Section 7
Detailed EWMP Implementation Strategy and Compliance Schedule

The EWMP Implementation Strategy is the "recipe for compliance" for each jurisdiction to address Water Quality Priorities and comply with the provisions of the MS4 Permit. Through the RAA, a series of quantitative analyses were used to identify the capacities of LID, green streets and regional BMPs that comprise the EWMP Implementation Strategy and assure those control measures will address the Water Quality Priorities. The EWMP Implementation Strategy includes individual recipes for compliance for each jurisdiction and each watershed/assessment area – Ballona Creek (mainstem), Sepulveda Channel, and Centinela Creek, (see Figure 6-1 for a map of these assessment areas). Implementation of the EWMP Implementation Strategy will provide a BMP-based compliance pathway for each jurisdiction under the MS4 Permit. This section describes the EWMP Implementation Strategy and the pace of its implementation to achieve program milestones. Subsections include:

- Elements of the EWMP Implementation Strategy (7.1);
- Stormwater control measures to be implemented by 2021 for final compliance (7.2);
- Scheduling of stormwater control measures to achieve TMDL and EWMP milestones (7.3); and
- Non-stormwater control measures (7.4).

7.1 What are the Elements of the EWMP Implementation Strategy?

The EWMP Implementation Strategy is expressed in terms of [1] the volumes[25] of stormwater and non-stormwater to be managed by each jurisdiction to address Water Quality Priorities and [2] the control measures that will be implemented to achieve those volume reductions. The two primary elements of the Pollutant Reduction are as follows:

- **Compliance Targets**: for MS4 compliance determination purposes, the primary metric for EWMP implementation is the volume of stormwater managed by implemented control measures. The stormwater volume to be managed[26] is considered the BMP performance goal for the EWMP. To support future compliance determinations and adaptive management, the volume of stormwater to be managed is reported along with the capacities of control measures to be implemented by each jurisdiction in the EWMP Implementation Strategy.
- **EWMP Implementation Strategy**: the network of control measures that provides reasonable assurance of achieving the Compliance Targets is referred to as the EWMP Implementation

[25] Volume is used rather than pollutant loading because volume reduction is more readily tracked and reported by MS4 agencies. As described in Section 6.2.3, the volume reductions are actually a *water quality* improvement target based on required pollutant reductions.

[26] The reported volume is determined by tracking the amount of water that is be retained (and/or infiltrated) by BMPs over the course of a 24-hour period under the critical 90th percentile storm condition. Additional volume would be *treated* by these BMPs, but that additional treatment is *implicit* to the reported Compliance Targets. For compliance purposes the volume in the Compliance Target can either be retained and/or treated to concentrations below RWLs. Both would result in compliance.

Strategy. The identified BMPs (and BMP preferences) will likely evolve over the course of the EWMP implementation through an adaptive management paradigm and in response to "lessons learned." As such, it is anticipated the BMP capacities[27] within the various subcategories will be reported to the Regional Board but *not* tracked explicitly by the Regional Board for compliance determination. As BMPs are substituted over the course of EWMP implementation (*e.g.*, replace green street capacity in a subwatershed with additional regional BMP capacity), the Group will show equivalency for achieving the corresponding Compliance Target.

Additionally, the EWMP Implementation Strategy includes the implementation of the MCMs, which are not only required by the Permit, but also address the Category 2 and 3 WBPCs identified in Table 3-5.

7.2 Which Stormwater Control Measures Correspond to Final Compliance by 2021?

The EWMP will guide stormwater management in the Ballona Creek Watershed for the coming decades, and the LID, green streets and regional BMPs to be implemented have the potential to transform communities. The EWMP Implementation Strategy identifies the location and type of control measures for each jurisdiction for final compliance by 2021, which includes addressing all Water Quality Priorities including the limiting pollutants zinc and *E. coli* (as described in Section 6.2.4). The EWMP Implementation Strategy for final compliance is presented as follows:

- **Summary of total capacity of control measures for each jurisdiction across the entire BCWMA area.** Figure 7-1 summarizes control measure sub-categories that will be for each jurisdiction across the entire BCWMA. This figure provides both a summary by major categories (LID, green streets and regional BMPs) and subcategories within these major categories.
- **Detailed recipe for compliance including volumes of stormwater to be managed and control measure capacities**. The EWMP Implementation Strategy is detailed for each subwatershed in the BCWMA (generally 1 to 2 square mile drainages). Figure 7-2 and Figure 7-3 are maps of the "density" of control measure capacities to address metals and other Water Quality Priorities (through controlling zinc) and Figure 7-4 shows the additional control measure capacity required to address *E. coli*. The maps are shown in detailed tables in Appendix 7.A which present for each jurisdiction the volumes of stormwater to be managed in each subwatershed (Compliance Targets) and the control measures to achieve those volume reductions (EWMP Implementation Strategy). Note that separate Compliance Targets and EWMP Implementation Strategies are provided for Metals and Other Water Quality Priorities and *E. coli.* Index maps that correspond to the subwatershed IDs are provided in Appendix 7.B.

Additionally, the EWMP Implementation Strategy includes the implementation of the MCMs, which are not only required by the Permit, but also address the Category 2 and 3 WBPCs identified in Table 3-5.

The network of LID, green streets and regional BMPs in the EWMP Implementation Strategy represents approximately **eight Rose Bowls of BMP capacity**. Implementation of such a large network of control would represent a sea change in how stormwater will be managed in the Ballona

[27] While the EWMP Implementation Strategy reports the *total* BMP capacity to be implemented, that capacity is not a compliance target because some BMP capacities are sized to reflect a BMP program rather than sized to achieve the required reduction. For example, the BMPs implemented by the LID ordinance and the residential LID program were sized to retain the 85th percentile, 24-hour storm but that volume may be larger than is needed to achieve zinc RWLs. If those BMPs were replaced by a different type of BMP (e.g., regional BMP), the total BMP capacity may be smaller but just as effective.

Creek Watershed. The next subsection describes the timeline/sequencing for implementing the EWMP Implementation Strategy. The costs and financial strategy for the EWMP are presented in Section 9.

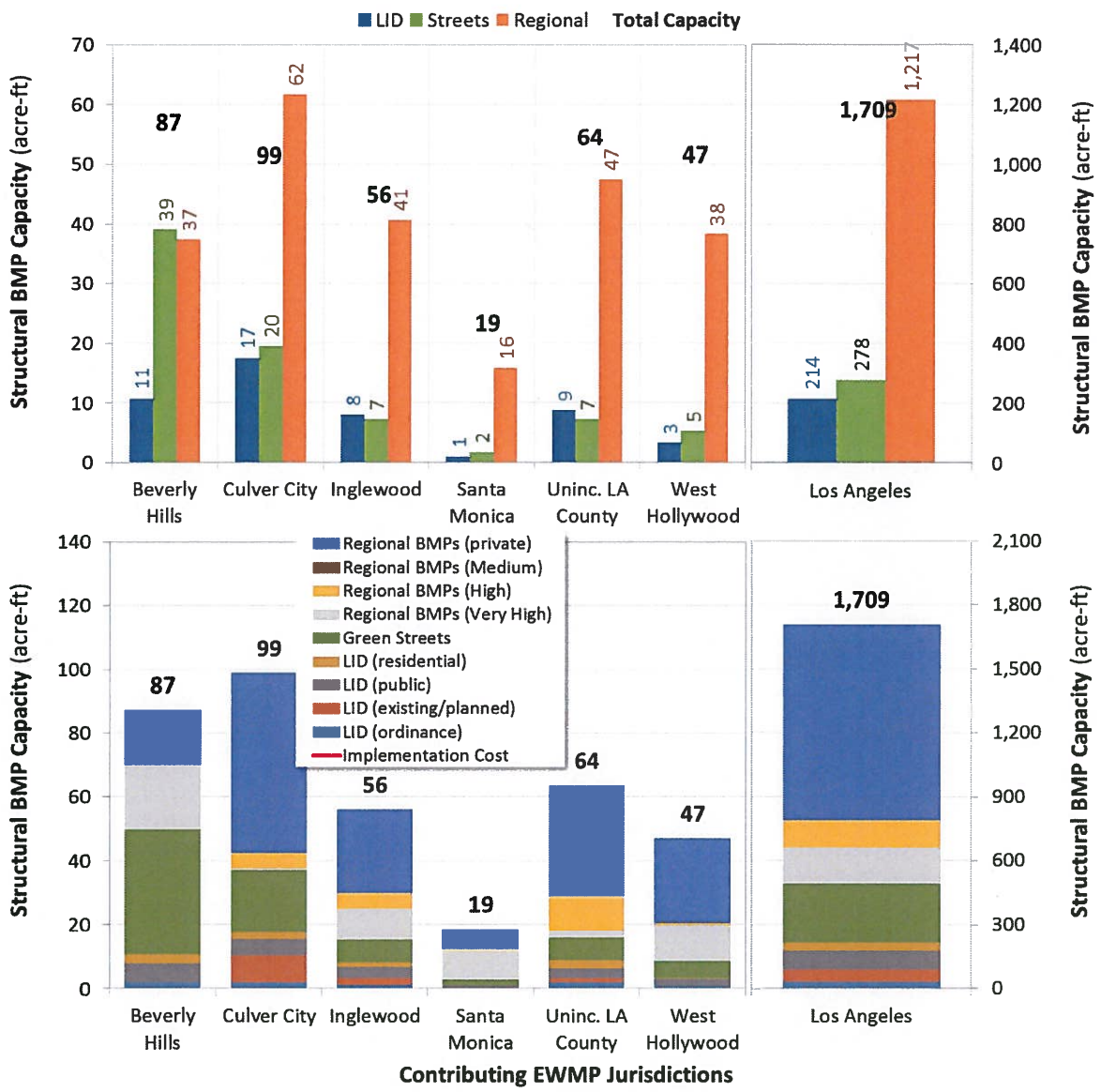


Figure 7-1 BC EWMP Implementation Strategy for Final Compliance by 2021[1]

1 - The two panels in Figure 7-1 show the total structural BMP capacity required for each BC EWMP jurisdiction to attain RWLs. The top panel groups the BMP types into LID, green streets, and regional BMPs, while the bottom panel provides more resolution for the BMP subcategories. Detailed BMP capacities for each jurisdiction by subwatershed are presented in Appendix 7.A. BMP capacities for each jurisdiction by assessment area are also presented in Appendix 7.C. Note that City of LA has a different scale.

