designated as either centralized or distributed based on their location within a watershed and size of contributing drainage area. Institutional BMPs are source control measures that prevent the release of flow/pollutants or transport of pollutants within the MS4 area, but do not involve construction of physical facilities. Minimum control measures (MCMs) are a subset of institutional BMPs.

Due to the zero required load reductions and the SMB JG7 WMP geography (outfalls are located on unstable cliffs and there are landslide and liquefaction hazards throughout the SMB JG7 WMP area), there are currently no centralized or distributed BMPs other than trash exclusion devices planned in the SMB JG7 WMP area at this time. In the event that CIMP monitoring demonstrates a need for quantitative RAA modeling and BMP implementation, BMPs may be selected based on performance data, subsurface conditions, land uses within the contributing drainage areas, and other relevant characteristics.

3.1 Minimum Control Measures/Institutional BMPs

The Permit requires the implementation of MCMs in Parts VI.D.4 through VI.D.10. These MCMs are similar to the programs required under the previous MS4 Permit (Order No. 01-182).

Although the previous MS4 Permit required implementation of MCMs, some of the key modifications introduced by the current MS4 Permit related to MCMs include:

- The Permit calls for more outreach and education as part of the Public Information and Participation Program (PIPP). Permittees, for example, will be required to maintain a website with stormwater-related educational materials.
- Permittees are expected to record additional information on industrial and commercial facilities within their jurisdiction as part of their Industrial/Commercial Facilities Program. For example, industrial/commercial facilities records will need to list receiving waters for which each respective facility is tributary to.
- The Permit provides more detailed criteria on BMP sizing and specification for use in the Permittees' Planning and Land Development Program, formerly the Development Planning Program, and calls for cumulative annual reporting of implemented mitigation projects.
- An Erosion and Sediment Control Plan (ESCP), which includes elements of a Storm Water Pollution Prevention Plan (SWPPP), replaces the Local SWPPP (L-SWPPP) as a required document for construction activities meeting certain criteria as a prerequisite to building/grading permit issuance.
- The Permit also requires Permittees to use an electronic tracking system to track construction activities within their jurisdiction and mandates more frequent inspection schedules.
- The Public Agency Activities Program includes new requirements such as: implementing an integrated pest management program and tracking pesticide inventory, training of field staff including contracted staff in illicit discharge identification and reporting, creating an inventory of

public facilities with the potential to cause stormwater pollution, and to maintain an inventory of pollutant sources at these facilities.

A comprehensive comparison between program requirements of the previous and current MS4 Permits is summarized in **Table 3-1**. Permittee activities under the Storm Water Management Program are summarized in the Los Angeles County Unified Annual Stormwater Reports; the report for the most recent reporting year is available at http://ladpw.org/wmd/npdesrsa/annualreport/index.cfm (Los Angeles County Department of Public Works, 2012).

As required by the Permit, the agencies in the SMB JG7 WMP group are continuing to implement the MCMs required under the 2001 MS4 Permit until the WMP is approved by the Regional Board. Applicable new MCMs will be implemented by the time the WMP is approved by the Regional Board. A brief description of each Program MCM and the tasks associated with each are summarized next. The implementation summaries of the Program MCM tasks identified are available in the Unified Annual Stormwater Report published by the Los Angeles County Department of Public Works. Documentation that the City and LACFCD hold legal authority to implement the MCMs required under the 2001 MS4 Permit can be found in Attachment B.

The agencies in the SMB JG7 WMP group have also developed mechanisms for tracking information related to new development/re-development projects that are subject to post-construction BMP requirements in Part VI.D.7 of the MS4 Permit.

Table 3-1
Comparison of Stormwater Management Program MCMs

Program Element	Activity	Previous Permit (Order No. 01-182)	Current Permit (Order No. R4-2012-0175)
Public Information and Participation Program	Public Education Program - advisory committee meeting (once per year)	X	
	"No Dumping" message on storm drain inlets (by 2/2/2004)	X	
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	X	X
	Outreach and education	X	X
	Make reporting info available to public	X	X
	Public service announcements, advertising, and media relations	X	X
	Public education materials - proper handling	X	X
	Public education materials - activity specific	X	X
	Educational activities and countywide events	X	X
	Quarterly public outreach strategy meetings (by 5/1/2002)	X	
	Constituent-specific outreach information made available to public	X	X
	Business Assistance Program	X	
	Educate and inform corporate managers about stormwater regulations	X	
	Maintain storm water websites		X
	Provide education materials to schools (50 percent of all K-12 children every two years)	X	X
	Provide principle permittee with contact information for staff responsible for storm water public educational activities (by 4/1/2002)	X	X
	Principal permittee shall develop a strategy to measure the effectiveness of in-school education programs	X	
	Principle permittee shall develop a behavioral change assessment strategy (by 5/1/2002)	X	
	Educate and involve ethnic communities and businesses (by 2/3/2003)	X	X
	Reporting hotline for the public (e.g., 888-CLEAN-LA)	X	X
Industrial/Commercial Facilities Program Industrial/Commercial Facilities Program	Track critical sources – Restaurants	X	X
	Track critical sources - Automotive service facilities	X	X
	Track critical sources – RGOs	X	X
	Track critical sources - Nurseries and nursery centers		X
	Track critical sources – USEPA Phase I facilities	X	X
	Track critical sources - Other federally-mandated facilities [40 Code of Federal Regulations (CFR) 122.26(d)(2)(iv)(C)]	X	X
	Track critical sources - Other commercial/industrial facilities that Permittee determines may contribute substantial constituent load to MS4		X
	Facility information - Name of facility	X	X
	Facility information - Contact information of owner/operator	Name only	X
	Facility information - Address	X	X
	Facility information – North American Industry Classification System (NAICS) code		X
	Facility information – Standard Industrial Classification (SIC) code	X	X
	Facility information - Narrative description of the activities performed and/or principal products produced	X	X
	Facility information - Status of exposure of materials to storm water		X
	Facility information - Name of receiving water		X
	Facility information - ID whether tributary to 303(d) listed water and generates constituents for which water is impaired		X
	Facility information - NPDES/general industrial permit status	X	X
	Facility information - No Exposure Certification status		X
	Update inventory of critical sources annually	X	X
	Business Assistance Program	Optional	X
	Notify inventoried industrial/commercial sites on BMP requirement		Once in 5 years
	Inspect critical commercial sources (restaurants, automotive service facilities, retail gasoline outlets and automotive dealerships)	Twice in 5 years	Twice in 5 years
	Inspect critical industrial sources (phase 1 facilities and federally-mandated facilities)	Twice in 5 years[1]	Twice in 5 years[2]
	Verify No Exposure Certifications of applicable facilities		X
	Verify Waste Discharge Identification (WDID) Number of applicable facilities	X	X
	Source control BMPs	X	X
	Provisions for Significant Ecological Areas (SEAs) (Environmentally Sensitive Areas (ESAs)	X[3]	X
	Progressive enforcement of compliance with stormwater requirements	X	X
	Interagency coordination	X	X
Planning and Land Development Program	Peak flow control (post-development stormwater runoff rates, velocities, and duration)	X	X[4]
	Hydromodification Control Plan	In lieu of countywide peak flow control	X
	SUSMP (by 3/3/03)	X	
	Volumetric treatment control (SWQDv) BMPs	X	X
	Flow-based treatment control BMPs	X	X
	Require implementation of post-construction Planning Priority Projects as treatment controls to mitigate storm water pollution (by 3/10/2003)	X	X
	Require verification of maintenance provisions for BMPs	X	X
	California Environmental Quality Act process update to include consideration of potential stormwater quality impacts	X	
	General Plan update to include stormwater quality and quantity management considerations and policies	X	
	Targeted employee training of development planning employees	X	
	Bioretention and biofiltration systems		X
	SUSMP guidance document	X	
	Annual reporting of mitigation project descriptions		X
Development Construction Program	Erosion control BMPs	X	X
	Sediment control BMPs	X	X
	Non-storm water containment on project site	X	X
	Waste containment on project site	X	X
	Require preparation of a Local SWPPP for approval of permitted sites	X	X
	Inspect construction sites on as-needed basis		X
	Inspect construction sites equal to or greater than one acre	Once during wet	Once every two