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

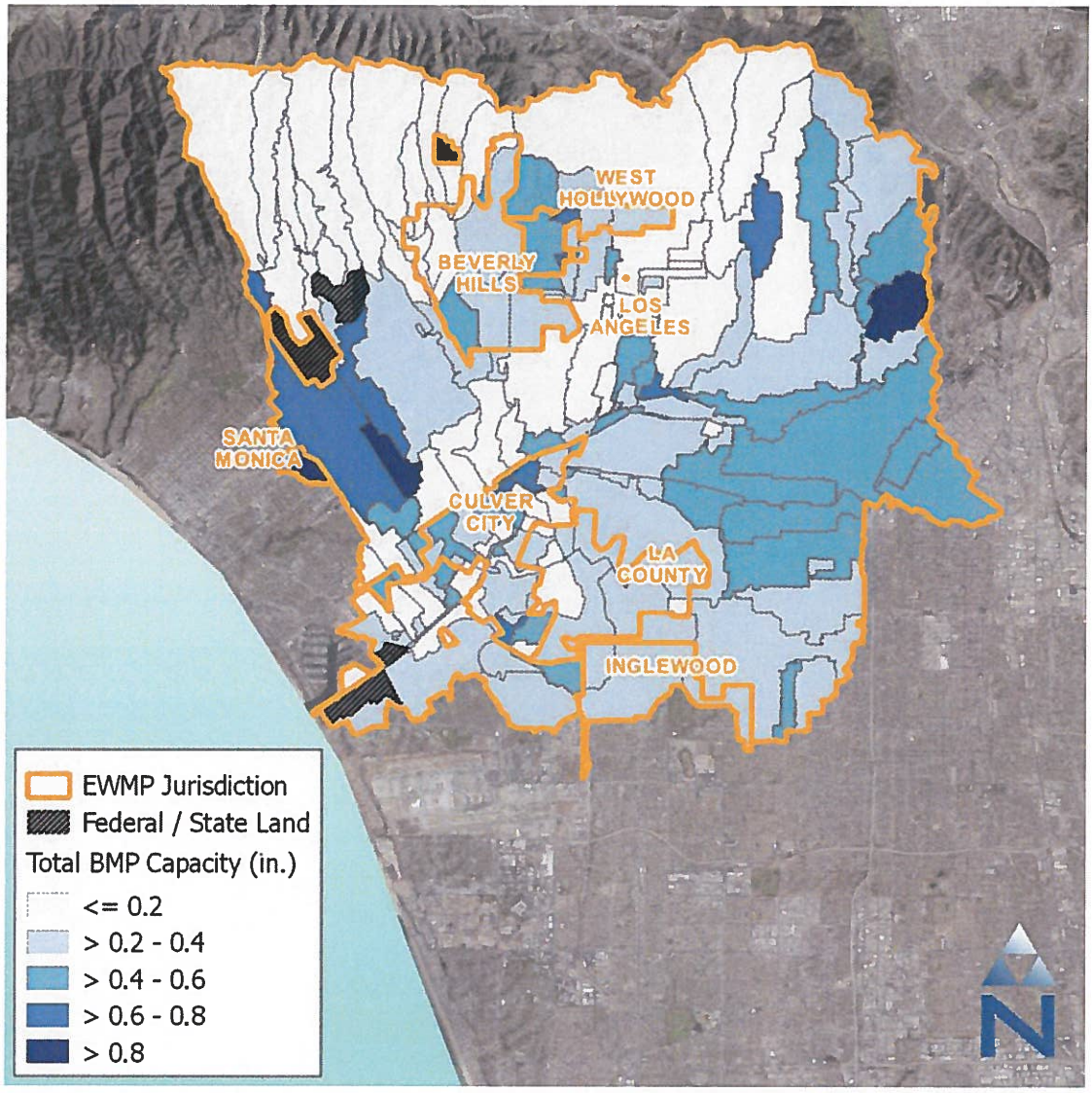


Figure 7-2 EWMP Implementation Strategy by Subwatershed for Metals and Other Water Quality Priorities (except *E. coli*)[1]

1 - Figure 7-2 presents the EWMP Implementation Strategy for metals and other water quality priorities as control measure "density" by subwatershed. The BMP density is higher in some areas [dark blue] because either [1] relatively high load reductions are required or [2] BMPs in those areas were relatively cost-effective (*e.g.*, due to high soil infiltration rates).The BMP capacities are normalized by area (*e.g.*, the BMP capacity for each subwatershed [in units of AF] was divided by the subwatershed area [in units of acres] to express the BMP capacity in units of depth [feet or inches]). Note that while all jurisdictions in an assessment area/watershed are held to an equivalent percentage reduction, subwatersheds within a jurisdiction may have variable reductions based on optimization (another reason why some subwatersheds within a jurisdiction are dark blue while others are light blue). The tabular version of this map is presented as a series of tables in in Appendix 7. A, and subwatershed index maps for each jurisdiction are presented in Appendix 7.B.

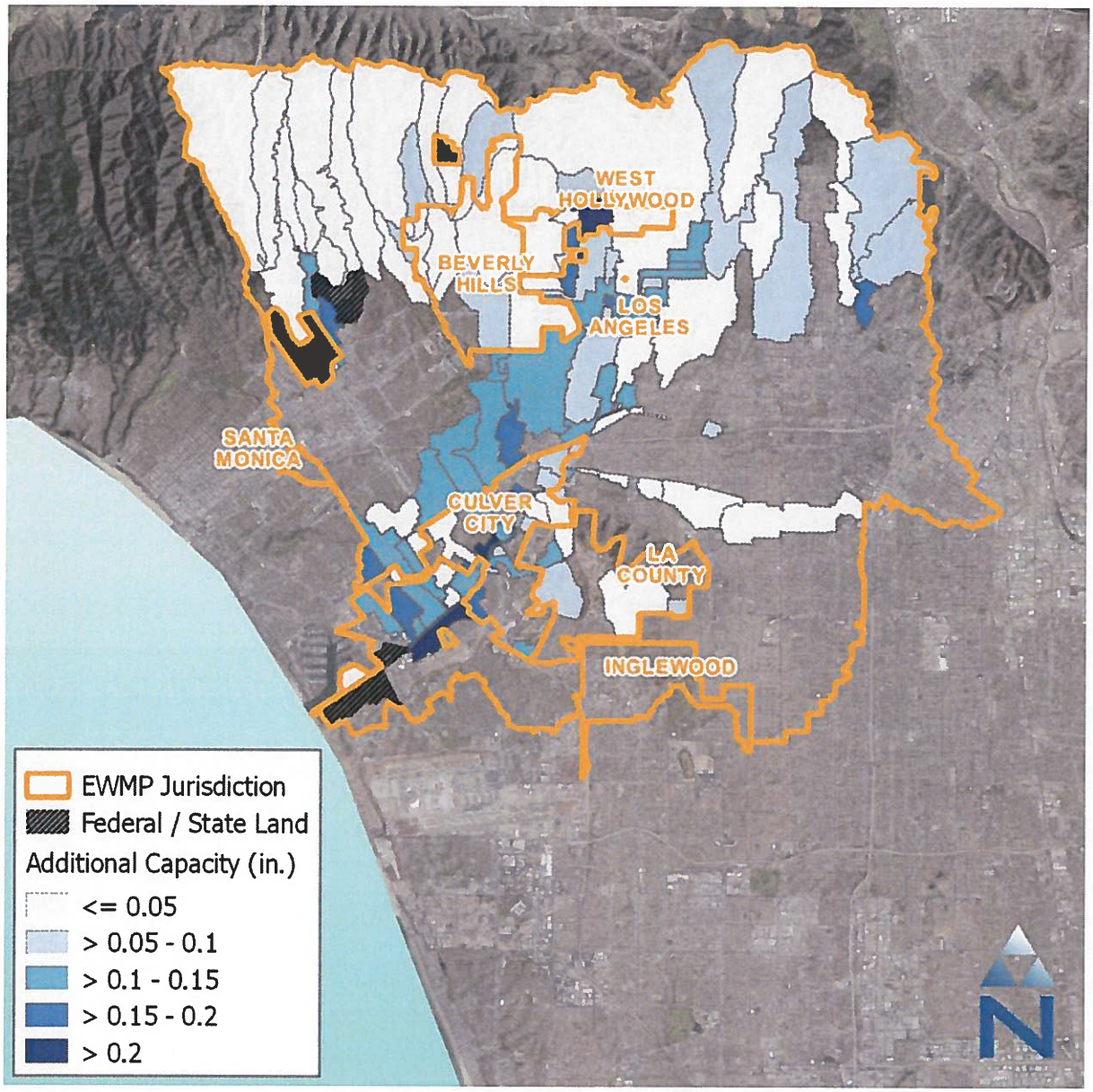


Figure 7-3 Additional Control Measures in EWMP Implementation Strategy to Address *E. coli*[1]

1 - Figure 7-3 uses the same approach as Figure 7-2 to present the additional capacity in the EWMP Implementation Strategy to address *E. coli* (beyond the control measures to be implemented to address zinc. Note the BMP capacities are much less than in Figure 7-2 because the control measures for zinc retain much of the critical bacteria storm. Some subwatersheds are not shaded because zero additional capacity is required to meet bacteria compliance targets. The tabular version of this map is presented as a series of tables in Appendix 7.A, and subwatershed index maps for each jurisdiction are presented in Appendix 7.B.

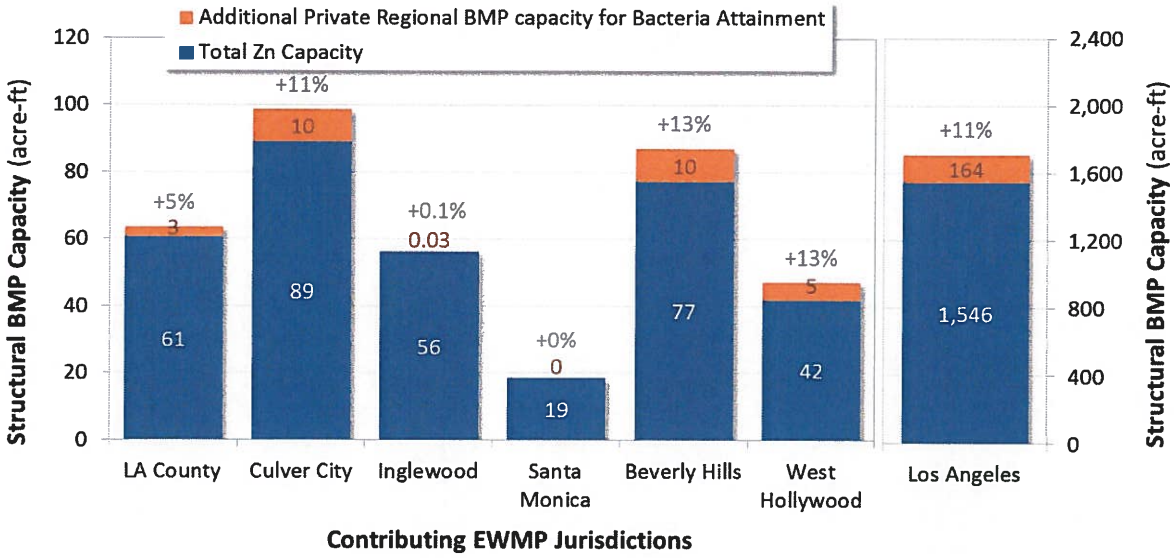


Figure 7-4 Additional Control Measures in EWMP Implementation Strategy to Address *E. coli*[1]

1 - The bars in Figure 7-4 represent the total control measure capacity in the EWMP Implementation Strategy, and the percentages at the top of the bars report the percent increase in capacity required by the RAA to control *E. coli* beyond the control measures for zinc. Note that City of LA uses a different scale

7.3 How are Stormwater Control Measures Scheduled to Achieve EWMP and TMDL Milestones?

As described in Section 3, the scheduling of LID, green streets and regional BMP implementation for the EWMP is based on the milestones of the BC Metals TMDL and also attainment of final compliance targets for the Bacteria TMDL and WBPCs identified in Table 3-5 by 2021, as follows[28]:

- Achieve 50 percent of the required zinc reduction by 2016;
- Achieve 25 percent of the reduction for WBPCs identified in Table 3-4 by 2017
- Achieve 100 percent of the required zinc reduction and WBPCs identified in Table 3-4 by 2021; and
- Final compliance with bacteria WQBELs by 2021.

The scheduling of the EWMP Implementation Strategy is presented as the following components:

[28] For WBPCs that are not addressed in a Regional Board approved TMDL, attainment of the percentages may be demonstrated either as a reduction in exceedance frequency at time of EWMP approval or percent area meeting the RWL or in the case of the USEPA adopted TMDLs reduction from the baseline at the time of TMDL promulgation or percent area meeting the WQBEL or RWL.

- **Summary of control measure capacities for jurisdictions in each assessment area/watershed**: Figure 7-5 through Figure 7-7 show the LID, green streets and regional BMP capacities that will be implemented over time to achieve TMDL milestones compliance targets. Separate panels are shown for each assessment area/watershed – Ballona Creek mainstem (Figure 7-5), Sepulveda Channel (Figure 7-6), and Centinela Creek (Figure 7-7). These capacities are also presented in detail in Appendix 7.C, organized by jurisdiction. For the metals TMDL, only the 50 percent milestone applies as a Permit limitation; the 25 percent and 75 percent milestones are shown for reference.

- **Summary of control measure capacities for each jurisdictions**: Shown in Figure 7-8 through Figure 7-14 are panels that summarize the EWMP Implementation Strategy for each individual jurisdiction including control measure scheduling.

- **Detailed scheduling for each jurisdiction including volumes of stormwater to be managed and control measure capacities**: detailed tables that present the scheduling by assessment area for each jurisdiction including volumes of stormwater (Compliance Targets) to be managed are presented in Appendix 7.C. Each jurisdiction has a standalone recipe for each assessment area/watershed.

Additionally, the EWMP Implementation Strategy includes the implementation of the MCMs, which are not only required by the Permit, but also address the Category 2 and 3 WBPCs identified in Table 3-5. The pace of implementation for the EWMP Implementation Strategy is rapid due to the compliance dates for the Ballona Creek Metals TMDL and Bacteria TMDL. The pacing of BMP implementation in Ballona Creek is among the fastest of all the EWMPs in LA County. Because the pace of implementation is directly proportional to required internal and financial resources, the additional required resources to implement the EWMP will be significant. The costs and financial strategy are presented in Section 9.

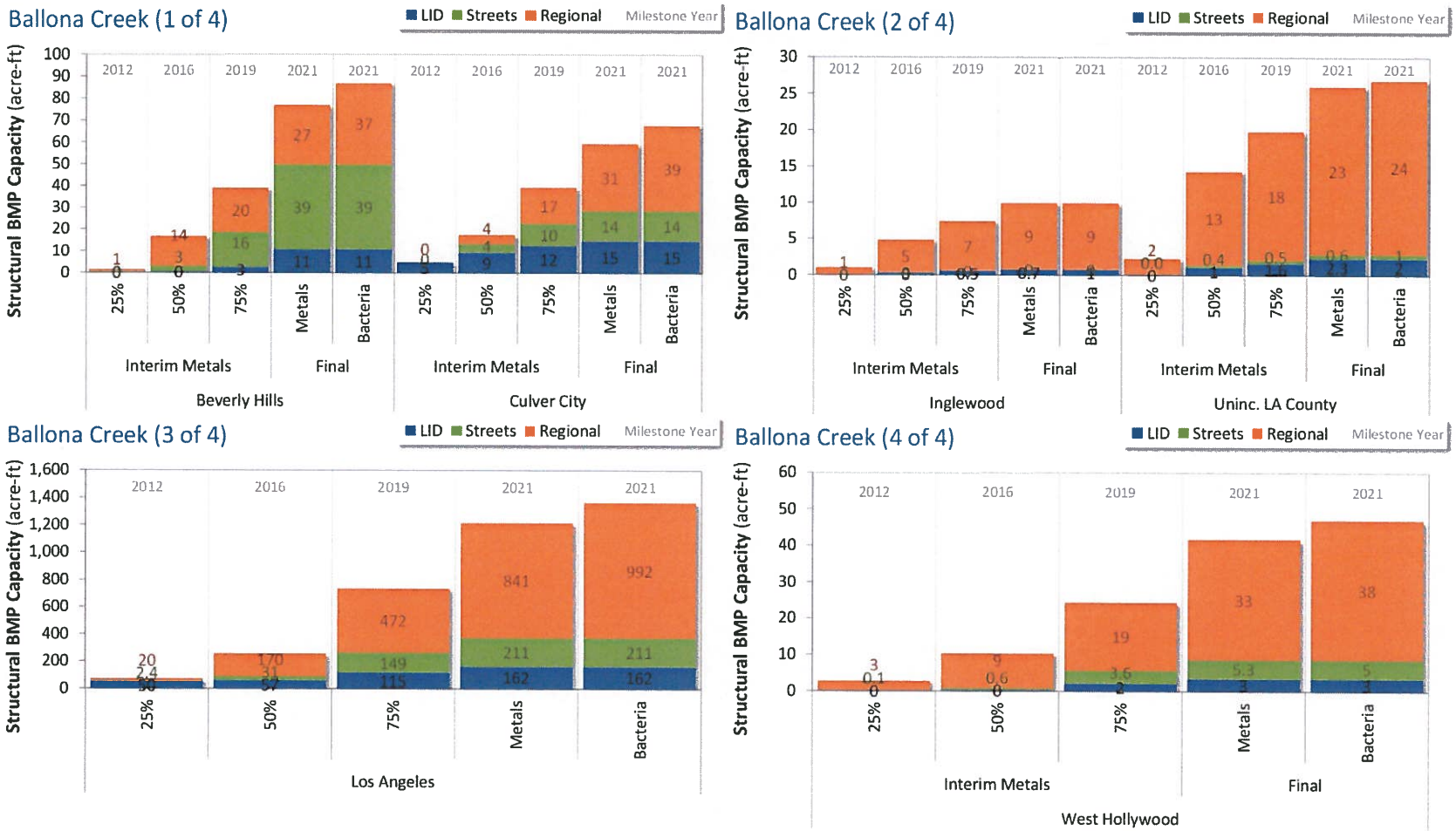


Figure 7-5 Ballona Creek: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone or compliance target. These capacities are also presented in detail in Appendix 7.C, organized by jurisdiction. For the metals TMDL, only the 50 percent milestone applies as a Permit limitation; the 25 percent and 75 percent milestones are shown for reference. Note that y-axis scales differ among panels.

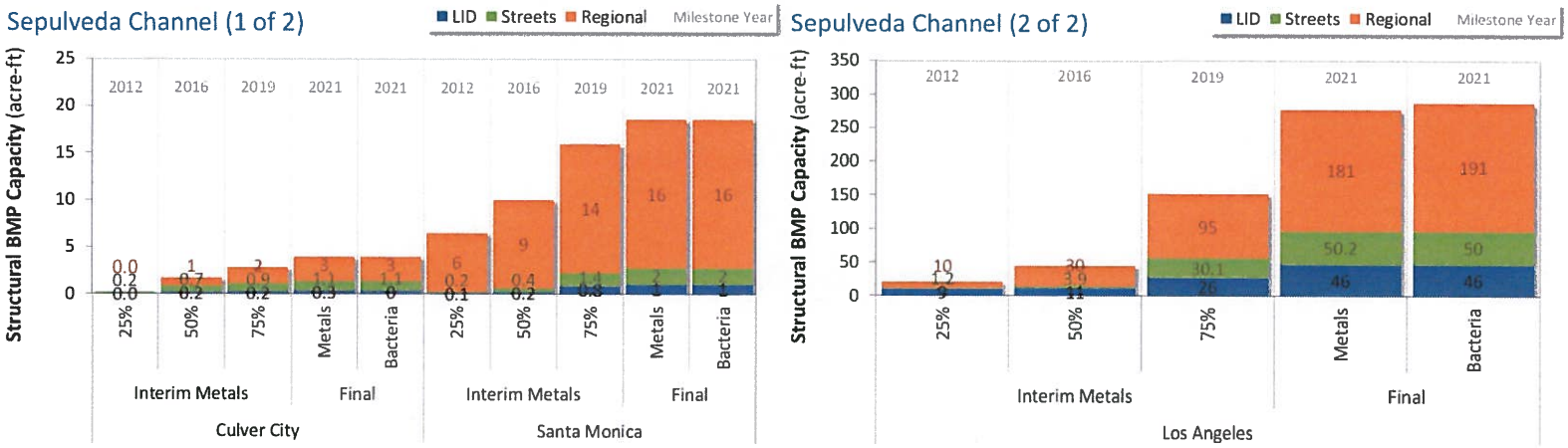


Figure 7-6 Sepulveda Channel: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

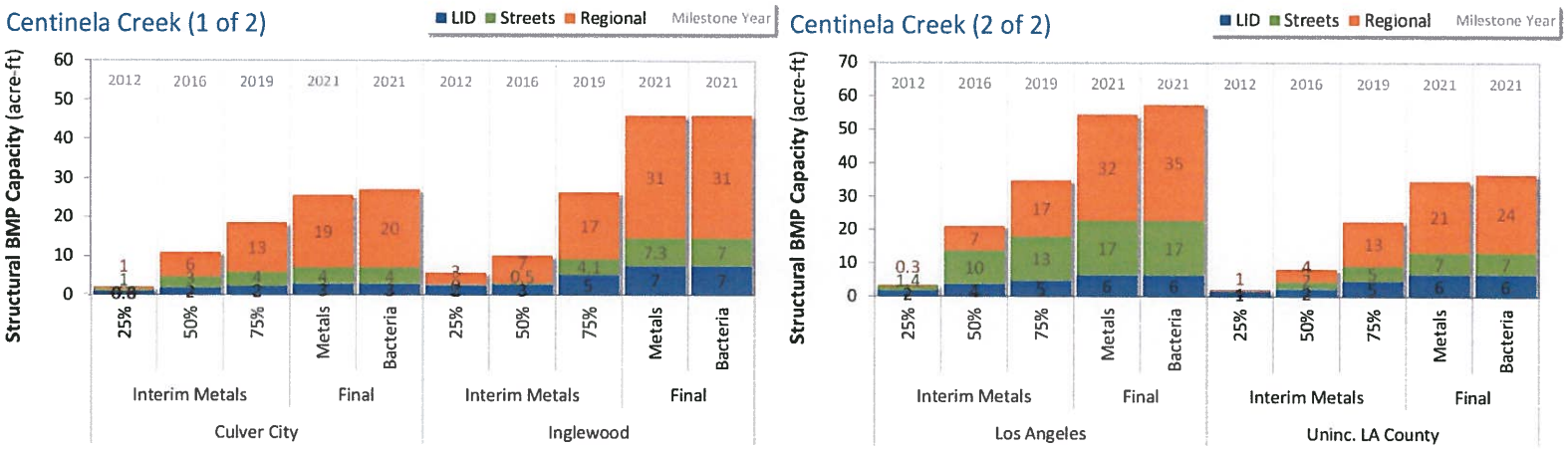


Figure 7-7 Channel: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green streets, and regional BMP capacity to achieve each EWMP/TMDL milestone. The capacities are also presented in detail in Appendix 7.C, organized by jurisdiction. For the metals TMDL, only the 50 percent milestone applies as a Permit limitation; the 25 percent and 75 percent milestones are shown for reference. Note that y-axis scales differ among panels.