Program Element	Activity	Previous Permit (Order No. 01-182)	Current Permit (Order No. R4-2012-0175)
		season	weeks[5], monthly
	Electronic tracking system (database and/or Geographic Information System)		X
	Required documents prior to issuance of building/grading permit	L-SWPPP	ESCP/SWPPP
	Implement technical BMP standards		X
	Progressive enforcement	X	X
	Permittee staff training	X	X
Public Agency Activities Program	Public construction activities management	X	X
	Public facility inventory		X
	Inventory of existing development for retrofitting opportunities		X
	Public facility and activity management	X	X
	Vehicle maintenance, material storage facilities, corporation yard management	X	X
	Landscape, park, and recreational facilities management	X	X
	Storm drain operation and maintenance	X	X
	Streets, roads, and parking facilities maintenance	X	X
	Parking facilities management	X	X
	Emergency procedures	X	X
	Alternative treatment control BMPs feasibility study	X	
	Municipal employee and contractor training		X
	Sewage system maintenance, overflow, and spill prevention	X	X
Illicit Connection/Illicit Discharge (IC/ID) Elimination Program	Implementation program	X	X
	MS4 Tracking (mapping) of permitted connections and illicit connections and discharges	X	X
	Procedures for conducting source investigations for IC/IDs	X	X
	Procedures for eliminating IC/IDs	X	X
	Procedures for public reporting of ID		X
	IC/ID response plan	X	X
	IC/IDs education and training for staff	X	X

[1] Tier 2 facilities may be inspected less frequently if they meet certain criteria
[2] Subject to change based on approved JG7 WMP strategy
[3] For environmentally sensitive areas and impaired waters
[4] Maintain pre-project runoff flow rates via hydrologic control measures
[5] Sites of threat to water quality or discharging to impaired water; frequency dependent on chance of rainfall

3.1.1 Customization of MCMs

In lieu of the requirements of Parts VI.D.4 through VI.D.10 of the Permit, the SMB JG7 WMP Group may customize MCMs within each of the general categories. The motivation for considering customization is made more apparent in the Regional Board's response to a comment that the Permit should establish criteria that will be used to support any customization of MCMs; the Regional Board responded with the following:

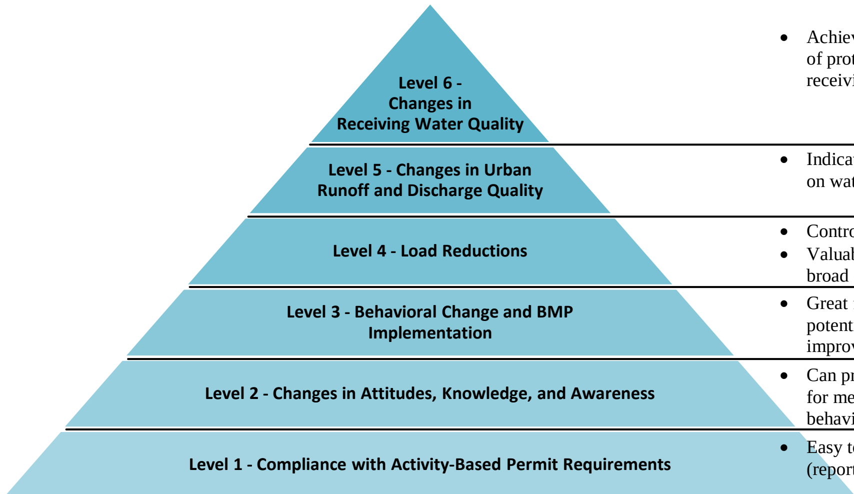
> *The Order specifies that at a minimum, Permittees' programs shall be consistent with 40 CFR section 122.26(d)(2)(iv)(A)-(D). In response to comments that the Order is overly prescriptive, specifying criteria could restrict customization within these categories of minimum control measures. The criterion to allow customization is based on showing equivalent effectiveness, for example, a municipality who has identified a group of facilities within their jurisdiction as the largest source of constituents could be allowed to focus their inspection efforts on controlling the constituents from this subset of facilities.*
> (http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/StormSewer/CommentLetters/E_MCM%20Matrix%2010-26-12%20Final.pdf)

The opportunity for customization may provide benefit by allowing the SMB JG7 WMP Group to assess the effectiveness of their current programs and to modify their programs to better serve local conditions and objectives. If an effectiveness assessment is conducted on a specific MCM activity and it can be reasonably shown that customization of the MCM would result in equal or improved effectiveness on attitudes or knowledge, behavior or implementation, load reduction, or water quality, then a defensible recommendation for modification of that activity can be made, resulting in greater resources available for more effective activities.

The SMB JG7 WMP Group is not planning to customize MCM activities at this time. However, in the event that MCM customization would be beneficial to the identified WBPCs or if CIMP results indicate adjustments would be beneficial and/or needed, the first step in customizing MCM activities would be the development of a framework to assess the effectiveness of each MCM in its current implementation. For each MCM that can be assessed in this manner, recommendations for customizations can be developed with reasonable assurance of impact to effectiveness.