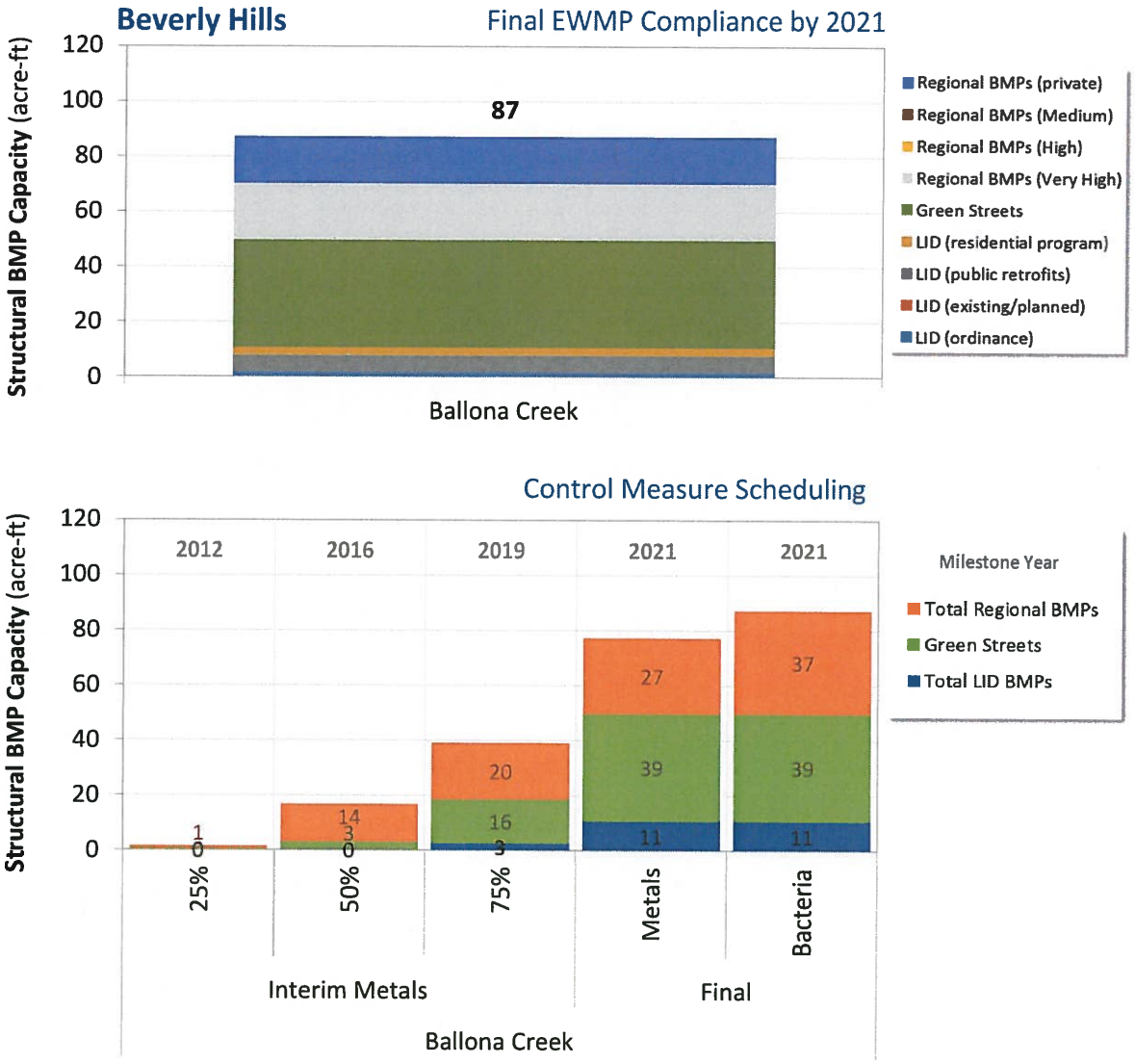


Figure 7-8 Beverly Hills: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021.The capacities are also presented in detail in Appendix 7C.

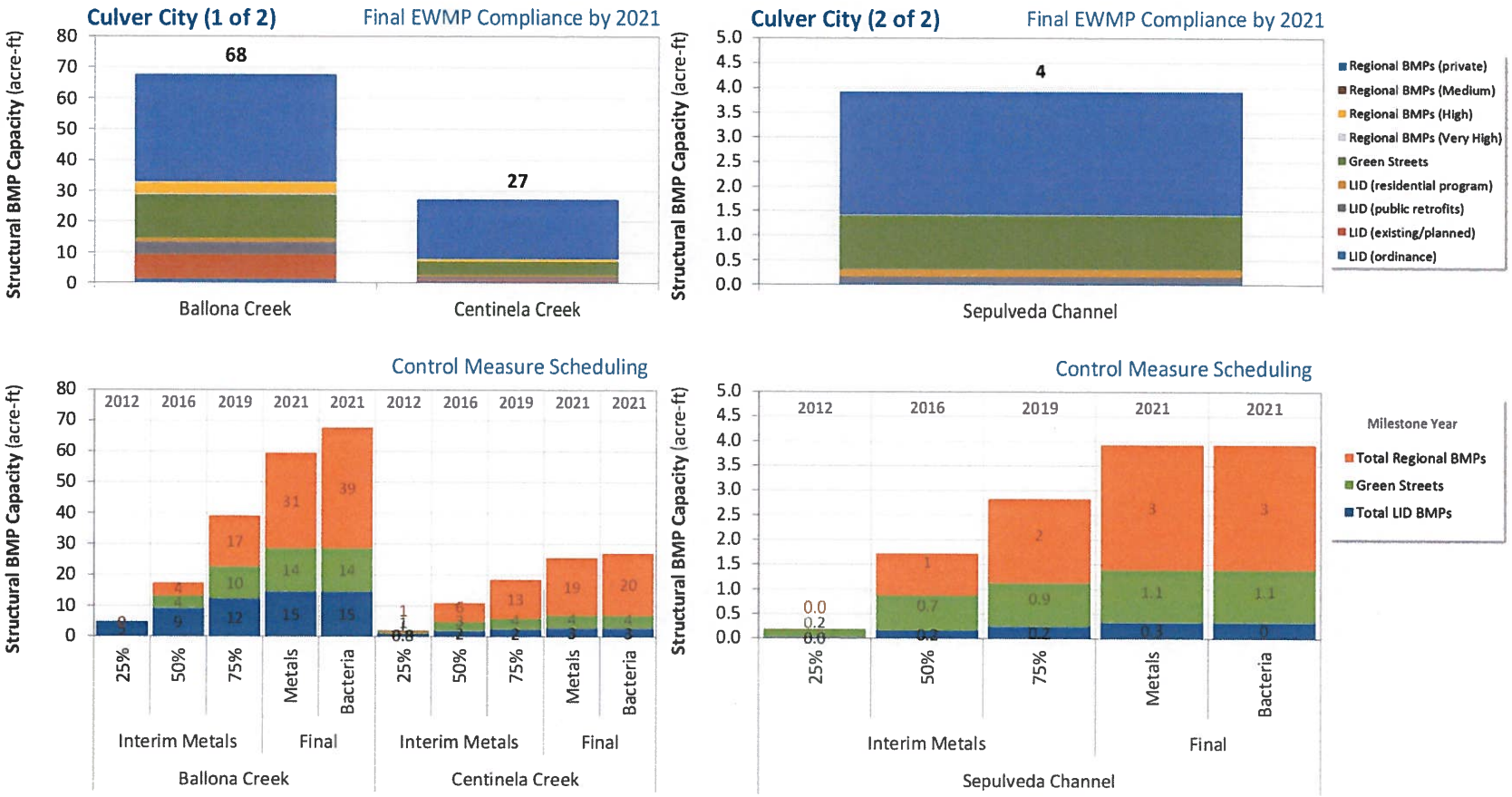


Figure 7-9 Culver City: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021. The capacities are also presented in detail in Appendix 7C. Note that y-axis scales differ among panels.

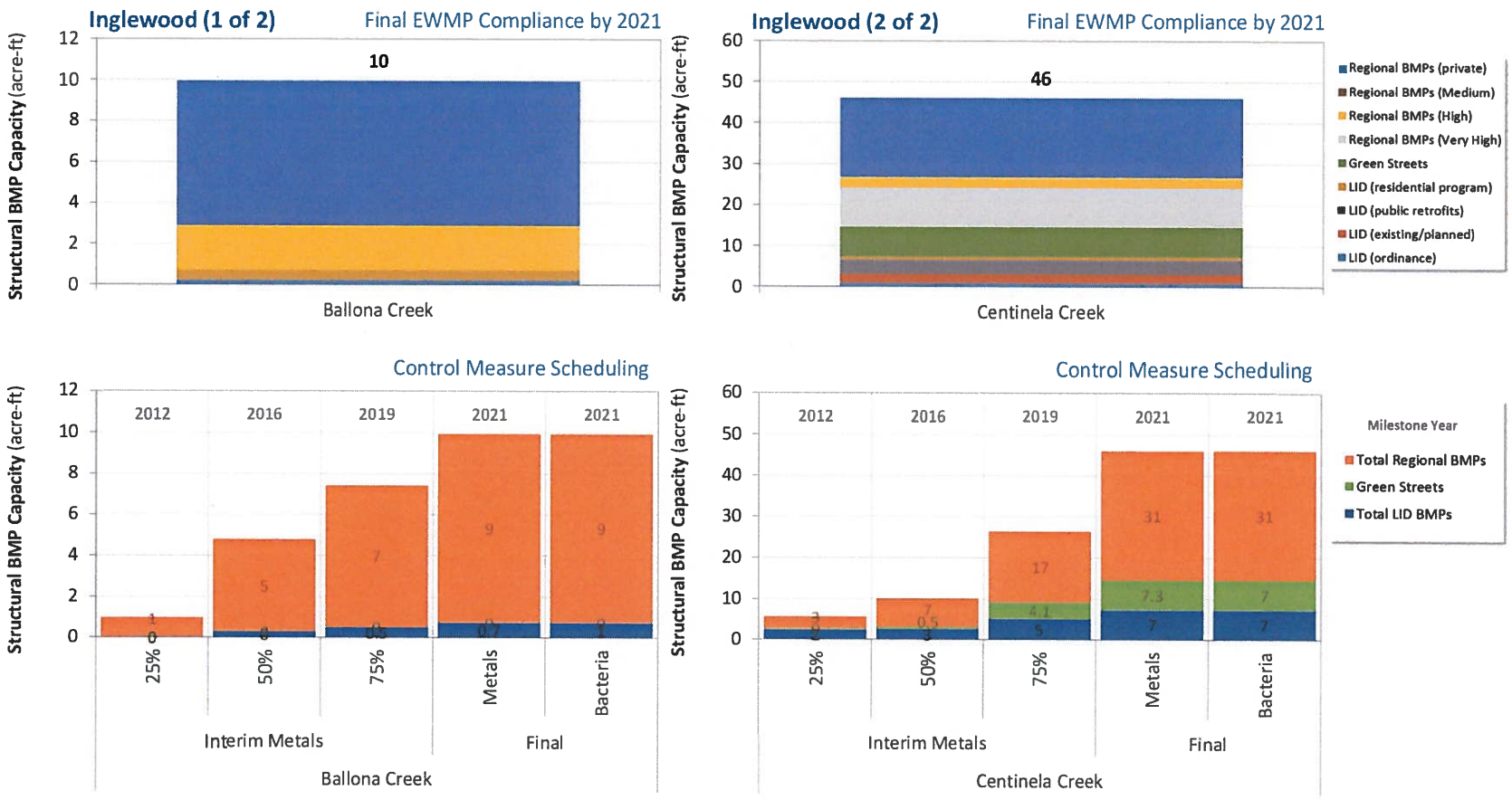


Figure 7-10 Inglewood: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021. The capacities are also presented in detail in Appendix 7C. Note that y-axis scales differ among panels.

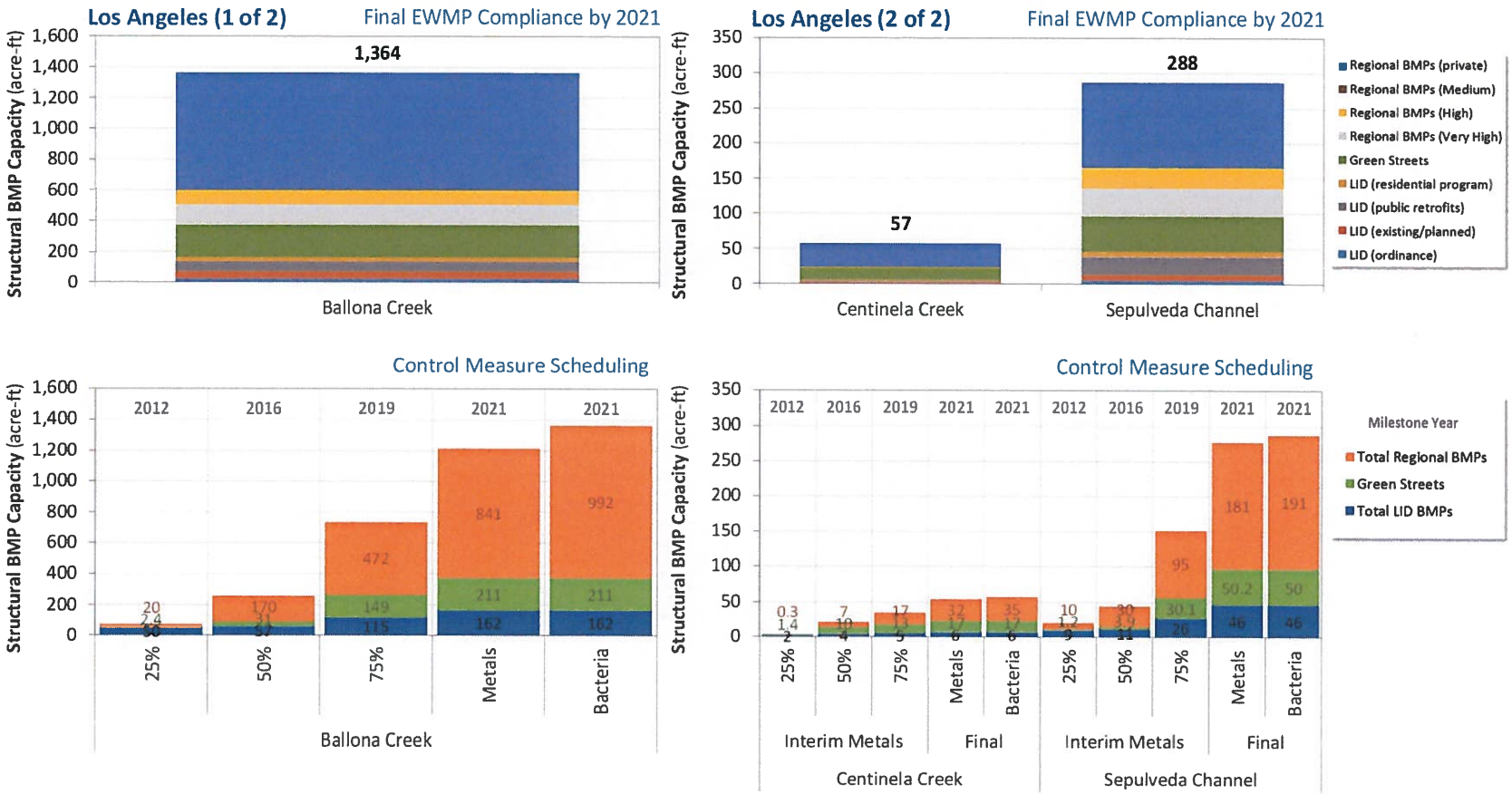


Figure 7-11 Los Angeles: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021. The capacities are also presented in detail in Appendix 7C. Note that y-axis scales differ among panels.

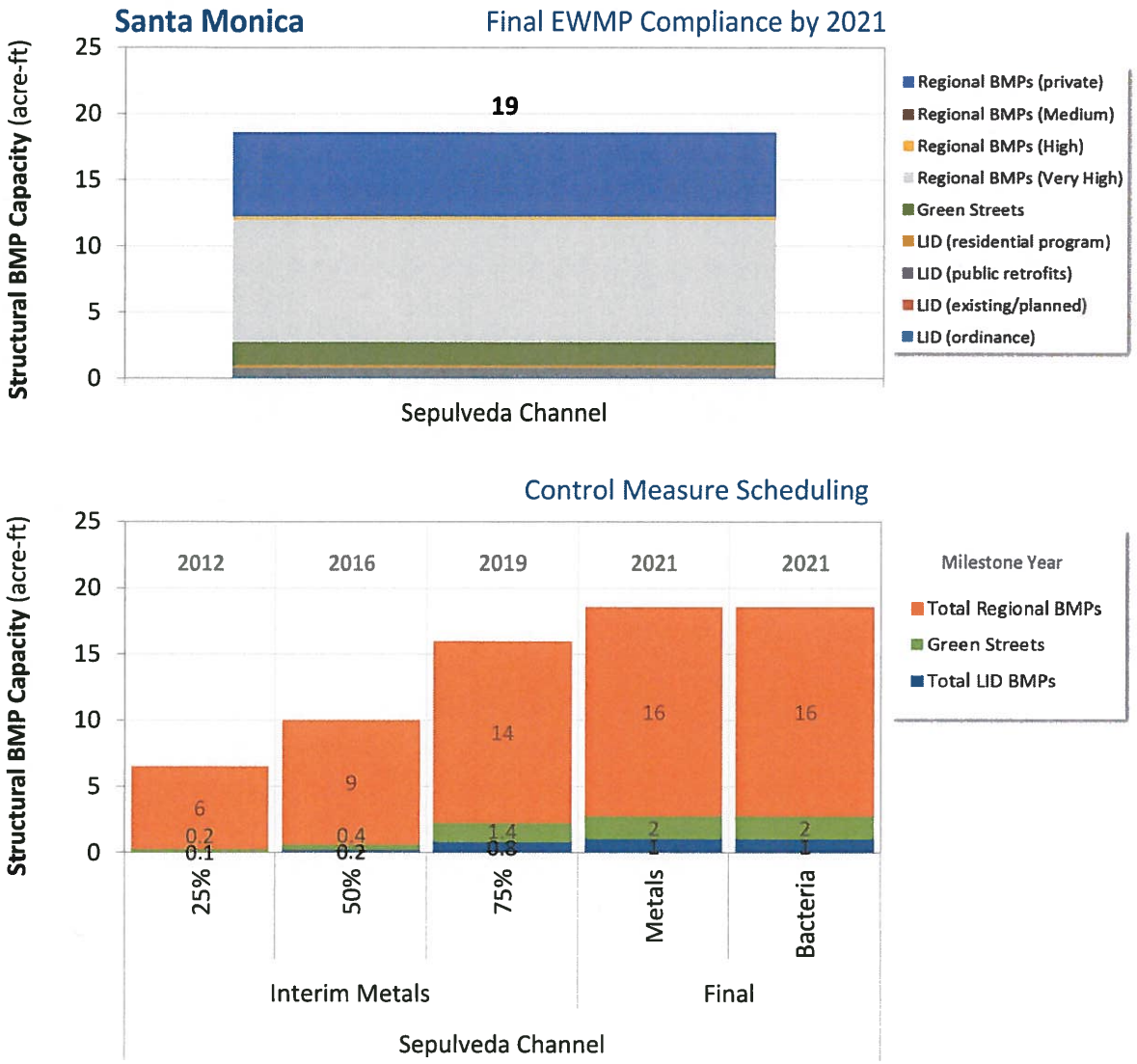


Figure 7-12 Santa Monica: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021. The capacities are also presented in detail in Appendix 7C.

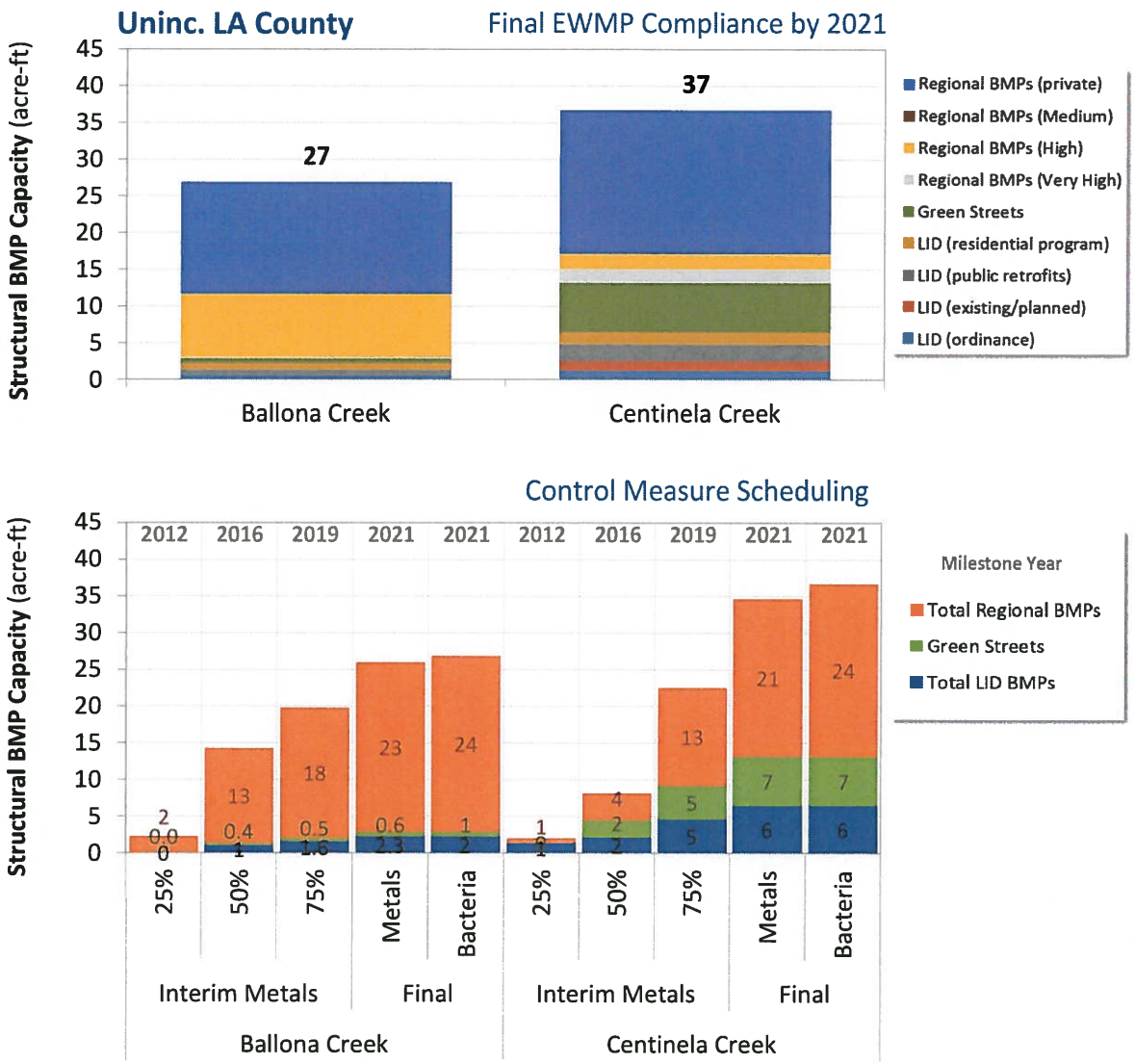


Figure 7-13 Uninc. LA County: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021. The capacities are also presented in detail in Appendix 7C.