The California Stormwater Quality Association (CASQA) provides such a framework for the effectiveness assessment of Stormwater Management Programs (CASQA, 2006). The outcome is a hierarchy that categorizes the classification of outcome types (levels) that will allow MCMs to be placed into one or more categories for subsequent outcome assessment. The outcome levels, Level 1 through Level 6, are summarized in **Figure 3-1**.

Figure 3-1
General Classification of Outcome types (adapted from CASQA)



Benefits	Limitations
• Achieves ultimate goal of protection of receiving water	• Very difficult to determine for specific MCMs • Sees influence from non-MS4 sources
• Indicates direct impact on water quality	• Requires substantial monitoring
• Controls the source • Valuable for making broad comparisons	• Requires development of a baseline to estimate
• Great first indicator of potential water quality improvement	• Requires observation and inspection
• Can provide the basis for measuring behavioral change	• Many different factors influence levels of public involvement
• Easy to determine (reporting)	Does not indicate direct impacts

3.1.2 MCMs and Outcome Levels

The outcome types in this effectiveness assessment framework are interrelated. The Permit's stormwater management program is, by design, intended to improve the water quality in receiving waters. The means by which this goal is intended to be met is through the implementation of compliance measures by the SMB JG7 WMP Group. Compliance with these activity-based measures results in Level 1 outcomes. Assessments of these activities can provide further understanding of the outcomes they have. Ideally, each activity will contribute to the improvement at the Level 6 receiving water quality level; however, tracking effectiveness at this level is difficult.

A summary of the MCM activities of the agencies within the SMB JG7 WMP Group is included in the 2011-12 Annual Stormwater Report (Los Angeles County Department of Public Works, 2012). In addition to the standard reporting, the agencies answered a list of questions in an Assessment of Program Effectiveness. This summary largely includes responses that may be considered as Level 1 outcomes (compliance) with Level 2, Level 3, and Level 4 outcomes for select MCMs. Several obstacles inhibit the ability to achieve a Level 5 or Level 6 assessment, including:

- Available budget;
- Lack of comprehensive monitoring;
- Timing of MCM activities and corresponding runoff events; and/or
- General complexity of the hydrology and conveyance.

All SMB JG7 WMP Group members were in compliance with the Permit during the 2011-12 reporting year (Level 1 outcome). **Table 3-3** summarizes effectiveness assessment metrics and potential outcomes associated with select MCMs within each Program Element of the Storm Water Management Program. The following is a brief description of the Program MCMs and outcome levels that can be achieved through the effectiveness assessment framework described.

Public Information and Participation Program

The PIPP is intended primarily to reach out and educate the general public, students, business owners, facility operators, city staff, and others on stormwater. This outreach is accomplished in many ways; examples include "No Dumping" messages on storm drain inlets; public education materials; information

websites; community events; reporting hotlines; and specialized awareness programs, such as the used oil program. The program elements are intended to directly impact awareness and the behavior of different target audiences (Level 2 and Level 3 outcomes). Consequently, these behavioral changes may impact constituent loads to the MS4 indirectly, but the actual Level 4 through Level 6 impact of a specific MCM in this category may be difficult to quantify.

Industrial/Commercial Facilities Program

Permittees are required to conduct an Industrial/Commercial Facilities Program designed to prevent illicit discharges, reduce discharges of stormwater, and prevent industrial/commercial discharges to the MS4 from causing or contributing to receiving water quality exceedances. These facilities are tracked and inspected to ensure use of BMPs to control stormwater discharges. In addition, the program aims to contribute to the education of business owners and facility operators regarding SWPPP. The effectiveness of this program can be assessed leading to insight on how awareness (Level 2) and BMP implementation (Level 3) are affected.

Planning and Land Development Program

The Planning and Land Development Program involves developers early in the land development stage, with the integration of BMPs and Low Impact Development (LID) controls to reduce constituent loading to the MS4 and minimize runoff intensity generated from impervious areas. Behavioral change (Level 3) can be assessed through permitting staff observations. Also, it may be possible to assess constituent load reductions (Level 4) through land developer BMP choices and water quality of runoff entering the MS4 (Level 5) if monitoring stations are considered during the planning stage of development and redevelopment.

Development Construction Program

Similar to the Planning and Land Development Program, the Development Construction Program establishes requirements for construction activities to eliminate illicit discharges and prevent water quality violations from stormwater discharges from the construction site. The Program establishes criteria for BMPs and controls through an Erosion and Sediment Control Plan, with elements of a SWPPP. The effectiveness of this program can be assessed through inspections to verify BMP implementation (Level 3). Level 2 awareness outcomes can be assessed through the use of a website that informs contractors on proper BMP selection and prerequisite checklists for permitting.

Public Agency Activities Program

Activities ranging from street sweeping, catch basin cleaning, public facility maintenance, and storm drain operation fall under the Public Agency Activities Program. These activities are essential MCMs that can also be measured for effectiveness. Level 3 through Level 5 outcomes (behavior, load reduction, MS4 water quality) can all be assessed through appropriate evaluation metrics. The impact to receiving water quality (Level 6) may be possible to determine if appropriate monitoring is in place, with phased implementation of MCM activities to isolate performance evaluation.

Illicit Connections and Illicit Discharges Elimination Program

IC/IDs are controlled through the IC/ID Elimination Program and by implementing a procedure for reporting, tracking, and responding to reports of IC/IDs, as well as establishing protocols for the regular inspection of storm drains. The effectiveness of the reporting procedure can be assessed on a Level 2 (awareness) basis, and response activities can have their effectiveness determined directly through monitoring of the MS4 water quality (Level 5). A quantitative analysis of behavioral change (Level 3) as a result of enforcement actions is also achievable.

Catch Basin Retrofit Program

The City of Los Angeles JG7 WMP area contains 218 catch basins, all of which will be retrofitted with catch basin inserts in order to comply with the Santa Monica Bay Nearshore and Offshore Debris TMDL requirements. The catch basin inserts meet the RWQCB definition of full capture device as described in the TMDL and the 5-millimeter perforated inserts can treat a storm flow of a 1-year, 1-hour storm. Catch basin inserts are planned for installation according to the schedule presented in **Table 3-2** (City of Los Angeles, TRMP, 2012). Agencies responsible for the implementation of the catch basin retrofit program include Los Angeles Flood Control District, and the City of Los Angeles. The City of Los Angeles will retrofit all catch basins, including those owned by the LACFCD. In turn, the LACFCD will work with the City of Los Angeles to issue permits for installation of full capture devices on all LACFCD-owned catch basins.

Table 3-2
Catch Basin Retrofit Implementation Schedule

RWQCP Implementation Goal	Date
57 catch basin opening cover and/or insert retrofits (cumulative) (26% of load reduced)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (100% of load reduced)	July 2016

3.1.3 Next Steps to MCM Customization

The assessment framework outlines the process to determine baseline MCM effectiveness, providing the foundation for customization. Pending the results of the approved CIMP, opportunities for modifying MCM activities may be proposed by the SMB JG7 WMP Group as part of the adaptive management process.