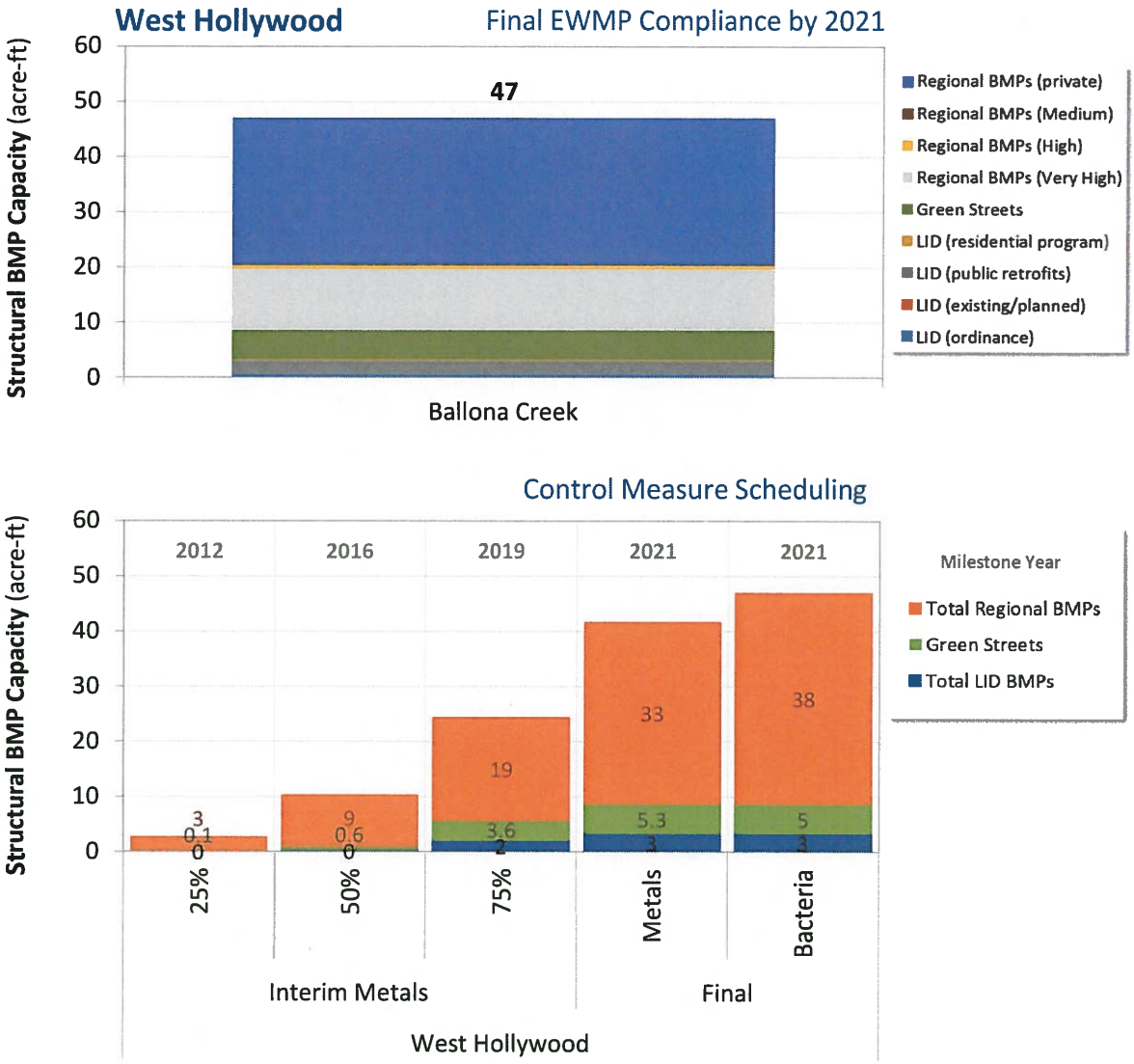


Figure 7-14 West Hollywood: Scheduling of EWMP Implementation Strategy to Achieve EWMP/TMDL Milestones

The bars represent the LID, green street and regional BMP capacity to achieve each EWMP/TMDL milestone. The top panel represents the BMPs to achieve final compliance in 2021; the bottom panel schedules them through 2021. The capacities are also presented in detail in Appendix 7C.

7.4 How will Non-Stormwater be Addressed by the EWMP?

The MS4 permit effectively prohibits non-stormwater discharges and the metals and bacteria TMDLs include milestones for attainment of dry-weather compliance targets. The EWMP Implementation Strategy provides assurance of eliminating non-stormwater discharges through implementation of the network of wet weather control measures. As shown in Figure 7-15, the EWMP Implementation Strategy achieves 100 percent elimination of non-stormwater flows by 2021. The following subsections consider attainment of RWLs for metals and bacteria (Section 6.B describes the dry weather RAA).

7.4.1 Dry-Weather Strategy for Metals

The final dry-weather compliance date for the Ballona Creek Metals TMDL is January 11, 2016 (see Section 2). The EWMP Implementation Strategy clearly addresses the dry weather RWLs of the metals TMDL as well as all other dry weather Category 1, 2 and 3 WBPCs identified in Table 3-4 and Table 3-5, as during dry weather, exceedances of metals RWLs are relatively rare, as described in Section 6.5.4. As such, *existing* MCMs and control measures have reasonable assurance of attaining dry weather metals RWLs (see Table 6-6) and represent the implementation actions required under this EWMP to comply with the TMDL requirements and receiving water limitations provisions of the Permit.

Additionally, the EWMP Implementation Plan RAA provides assurance of addressing metals RWLs for the following reasons:

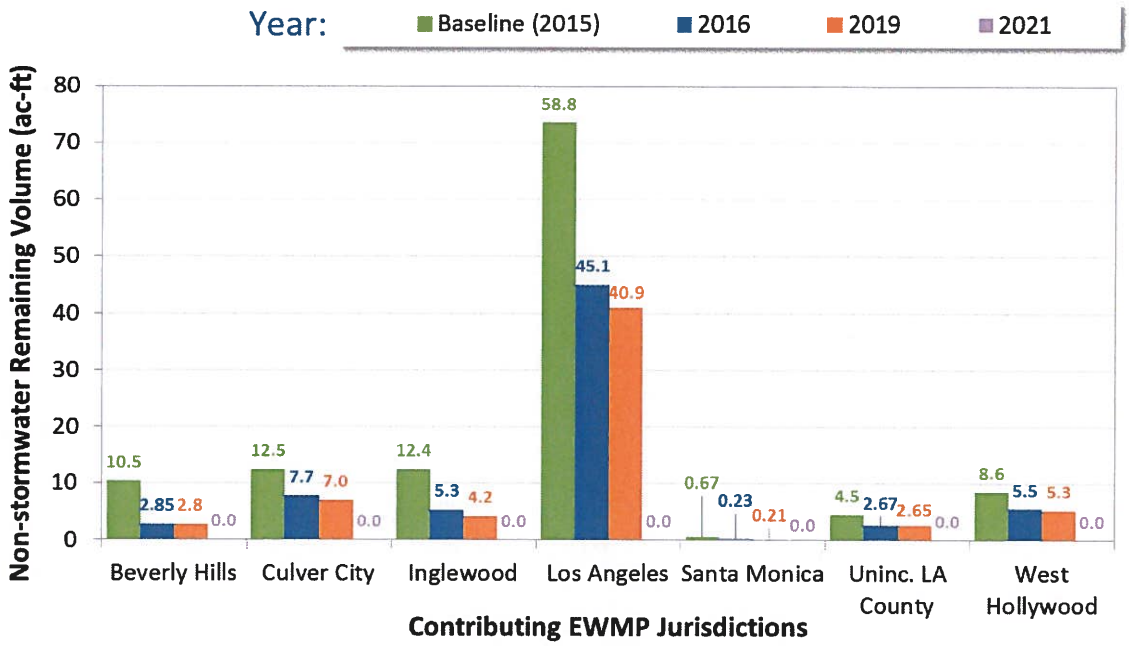
1. The non-stormwater screening, investigation and abatement programs being conducted under the CIMP for the BC EWMP Group will increase the rate of eliminating non-stormwater flows beyond the reductions provided by the control measures of the EWMP Implementation Strategy. In other words, the non-stormwater abatement programs provide a "margin of safety" for attainment of metals RWLs.

2. An additional margin of safety is provided by the assumed outdoor water use in the dry weather RAA (Section 6.2.3). The non-stormwater volumes in the non-stormwater analysis were based on existing median outdoor water use rates. Most water supply agencies have initiatives to significantly reduce outdoor water use in the coming years and thus the rate of elimination of non-stormwater flows should be more rapid than shown in Figure 7-15.

3. The non-stormwater volumes in the non-stormwater simulation were based on existing *median* outdoor water use rates. Most water supply agencies including the City of Los Angeles Department of Water and Power have initiatives to significantly reduce outdoor water use in the coming years. Regional reductions in outdoor water provide additional assurance of addressing dry weather Water Quality Priorities.

4. The dry weather control measures identified for bacteria (next subsection) are also anticipated to have a benefit for reducing metals concentrations.

Combined, these components of dry-weather strategy provide assurance that metals RWLs as well as the Category 1, 2, and 3 WPBCs will be attained.



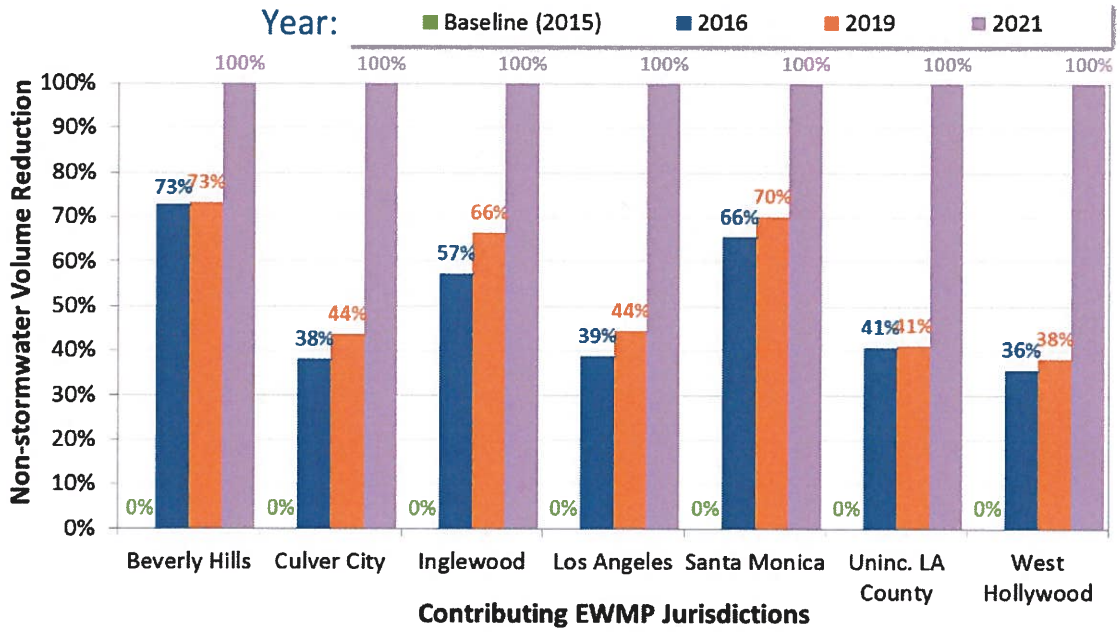


Figure 7-15 Schedule for Eliminating Non-Stormwater Discharges in Ballona Creek

7.4.2 Dry-Weather Strategy for Bacteria

The dry weather strategy for bacteria is based on control measures identified in the Time Schedule Order for the watershed. In particular, the following control measures are a component of the EWMP Implementation Strategy:

1. **North Outfall Treatment Facility**. The NOTF is in the process of being retrofitted to capture, disinfect and return[29] Ballona Creek flows along Reach 2. The disinfected effluent discharged from NOTF (sometimes referred to as Low Flow Treatment Facility #1) coupled with implementation of the Sepulveda Channel LFTF will lead to the attainment of RWLs in Ballona Creek.

2. **Sepulveda Channel LFTF.** A concept design has been developed for a facility that diverts non-stormwater flows prior to where Sepulveda Channel becomes an open channel. The Sepulveda LFTF will result in the attainment of RWLs in Sepulveda Channel and prevent discharges from the channel causing exceedances of RWLs in Ballona Creek.

The RAA simulation demonstrates that these two facilities will result in attainment of RWLs in Ballona Creek (Figure 7-16). Concentrations of *E. coli* have reasonable assurance of being less than single sample and geometric mean RWLs downstream of the NOTF. In Reach 1, where the REC-2 RWLs apply, current concentrations of bacteria are typically less and RWL exceedances are uncommon.