It should be noted, however, that institutional BMPs (or MCMs) such as street and median sweeping implementations, drain inlet and conveyance system cleaning, pet waste program enhancements, etc. are expected to continue to cumulatively result in a pollutant load reduction of up to or approximately 5%. Additionally, assuming past data also reflect future trends, it is anticipated that 0.1 – 0.2% of residential, commercial, and industrial properties will implement LID annually through development or redevelopment projects[5]. Although RWLs are currently being met, it is anticipated that implementation of LID will further enhance the water quality in this region.

[5] 0.1% annual estimate is based on a review of development/redevelopment projects within the SMB JG7 WMP Group area over the past 10 years assuming a 0.2 acre lot size. 0.2% annual estimate is based on the area-weighted projected development/redevelopment rate for residential, commercial, and industrial land uses reported by the City in the Ballona TMDL Implementation Plan.

Table 3-3
Effectiveness Assessment Measures for Various Activities under the Storm Water Management Program

Program MCM	Permittee Activity	Possible Assessment Metric	Outcome Level
Public Information and Participation Program	Advertising / media campaigns (e.g., Used Oil / Used Oil Filter Program)	Year-over-year change in no. of impressions	L2
		Survey results	L2, L3
	Educational programs (e.g., Generation Earth, Environmental Defenders, public workshops)	Year-over-year change in attendance	L2
		Quiz results	L2, L3
	E-Waste collection events	Amount of Household Hazardous Waste/E-Waste	L3, L4
	888-CLEAN-LA hotline	Change in no. of calls	L2
	www.888CleanLA.com	No. of unique visitors / document downloads	L2
Industrial/Commercial Facilities Program	Website on program details	No. of unique visitors / document downloads	L2
	Electronic tracking	Inspections: change in no. of Notices of Violation (NOV) / non-compliance	L3
Planning and Land Development Program	Pre-permitting assessment	No. of developers incorporating BMPs and LID in early-stage	L3
	Annual reporting	% of stormwater capture	L3, L4
	Integrated control measures	Measure performance through planned monitoring	L5
Development Construction Program	Website on program details	Number of hits / document downloads	L2
	Electronic tracking	Inspections: change in no. of NOV / non-compliance	L3
Public Agency Activities Program	Street sweeping	Street sweeper fleet (technology)	L3
		Year-over-year change in debris collected	L3, L4
	Catch basin cleaning	Year-over-year change in trash collected	L3, L4
	Installation of trash receptacles	Observations: cleanliness of public roadways	L3
	Sanitary sewer overflow response	Monitoring results of MS4 water quality	L5
IC/ID Elimination Program	IC/ID reporting hotline	Year-over-year change in no. of calls	L2
	Termination of IC/ID	Outfall monitoring: change in water quality	L5
	Enforcement actions	Change in occurrence	L3
Other	Support for Senate Bill (SB) 346 (Brake Pad Initiative)	% of vehicles with reduced-copper-content brake pads	L4

4 Reasonable Assurance Analysis

Typically, an important component of the WMP is the RAA. The RAA is a process that is used to demonstrate that institutional and structural control measures are expected to be sufficient for achieving applicable WQBELs and/or RWLs for the water body pollutant combinations that have compliance deadlines within the Permit term. In addition to using the RAA as a means to determine the efficacy of existing and potential control measures, the RAA also facilitates the selection of BMPs as well as the prioritization of BMP implementation.

For the SMB JG7 WMP, there are currently zero required load reductions for the Category 1 WBPCs: bacteria at the Santa Monica Bay Beaches and PCBs/DDTs in the Santa Monica Bay. Compliance with the Debris TMDL is being demonstrated through retrofitting of catch basins as outlined in the Trash Monitoring and Reporting Program (City of Los Angeles Department of Public Works, 2012). No Category 2 or Category 3 WBPCs have been identified based on currently available monitoring data. Furthermore, it is anticipated that implementation of MCMs and related activities will progressively improve water quality.

Therefore, no quantitative RAA modeling is required for this WMP. For purposes of completeness, however, each Category 1 WBPC is qualitatively discussed below.

4.1 Bacteria

Because the compliance monitoring locations within the SMB JG7 WMP geographical area, SMB 7-6, SMB 7-8, and SMB 7-9 are subject to antidegradation conditions (i.e., the beaches have fewer exceedance days than the reference beach), there is therefore a zero required load reduction for bacteria (because target load reductions are set equal to the load of the reference beach), and reasonable assurance is demonstrated. Additionally, when occasional exceedances were investigated, the cause was often the results of isolated local beach activities, which were ceased upon discovery. As part of the adaptive management process based on monitoring data collected through the approved CIMP, structural and/or nonstructural BMPs may be proposed if needed.

4.2 PCBs and DDTs

The Santa Monica Bay TMDL for DDTs and PCBs developed WLAs for stormwater throughout the Santa Monica Bay watershed. Because the SMB JG7 WMP group area contribution is not distinctly defined in the TMDL, the WLAs assigned to the entire Santa Monica Bay WMA as a whole are being used for this discussion. Table 6-3 in the TMDL lists the existing annual DDT and PCB loads as compared to the annual maximum allowable loads. The existing estimated loads for all of Santa Monica Bay and most of the individual watersheds are estimated to be lower than the maximum allowable loads. As such, the WLAs for the entire Santa Monica Bay WMA were set equal to the existing estimates of annual loads for DDTs and PCBs as 28 grams per year (g/yr) and 145 g/yr, respectively. Therefore, there is a zero required load reduction for PCBs and DDTs, and reasonable assurance is demonstrated.

As part of the adaptive management process based on monitoring data collected through the approved CIMP, additional structural and/or nonstructural BMPs may be proposed if needed. Additionally, if the loads are found to be higher than estimated, but still less than the maximum allowable loads, there may be potential for the WLA to be revised.

4.3 Debris and Plastic Pellets

Compliance with the Debris TMDL will be met through a phased retrofit of all 218 catch basins throughout the JG7 WMP area (182 City owned and 36 County owned) by 2016, ahead of the Regional Board implementation goals for 2020 completion date. Consistent with the City's Trash Monitoring and Reporting Plan (TMRP) (City of Los Angeles Department of Public Works, 2012), *"vertical insert[s] with 5-mm openings and flow activated opening screen covers are the best suited for implementation within the City to achieve compliance with Trash TMDLs"*.