In addition to the two projects described above, the following projects or activities are important components of the dry weather strategy for bacteria:

1. **Centinela Creek Diversion Project**. A feasibility study and pre-design have been completed for a project that will intercept flows from Centinela Channel and prevent flows from the channel from causing exceedances of bacterial indicators in Ballona Creek Estuary.

2. **Non-stormwater screening, investigation and abatement programs**. As described for metals, non-stormwater abatement programs provide an additional "margin of safety" that *E. coli* RWLS will be attained. Note the non-stormwater program for Ballona Creek is integrated with outfall monitoring requirements of the bacteria TMDL, and thus the non-stormwater program will include measurement of *E. coli* in non-stormwater discharges.

3. **Region-wide reductions in outdoor water use**. With heightened awareness of drought conditions, it is anticipated that outdoor water use reductions will lead to reduced flows of non-stormwater.

Taken as a whole, the dry weather EWMP Implementation Strategy for addressing bacteria is robust because it includes an array of control measures, ranging from a large structural control measures (NOTF) to targeted outfall monitoring and abatement.

Wet-weather control measures in the EWMP Implementation Strategy are also able to mitigate non-stormwater discharges in the Ballona Creek Watershed (Figure 7-16). The top panel shows the estimated volume of non-stormwater being discharged as the EWMP schedule progresses, while the bottom panel shows the corresponding non-stormwater volumes reductions. Over time, the wet-weather control measures will help ensure elimination of remaining non-stormwater discharges along with other diversion and water use reduction strategies. The reductions to be achieved by the dry weather compliance dates from the Ballona Creek Metals TMDL are sufficient to achieve the milestones.

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[29] It is important to note that scenario shown is preliminary and subject to change – for example, the design of NOTF may be modified to divert of portion of flows to Hyperion Treatment Plan (rather than treat and release all intercepted flows).

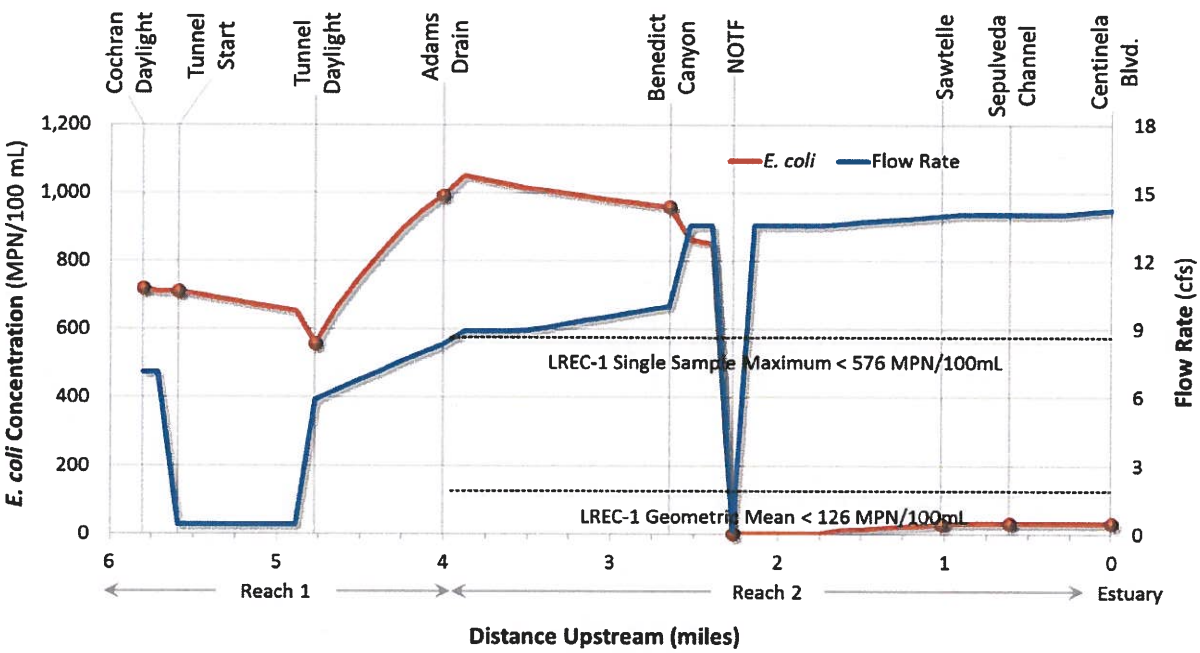

Figure 7-16 Concentration of E.coli in Ballona Creek with NOTF and Sepulveda Channel LFTF Operational

Figure 7-16 shows the result of QUAL2K modeling as described in Appendix 6.B. The NOTF and Sepulveda Channel LFTF provide reasonable assurance of attaining *E. coli* RWLs in Ballona Creek. Note the geometric mean WQO of 126 MPN per 100 mL does not apply to Reach 1. It is important to note that scenario shown is preliminary and subject to change – for example, the design of NOTF may be modified to divert of portion of flows to Hyperion Treatment Plan (rather than treat and release all intercepted flows).

7.5 Which Institutional Control Measures are included in the EWMP?

The MS4 Permit requires extensive programs for institutional control measures, referred to as MCMs. The "default" MCMs in the Permit are an important element of the EWMP Implementation Strategy[30] for the BC EWMP Group. See Section 5.6 for a comparison of the 2001 and 2012 MCM requirements. The MCMs in the 2012 Permit represent a significant increase in effort compared to the 2001 Permit. These default MCMs provide the foundation for the EWMP. Additionally, Category 2 and 3 WBPCs, which have very low exceedance frequencies, will be addressed by MCMs and associated control measures. However, the MCMs may need to be modified to specifically target low exceeding pollutants if exceedances are seen subsequent to full implementation of the MCMs identified in the MS4 Permit (June 2015).

[30] The RAA assumed a 5% reduction in pollutants due to implementation of default MCMs required in the Permit. The MCMs in the 2012 Permit are significantly enhanced from those in the 2001 Permit, and thus a 5% reduction is a reasonable (likely conservatively low) estimate of MCM performance.

Section 8
Compliance Determination and Adaptive Management Framework

At its core, the EWMP is a regulatory document to support compliance determination with the MS4 Permit, and over time the EWMP will be adapted to become more effective as new program elements are implemented, regulations evolve and additional information and data are gathered. This section discusses the anticipated approach to compliance determination and discusses key elements of adaptive management. Adaptive management is a critical component of the EWMP implementation process, as the first EWMP looks to 2021 and dynamic watershed conditions, stormwater science and water quality regulations will certainly change over the coming decades. Over time, monitoring data collected by the CIMP will provide information on water quality conditions and the effectiveness of control measures, which can be compared to predictions by the RAA. In addition, EWMP members will update their EWMP Implementation Strategy based on new identified opportunities (*e.g.*, identifying a newly available public parcel for siting a regional project) and/or lessons learned during control measure implementation (*e.g.*, preferring one type of control measure over another).

8.1 Compliance Determination

As described in Section 1.2, the EWMP is a regulatory document that supports compliance determination through an optional compliance pathway for the MS4 Permit. Figure 8-1 provides an illustration of the process for compliance determination, based on the "Compliance with Receiving Water Limitations Not Otherwise Addressed by a TMDL through a WMP or EWMP section of the Permit (page 49) and the TMDL Compliance Determination" section of the Permit (starts on page 141). Without an EWMP, compliance determination would be based on comparison of monitoring data collected by the CIMP to RWLs and/or WQBELs. By developing and implementing an approved EWMP, the BC EWMP Group is provided another pathway for compliance determination. However, it is important to note the EWMP Implementation Strategy is not a standalone compliance requirement; determination of compliance always starts with review of receiving water monitoring data. If RWLs are not achieved, then compliance determination considers outfall monitoring data. Furthermore, areas that are addressed by a regional project that retains the 85th percentile, 24-hour storm are individually compliant with all RWLs and WQBELs of the Permit. Finally, if RWLs and WQBELs are not achieved and runoff is not addressed through retention of the 85th percentile, 24-hour storm, then compliance determination is based on whether the control Compliance Targets and/or control measures in the EWMP Implementation Strategy have been achieved/implemented per the compliance schedule.[31]

[31] See Section 7.1 for description of Compliance Targets, which are expressed in terms of the volume of stormwater runoff managed during a 24-hour period under the critical condition. Compliance Targets for each jurisdiction and assessment area/watershed are detailed in Appendix 7.A (final compliance) and Appendix 7.C (scheduling for milestones). For compliance with dry weather RWLs, the non-stormwater control measures described in Section 7.4 are used for compliance determination.

As outlined in Table 8-1, compliance should be determined separately for each constituent and condition (wet or dry).[32] While the limiting pollutant analysis determined the control measures that will address all pollutants, it is not *necessary* to fully control zinc and *E. coli* to address the other Water Quality Priorities. For example, exceedances of metals during dry weather are rare and thus MCMs and associated control measures have reasonable assurance of attaining metals RWLs during dry weather. Similarly, for Category 2 and 3 WBPC, which also have very low exceedance frequencies (identified in Table 3-7), MCMs and associated control measures have reasonable assurance of attaining RWLs during dry weather. As such, if exceedances of metals during dry weather or exceedances of Category 3 WBPCs identified in Table 3-7 occur during EWMP implementation, then compliance determination should *not* be based on the status of implementation of zinc and *E. coli* control measures. Instead, compliance determination should be based on evaluation of whether the existing level of implementation for MCMs and control measures (as of June 2015) has been maintained and adapted, if necessary, to meet final limitations.

Table 8-1 WMP Control Measures to be Assessed for Compliance Determination with ULAR EWMP if RWLs and WQBELs are not Attained per the Timelines Prescribed in the Permit and EWMP

Weather Condition	Pollutant	Control Measures to be Evaluated for BMP-based Compliance	Milestones and Implementation Schedule
Wet weather	Copper and Zinc	Control Measures detailed in Appendix 7A and 7C	Table 3-1 and Appendix 7C
	E. coli	Control Measures detailed in Appendix 7A and 7C	
	Toxics	Control Measures detailed in Appendix 7A and 7C	
	Category 2 pollutants	MCMs in 2012 MS4 Permit and modifications made during adaptive management, as needed.	See Table 3-5 and Table 3-7
	Category 3 pollutants		
Dry weather	Copper and Zinc	MCMs in 2012 MS4 Permit and modifications made during adaptive management, as needed. Also, Implementation of non-stormwater abatement program in CIMP	See Table 3-1
	E. coli	Control measures in Time Schedule Order	See TSO
	Category 2 pollutants	MCMs in 2012 MS4 Permit and modifications made during adaptive management, as needed. Also, Implementation of non-stormwater abatement program in CIMP	See Table 3-5 and Table 3-7

An important element of the current Permit provisions is that determination of compliance with final limits of Regional Board adopted TMDLs (see Table 3-1) does not consider whether the EWMP Implementation Strategy has been completed; instead compliance determination is solely based on review of receiving water and outfall monitoring data. However, given rigor by which the EWMPs have been developed, there is optimism that future iterations of the Permit will add compliance with final limits (not just interim) as a component of EWMP compliance determination (as discussed in the Permit Fact Sheet).

[32] An exception would be areas that drain to regional projects that manage the 85th percentile, 24-hour storm.