There are no industrial facilities within the SMB JG7 WMP area that use, store, transport, manufacture, or handle plastic pellets. Therefore, the City's Plastic Pellet Monitoring and Reporting Plan (PMRP) will only include an emergency response plan.

5
Adaptive Management Process

The Notice of Intent submitted to the Regional Board in December 2013 provided a schedule of interim milestones for the development of the CIMP and WMP Plan. At this time, the SMB JG7 WMP Group does not anticipate any deviations from the schedule. Completed milestones and projected completion dates for future milestones are presented in **Table 5-1.** The catch basin retrofit schedule, as provided in the TMRP, is also included in the table.

Table 5-1
WMP Schedule of Interim and Final Milestones

Deliverable	Planned Date of Completion
Submit Revised Final Draft WMP to the Regional Board	January 2015
Submit Final Draft CIMP to the Regional Board	June 2014
Submit Revised Final CIMP to the Regional Board	April 2015
57 catch basin opening cover and/or insert retrofits (cumulative) (26%)	December 2015
161 catch basin opening cover and/or insert retrofits (cumulative) (74%)	July 2016

The WMP is intended to be implemented as an adaptive program. As new program elements are implemented and information is gathered over time, the WMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP will employ an adaptive management process that will allow the WMP to evolve over time.

5.1 Compliance Schedule

The compliance deadlines in the Santa Monica Bay Beaches Bacteria TMDL are currently in effect for SMB 7-6, SMB 7-8, and SMB 7-9. A new SMB 7-7 will be identified to replace the previous site that was destroyed by a landslide, this location will be identified in the revised CIMP. The EPA TMDL for PCBs and DDTs does not include a compliance schedule for the WLAs for the Santa Monica Bay WMA. However, to demonstrate compliance with the TMDL, DDTs and PCBs will be assessed by monitoring the sediment fraction at the J7 MS4 outfall monitoring point using a three year averaging period, with the first compliance assessment three years after CIMP implementation.

Part VI.C.8 of the Permit details the adaptive management process to be included in the WMP that includes the following requirements:

i. Permittees shall adapt the WMP to become more effective every two years from the date of program approval based on, but not limited to, a consideration of:

   (1) Progress toward achieving WQBELs and/or RWLs;

   (2) Permittee monitoring data;

   (3) Achievement of interim milestones;

   (4) Re-evaluation of water quality priorities and source assessment;

(5) Non-Permittee monitoring data;

(6) Regional Board recommendations; and

(7) Recommendations through a public participation process.

ii. Permittees shall report any modifications to the WMP in the annual report.

iii. Permittees shall implement any modifications to the WMP upon approval by the Regional Board or within 60 days of submittal if the Regional Board expresses no objections.

The adaptations to the WMP as called for in the adaptive management process essentially include a re-evaluation of water quality priorities, an updated source assessment, an effectiveness assessment of watershed control measures, and a RAA. The CIMP will gather additional data on receiving water conditions and stormwater/non-stormwater quality to inform these analyses. This process will be repeated every two years as part of the adaptive management process.

5.2 Re-Characterization of Water Quality Priorities

Water quality within the SMB JG7 WMP Group will be re-characterized using data collected as part of the approved CIMP. WBPCs may be updated as a result of changing water quality. Category 3 WBPCs will be identified based on data collected as part of the approved CIMP. These classifications will be important for refocusing improvement efforts and informing the selection of future watershed control measures.

Demonstration that MS4 discharges have caused or contributed to the exceedance of receiving water limitations will be made if the following criterion has been met:

- Simultaneously collected water samples, as consistent with the CIMP, exceed the receiving water limitations as sampled in the receiving water and exceed the WQBELs, action levels as defined in Appendix G, or receiving water limits, in that order, at the MS4 outfall.
-

5.3 Source Assessment Re-evaluation

The assessment of possible sources of water quality constituents will be re-evaluated based on new information from stormwater outfall monitoring, receiving water monitoring, and from Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) which are part of the CIMP implementation efforts

The SMB J7 Revised CIMP (2015) maintains that the Non-Stormwater Program provides an assessment of whether significant non-stormwater discharges are potentially impacting the receiving water and determines whether significant non-stormwater discharges are allowable. To this end, all major outfalls will be screened prior to dry-weather monitoring through an outfall monitoring and screening program. The outfall screening program will include updating outfall inventory, measuring observed flows, and testing for E.coli where flows are observed. If an outfall exhibits significant non-stormwater discharges, the SMB JG7 WMP Group will complete source identification activities. The information collected through monitoring and source identification efforts will be used to determine if the site is attributed to illicit discharges (City of Los Angeles, 2014).

An initial field survey was conducted for the identification of outfalls in the JG7 WMP Group area on April 15, 2014[6]. The SMB JG7 Group will perform three outfall screenings in the first year after CIMP approval. If any outfalls are identified as producing significant non-stormwater discharges, based on flow and bacteria sampling, a source identification investigation will be conducted to identify potential sources of non-stormwater discharge which may include taking field measurements to characterize the discharge, following dry-weather flows upstream, or compiling and reviewing available resources such as past monitoring data or aerial photography.

If the source is determined to be an illicit discharge, then the Permittee must implement procedures to eliminate the discharge consistent with IC/ID requirements and document actions. If the source is authorized, conditionally exempt, or originating from natural flows, then the source will be documented per CIMP requirements. If the source is unknown, then the Permittee must conduct monitoring consistent with Part IX.G of the Monitoring and Report Program MRP. Finally, for sources originating upstream of the SMB JG7 WMP Group, the Permittee must inform the upstream WMA and Regional Board within 30 days.

The identification of non-MS4 and MS4 pollutant sources is an essential component of the WMP because it determines whether the source can be controlled by watershed control measures. As further monitoring is conducted and potential sources are better understood, the assessment becomes more accurate and informed.

5.4 Effectiveness Assessment of Watershed Control Measures

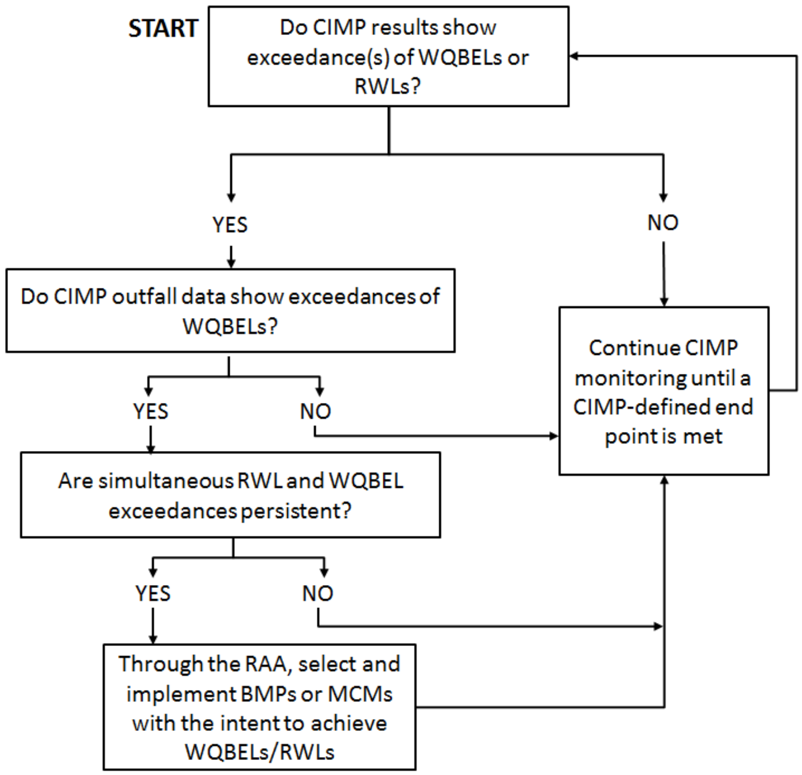
The evaluation of BMP effectiveness is an important part of the adaptive management process and the overall WMP. Implementation of the CIMP can provide a quantitative assessment of structural BMP effectiveness, if BMPs are implemented in the future, as it relates to actual pollutant load reduction to determine how selected BMPs have performed at addressing established water quality priorities. In addition, the adaptive management process is a required step for the customization of MCMs as detailed previously. Effectiveness assessment becomes important for the selection of future control measures to be considered.

5.5 Update of Reasonable Assurance Analysis

The RAA is an iterative process that depends on the continuous refinement and calibration of the watershed models when used. Data gathered as a result of the CIMP will support adaptive management at multiple levels, including (1) generating data not previously available to support model updates (if through the course of the CIMP, modeling becomes necessary in the SMB JG7 WMP), and (2) tracking improvements in water quality over the course of WMP implementation. This process is illustrated in **Figure 5-1**.

[6] The survey conducted in 2014 was based on the SMB JG7 WMP boundary as defined by the Regional Board's EWMP shapefile provided on their website. However, this boudary has since been revised to include the Point Fermin area and will be updated in the Revised CIMP.

Figure 5-1
Adaptive Management Process



6 References

CASQA, 2006. “An Introduction to Stormwater Program Effectiveness Assessment.” White Paper: http://www.scvurpppw2k.com/pdfs/0405/CASQA%20White%20Paper_An%20Introduction%20to%20Stormwater%20Program%20Effectiveness%20Assessment4.pdf.

City of Los Angeles and LACFCD, 2014. Coordinated Integrated Monitoring Plan (CIMP) for the City of Los Angeles Area in Jurisdictional Group 7 of the Santa Monica Bay Watershed. June.

City of Los Angeles Department of Public Works, 2012. Trash Monitoring and Reporting Plan: Santa Monica Bay Nearshore and Offshore Debris TMDL. September 19.

City of Malibu, 2012. Comment Letter – Bacteria TMDL Revisions for Santa Monica Bay Beaches. May 7, 2012.

County Sanitation District of Los Angeles, 2002. Dry Weather Characterization Study. Supplemental Environmental Project No. 1 (SEP No. 1) Final Report. December 30.

Curren, J., S. Bush, S. Ha, M.K. Stenstrom, S. Lau, I.H. Suffet, 2011. Identification of subwatershed sources for chlorinated pesticides and polychlorinated biphenyls in the Ballona Creek watershed. Science of the Total Environment 409: 2525-2533.

Ferguson, D.M., Moore, D.F., Getrich, M.A., and M.H. Zhowandai, 2005. “Enumeration and speciation of enterococci found in marine and intertidal sediments and coastal water in southern California.” Journal of Applied Microbiology 99(3).

Grant, S.B., Sanders, B.F., Boehm, A.B., Redman, J.A., Kim, J.H., Mrse, R.D., Chu, A.K., Gouldin, M., McGee, C.D., Gardiner, N.A., Jones, B.H., Svejkovsky, J., Leipzig, G.V., and A. Brown, 2001. “Generation of Enterococci Bacteria in a Coastal Saltwater Marsh and its Impact on Surf Zone Water Quality.” Environmental Science and Technology 35(12).

Griffith, J.F., 2012. “San Diego County Enterococcus Regrowth Study.” SCCWRP Technical Report.

Imamura, G.J., Thompson, R.S., Boehm, A.B., and J.A. Jay, 2011. “Wrack promotes the persistence of fecal indicator bacteria in marine sands and seawater.” FEMS Microbiology Ecology 77(1).

Izbicki, J., Swarzenski, P., Burton, C., and L.C. Van DeWerfhorst, 2012. “Sources of fecal indicator bacteria to groundwater, Malibu Lagoon, and the near-shore ocean, Malibu, California.” Submitted 2012.

Jiang, S., McGee, C., Candelaria, L., and G. Brown, 2004. “Swimmer Shedding Study in Newport Dunes, California. Final Report.” http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/tmdl/docs/swimmerreport.pdf

Lee, C.M., Lin, T.Y., Lin, C.C., Kohbodi, G.A., Bhatt, A., Lee, R., and J.A. Jay, 2006. “Persistence of fecal indicator bacteria in Santa Monica Bay beach sediments.” Water Research 40(14).

Litton, R.M., Ahn, J.H., Sercu, B., Holden, P.A., Sedlak, D.L., and S.B. Grant, 2010. “Evaluation of Chemical, Molecular, and Traditional Markers of Fecal Contamination in an Effluent Dominated Urban Stream.” Environmental Science and Technology 44(19).

Los Angeles Regional Water Quality Control Board (Regional Board), 2012. Order No. R4-2012-0175 NPDES Permit No. CAS004001 Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, except those Discharges Originating from the City of Long Beach MS4. November 8.

http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/la_ms4/2012/Order%20R4-2012-0175%20-%20A%20Final%20Order%20revised.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2012. Regional Board Basin Plan Amendment for the Santa Monica Bay Beaches Bacteria TMDL. June 7, 2012. http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/90_New/Jan2013/Final%20BPA%20Attach%20A%20SMBB%20Dry&Wet%2007Jun12.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2010. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region for the Santa Monica Bay Nearshore and Offshore Debris TMDL. Attachment A to Resolution No. R10-010. Adopted November 4, 2010. http://63.199.216.6/larwqcb_new/bpa/docs/R10-010/R10-010_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Draft Santa Monica Bay Beaches Bacteria TMDL, Revised Staff Report (Dry Weather Only). January 14, 2002. http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/2002-004/02_0114_tmdl%20Dry%20Weather%20Only_web.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 02-004. http://63.199.216.6/larwqcb_new/bpa/docs/2002-004/2002-004_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 2002. Proposed Amendments to the Water Quality Control Plan – Los Angeles Region to incorporate Implementation Provisions for the Region's Bacteria Objectives and to incorporate the Santa Monica Bay Beaches Bacteria TMDL. Attachment A to Resolution No. 2002-022. http://63.199.216.6/larwqcb_new/bpa/docs/2002-022/2002-022_RB_BPA.pdf

Los Angeles Regional Water Quality Control Board (Regional Board), 1995. Updated 2011. Water Quality Control Plan, Los Angeles Region. http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/index.shtml

Phillips, M.C., Solo-Gabriele, H.M., Piggot, A.M., Klaus, J.S., and Y. Zhang, 2011. "Relationships between Sand and Water Quality at Recreational Beaches", Water Resources 45(20).

Sabino, R., Verissimo, C., Cunha, M.A., Wergikowski, B., Ferreira, F.C., Rodrigues, R., Parada, H., Falcao, L., Rosado, L., Pinheiro, C., Paixao, E., and J. Brandao, 2011. "Pathogenic fungi: An unacknowledged risk at coastal resorts? New insights on microbiological sand quality in Portugal." Marine Pollution Bulletin 62: 1506-1511.

Santa Monica Bay Beaches Bacterial TMDL Jurisdiction Group 7, 2008. "Santa Monica Bay Beaches Bacterial TMDL Jurisdiction 7 Investigation Report". May 21.

State Water Resources Control Board, 2004. "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List". September. http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf

Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. "Sources, Patterns and Mechanisms of Storm Water Pollutant Loading From Watersheds and Land Uses of the Greater Los Angeles Area, California, USA." Southern California Research Project (SCCWRP), Technical Report 510, March.

United States Environmental Protection Agency (USEPA), 2012. Santa Monica Bay Total Maximum Daily Loads for DDTs and PCBs.

Weisberg, S.B., and D.M. Ferguson, 2009. "North Santa Monica Bay Source Investigation Study, Ramirez Creek and Escondido Creek, Malibu, 2009 Summary and Recommended Studies." SCCWRP.

References

Weston Solutions, 2010. “Tecolote Creek Microbial Source Tracking Summary – Phases I, II, and III.”

Attachment A

Santa Monica Bay Shoreline Monitoring Data within SMB JG7 WMP Group Area

Table A1 – Average, Median, Minimum, and Maximum of Results for Santa Monica Bay Shoreline Monitoring Data (SMB JG7 WMP Group Area). Years defined as November 1 – October 31.

Analyte	Event Type	Station	Average (MPN/100ml)						Median (MPN/100ml)						Min (MPN/100ml)						Max (MPN/100ml)					
			2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Total Coliform	Dry-Summer	SMB 7-6	83	34.2	43	28	102	95	12	18	31	18	36	59	1	3	3	1	1	4	950	140	240	120	1400	340
Total Coliform	Dry-Winter		21	391	29	131	91	39	8.5	31	16	20	34	18	3	1	1	4	5	8	160	3600	78	570	540	120
Total Coliform	Wet		102	352	244	173	796	94	98	230	73	71	90	66	4	18	4	4	4	12	240	1000	1600	800	8000	310
Fecal Coliform	Dry-Summer		25	9.6	9.3	12	41	14	2.5	3.5	4	5.5	9	6	1	1	1	1	1	1	580	50	56	72	580	110
Fecal Coliform	Dry-Winter		9.9	34	13	101	52	16	2	8.5	3.5	7	16	8	1	1	1	1	1	4	100	250	78	480	470	62
Fecal Coliform	Wet		11	27	21	24	43	35	6.5	32	5	13	11	8	1	5	1	3	1	1	44	40	100	78	260	160
Enterococcus	Dry-Summer		25	12	16	17	17	11	2	3	4	7.5	4	4	1	1	1	1	1	1	360	78	260	90	120	160
Enterococcus	Dry-Winter		11	197	39	158	35	13	4	16	14	7.5	10	4	1	1	1	1	1	1	44	2600	140	1700	190	62
Enterococcus	Wet		119	76	82	99	142	6.8	46	69	24	14	42	6	1	12	1	1	1	3	560	170	270	1000	1200	16
Total Coliform	Dry-Summer	SMB 7-7	31	404	-	24	-	-	8.5	5	-	24	-	-	1	1	-	24	-	-	200	7800	-	24	-	-
Total Coliform	Dry-Winter		49	37	-	-	-	-	16	9	8.5	-	-	-	1	1	1	-	-	-	440	440	16000	-	-	-
Total Coliform	Wet		157	257	-	24	-	-	68	90	24	-	-	-	41	1	-	24	-	-	420	1100	-	24	-	-
Fecal Coliform	Dry-Summer		7.4	159	-	24	-	-	1	1	-	24	-	-	1	1	-	24	-	-	68	4200	-	24	-	-
Fecal Coliform	Dry-Winter		20	8.4	-	-	-	-	1	2	6	-	-	-	1	1	1	-	-	-	230	86	7400	-	-	-
Fecal Coliform	Wet		21	40	-	24	-	-	20	34	24	-	-	-	2	1	-	24	-	-	35	150	-	24	-	-
Enterococcus	Dry-Summer		11	255	-	24	-	-	5	1		24	-	-	1	1	-	24	-	-	88	6200	-	24	-	-
Enterococcus	Dry-Winter		26	29	-	-	-	-	7	5	9	-	-	-	1	1	1	-	-	-	160	260	2200	-	-	-
Enterococcus	Wet		136	209	-	24	-	-	46	74	24	-	-	-	1	7	24	-	-	-	660	740	24	-	-	-
Total Coliform	Dry-Summer	SMB 7-8	53	23	12	47	461	46	9	4	6.5	10	18	12	1	1	1	1	1	1	1200	200	73	200	8800	600
Total Coliform	Dry-Winter		23	60	11	1210	103	98	16	12	8	35	14	27	1	1	1	1	1	1	120	600	36	13000	1000	410
Total Coliform	Wet		73	126	59	230	96	193	55	82	36	116	55	28	1	18	1	1	3	8	200	290	200	1200	200	690
Fecal Coliform	Dry-Summer		4.8	3.1	1.8	5.1	35	6.6	1	1	1	1	4	1	1	1	1	1	1	1	30	27	5	33	660	74
Fecal Coliform	Dry-Winter		6.8	16	1.8	2.4	3.0	2.8	4	1	1	1	2	1	1	1	1	1	1	1	20	170	4	8	8	15
Fecal Coliform	Wet		4.6	17	6.9	25	14	10	5	11	3	4.5	4	3	1	4	1	1	1	1	9	46	36	200	100	50

Analyte	Event Type	Station	Average (MPN/100ml)						Median (MPN/100ml)						Min (MPN/100ml)						Max (MPN/100ml)					
			2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Enterococcus	Dry-Summer		5.0	5.2	2.9	6.7	33	2.0	1	1	1	1	1	1	1	1	1	1	1	1	44	62	19	97	780	19
Enterococcus	Dry-Winter		7.9	38	4.0	21	3.3	2.2	3	4	1	3	1	1	1	1	1	1	1	1	54	540	17	180	13	11
Enterococcus	Wet		23	44	20	117	35	11	9.5	31	8	12	5.5	1.5	1	4	1	1	1	1	70	120	100	1100	280	49
Total Coliform	Dry-Summer	SMB 7-9	49	17	18	24	35	12	12	10	8	16	18	6	1	1	1	1	3	1	480	100	180	130	320	47
Total Coliform	Dry-Winter		28	46	26	252	16	12	18	20	13	31	5	5	1	1	1	1	3	1	130	200	180	1800	85	56
Total Coliform	Wet		142	82	1066	595	105	38	36	38	40	46	19	14	4	20	4	1	16	4	900	220	12000	3400	700	140
Fecal Coliform	Dry-Summer		36	6	7.5	14	18	5.7	7	3.5	4	8	7.5	3	1	1	1	1	1	1	500	26	55	66	200	33
Fecal Coliform	Dry-Winter		26	23	12	85	14	7.2	17	11	3	7	5	4	1	1	1	1	1	1	160	130	100	640	93	40
Fecal Coliform	Wet		43	13	14	61	18	6.4	19	17	5	21	15	4	1	5	1	1	2	1	700	46	180	1500	110	23
Enterococcus	Dry-Summer		7.6	8.1	6.6	36	3.6	3.1	3	3	3	2	2	1	1	1	1	1	1	1	51	60	42	820	21	23
Enterococcus	Dry-Winter		12	35	16.8	48.2	3.7	3.5	5	17	2	5	4	1	1	1	1	1	1	1	44	320	160	400	9	23
Enterococcus	Wet		387	25	112.2	91.2	10.4	5.8	45	12	10	14	7	1	1	5	1	1	1	1	2800	82	1100	820	34	29

Attachment B

Legal Documentation of Authority

COUNTY OF LOS ANGELES
OFFICE OF THE COUNTY COUNSEL
648 KENNETH HAHN HALL OF ADMINISTRATION
500 WEST TEMPLE STREET
LOS ANGELES, CALIFORNIA 90012-2713

JOHN F. KRATTLI
County Counsel

TELEPHONE
(213) 974-1923
FACSIMILE
(213) 687-7337
TDD
(213) 633-0901

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"):

Certification Pursuant To Order Part VI(A)(2)(b)

"*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.

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*"

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

CITY OF LOS ANGELES
CALIFORNIA

BOARD OF PUBLIC WORKS MEMBERS

KEVIN JAMES
PRESIDENT

MONICA RODRIGUEZ
VICE PRESIDENT

MATT SZABO
PRESIDENT PRO TEMPORE

MICHAEL R. DAVIS
COMMISSIONER

BARBARA ROMERO
COMMISSIONER

ERIC GARCETTI
MAYOR

BUREAU OF SANITATION

ENRIQUE C. ZALDIVAR
DIRECTOR

TRACI J. MINAMIDE
CHIEF OPERATING OFFICER

VAROUJ S. ABKIAN
ADEL H. HAGEKHALIL
ALEXANDER E. HELOU
ASSISTANT DIRECTORS

LISA B. MOWERY
CHIEF FINANCIAL OFFICER

1149 SOUTH BROADWAY, 10TH FLOOR
LOS ANGELES, CA 90015
TEL: (213) 485-0587
FAX: (213) 485-3939
WWW.LACITYSAN.ORG

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

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

August 5, 2015

Dr. Shahram Kharaghani
City of Los Angeles
Department of Public Works, Bureau of Sanitation
Watershed Protection Division
1149 South Broadway, 10th Floor
Los Angeles, CA 90015

Ms. Gail Farber, Chief Engineer
Los Angeles County Flood Control District
Department of Public Works
Watershed Management Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803

FINAL APPROVED WATERSHED MANAGEMENT PROGRAM (WMP) FOR THE CITY OF LOS ANGELES AREA IN SANTA MONICA BAY JURISDICTIONAL GROUP 7 SUBWATERSHED, PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT (NPDES PERMIT NO. CAS004001; ORDER NO. R4-2012-0175)

Dear Dr. Kharaghani and Ms. Farber:

On November 8, 2012, the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board) adopted Order No. R4-2012-0175, *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* (hereafter, LA County MS4 Permit). The LA County MS4 Permit allows Permittees the option to develop either a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to implement permit requirements on a watershed scale through customized strategies, control measures, and best management practices (BMPs). Development of a WMP or EWMP is voluntary and allows a Permittee to address the highest watershed priorities, including complying with the requirements of Part V.A (Receiving Water Limitations), Part VI.E and Attachments L through R (Total Maximum Daily Load Provisions), by customizing the control measures in Parts III.A (Prohibitions – Non-Storm Water Discharges) and VI.D (Minimum Control Measures), except the Planning and Land Development Program.

On April 28, 2015, on behalf of the Los Angeles Water Board, I approved, with conditions, the WMP for the City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7 Subwatershed. My approval letter directed the City of Los Angeles and Los Angeles County

Flood Control District (LACFCD) to submit a final WMP that satisfies all the conditions listed in the letter no later than May 28, 2015. On May 28, 2015 the City of Los Angeles and LACFCD submitted a final WMP, as directed.

After review of the final WMP submitted by the City of Los Angeles and LACFCD on May 28, 2015, I have determined that the WMP satisfies all of the conditions identified in my April 28, 2015 approval letter. The WMP dated May 28, 2015 constitutes the final approved WMP for the City of Los Angeles Area in Santa Monica Bay Jurisdictional Group 7 Subwatershed.

The Los Angeles Water Board appreciates the participation and cooperation of the City and LACFCD in the implementation of the LA County MS4 Permit. If you have any questions, please contact Rebecca Christmann at Rebecca.Christmann@waterboards.ca.gov or by phone at (213) 576-5734. Alternatively, you may also contact Ivar Ridgeway, Chief Storm Water Permitting Unit, at Ivar.Ridgeway@waterboards.ca.gov or by phone at (213) 620-2150.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

cc: Donna Chen, City of Los Angeles
Hubertus Cox, City of Los Angeles
Hamid Tadayon, City of Los Angeles
Angela George, Los Angeles County Flood Control District
Paul Alva, Los Angeles County Flood Control District