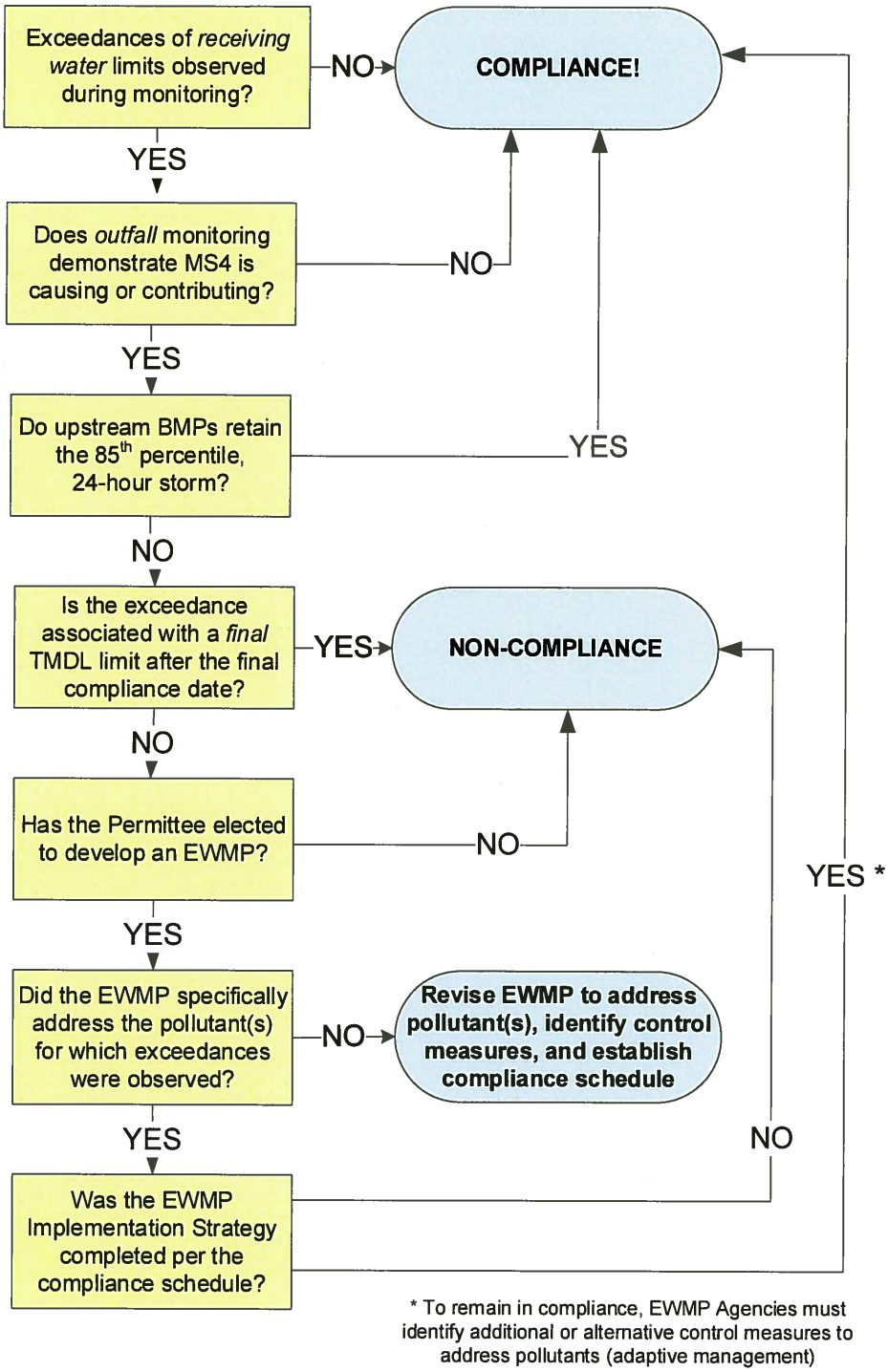

Figure 8-1 MS4 Permit Compliance Determination Process

8.2 Adaptive Management Framework

The Permit specifies the adaptive management process will be revisited every two years to re-evaluate the EWMP and update the program as necessary. Part VI.C.8 of the Permit identifies the adaptive management process as follows:

i "Permittees shall implement an adaptive management process, every two years, adapting the EWMP to become more effective, based on, but not limited to a consideration of the following:

1. Progress toward achieving interim and/or final WQBELs and/or RWLs.
2. Achievement of interim milestones.
3. Re-evaluation of water quality priorities and source assessment.
4. Availability of new information other than the Permittees' monitoring program.
5. Regional Water Board recommendations.
6. Recommendations through a public participation process.

ii Based on the results of the adaptive management process, Permittees shall report any modifications necessary to improve the effectiveness of the EWMP in the Annual Report.

iii Permittees shall implement any modifications to the EWMP upon approval by the Regional Board or within 60 days of submittal if the Regional Board expresses no objections."

The EWMP adaptive management process will incorporate new monitoring data collected through implementation of the CIMP or other programs, experience gained from BMP implementation, and/or changes to the water quality standards (*e.g.*, beneficial uses or WQBELs and/or RWLs). The process will define modifications necessary to improve the effectiveness of the EWMP in order to achieve compliance targets. Key factors to be considered during the adaptive management process are described below.

8.2.1 Updates to Water Quality Priorities

A key consideration of the adaptive management process of the Permit is Part i.3, the re-evaluation of Water Quality Priorities. The BC EWMP Group envisions that the EWMP, CIMP and special studies will lead to revisions to the Water Quality Priorities through basin planning in the coming years. Examples of these revisions include the following:

- **Updates to TMDL implementation schedules** – the pace of control measure implementation required by TMDLs in the BC watershed is rapid, far above corresponding funding that is available for stormwater programs. The milestones for the BC Metals and Bacteria TMDLs are especially problematic given their short timeframe (2016). The EWMPs provide some of the first comprehensive cost estimates for implementation of the RWLs and WQBELs in the MS4 Permit (presented in next section), and they could be used to support revisions to TMDL implementation schedules during upcoming TMDL reopeners. While the BC EWMP Group anticipates stormwater funding to increase in the coming years (as described in the next section), the TMDL schedules for near-term milestones could be adjusted to reflect currently available funding while still ensuring that commitments are made to achieving continuous incremental improvements in water quality.

- **Revisions to Water Quality Objectives** – through special studies and regulatory updates, RWLs (and water quality objectives) can be improved to incorporate the most recent scientific information and/or site-specific data. Studies for site-specific objectives could be conducted for the limiting pollutants zinc and bacteria in the BC watershed. For zinc, a water effects ratio (WER) should considered for the Ballona Creek and its associated waterbodies. For bacteria, federal regulations include a process for developing site-specific RWLs based on alternative indicators and/or risk assessment. The RWLs for other pollutants could also be updated as regulations are updated by the Regional Board and State Board to reflect the best available science and/or scientific studies are conducted to support Basin Plan Amendments.

- **Updates to beneficial uses** – for some Water Quality Priorities, the designated beneficial uses in the Basin Plan could be updated based on up-to-date use information. As an example, the State Board is considering updates to statewide water quality objectives for bacteria, including an expanded application of the High Flow Suspension (HFS) to non-engineered channels. The Basin Plan currently only applies to the HFS to beneficial uses for engineered channels. Through the statewide update, the HFS could be expanded to BC waterbodies, which would reduce the amount of regional projects on private land that are currently included in the EWMP Implementation Strategy.

- **Revisions to Water Quality Priority categories** – for some Water Quality Priorities, the pollutants will benefit from additional monitoring data collected by the CIMP. New monitoring data may result in the re-characterization of receiving water and discharge quality within the BC EWMP area. The monitoring data may show changes in constituents exceeding applicable water quality objectives, resulting in potential updates to the categories. For example, pollutants may be de-listed as control measures are implemented, or some pollutants may be demonstrated to be from non-MS4 sources.

The BC EWMP Group looks forward to closely working with the Regional Board and stakeholders on these and other revisions to the Water Quality Priorities

8.2.2 Updates Based on Reviews of the Monitoring Data

Monitoring data gathered from the CIMP or other monitoring programs (*e.g.*, specific studies) on receiving water conditions and stormwater/non-stormwater quality will support adaptive management at multiple levels. This information will be tied into the EWMP as feedback for the water quality changes resulting from control measures implemented by the BC EWMP Group. For example, the data could show the required reductions are less than anticipated which would could eventually lead to reduced capacities of control measures in the EWMP Implementation Strategy.

An Integrated Monitoring Compliance Report will be provided as part of the Annual Report that summarizes all identified exceedances of (1) outfall-based stormwater monitoring data, (2) wet-weather receiving water monitoring data, (3) dry-weather receiving water data, and (4) non-stormwater outfall monitoring data against all applicable WQBELs, RWLs, non-stormwater action levels, and aquatic toxicity thresholds. An effectiveness assessment of stormwater and non-stormwater control measures will be conducted as to whether the quality of discharges is improving, staying the same or declining.

8.2.3 Updates to the RAA Model Parameters

Over time, the parameters in the watershed and BMP models used for the RAA may be updated based on newly available data. For example, as additional control measures are implemented in LA County, new data may become available regarding performance of control measures for reduction pollutants.

In turn, the performance metrics in the RAA could be updated. Other types of data that could support RAA updates include soil infiltration data, revised catchment delineations, modified operations to impoundments/reservoirs, changes in rainfall patterns, water conservation efforts, and major changes to the quality or volume of effluent discharges from POTWs.

8.2.4 Updates to Preferences for Control Measure Implementation

Over the course of EWMP implementation, BC EWMP Group members have the flexibility to substitute different types of control measures based on lessons learned that affect preferences for implementing certain BMPs. As long as the Compliance Targets are achieved (*e.g.*, specified volumes of stormwater are managed), the type of control measure implemented does not affect compliance determination. As the EWMP is implemented over time, it is *expected* that refined strategies will identify a different suite of opportunities or different BMP designs from that which was assumed for the RAA. It will, therefore, be important to track BMP implementation so adjustments can be made when checking progress towards achieving Compliance Targets. To illustrate how control measure preferences could be modified during adaptive management, an example is provided below and in Figure 8-2.

In Figure 8-2, the "recipe for compliance" is split to emphasize that the Compliance Targets (on the left-hand side) are fixed, enforceable goals, whereas the plan (on the right-hand side) is subject to adaptive management. The objective is for each BC EWMP Group member to meet the Compliance Target (left-hand side) and manage a certain amount of runoff in a 24-hour period with a suite of BMPs. The right-hand side represents the control measures identified by the RAA based on the assumptions described in Section 6. However, over time, the EWMP Implementation Strategy will be adjusted. In some cases, it may be possible to use alternative control measures or designs in such a way that the overall constructed size (and associated cost) of the suite of BMPs is reduced. Three scenarios to consider as examples are provided below.

(Current Fixed Goal) | (Flexible)

COMPLIANCE TARGETS: MEASURABLE AND ENFORCEABLE BMP GOAL | **EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT** (BMP capacity expressed in units of acre-feet)

	For Metals by 2026	For Bacteria by 2040	For Metals Attainment by 2021											For Bacteria Attainment by 2021	
				Low-Impact Development				Streets	Regional BMPs						
	24-hour Volume Retained (acre-ft)	Additional 24-hour Volume to be Retained (acre-ft)	% Load Reduction Critical Condition	Ordinance	Planned LID	Public LID	Residential LID	Green Streets	Very High (public, owned)	High (public, owned)	Medium (public, non-owned)	Private	Total BMP Capacity (acre-ft)	Regional BMPs (private)	Total BMP Capacity (acre-ft)
	13.81	3.81	41%	0.49	0.30	0.40	0.87	5.92	0.00	0.29	0.00	0.00	**8.3**	3.81	**12.1**
Scenario 1:			41%	0.49	0.30	0.40	0.87	8.92	0.00	0.29	0.00	0.00	**11.3**	1.00	**12.3**
Scenario 2:			41%	0.49	0.30	–	4.35	8.92	0.00	0.29	0.00	0.00	**14.4**	–	**14.4**
Scenario 3:			41%	0.49	0.30	–	0.87	–	–	–	–	8.0	**9.7**	–	**9.7**

Adaptive Management: Burden Transferred from Regional Projects to Newly Identified High-Efficiency Green Street Opportunities

Adaptive Management: Remaining Capacities for Bacteria and Public LID are Offset by Residential LID

Adaptive Management: Regional BMP Located at Subwatershed Outlet

Figure 8-2 EWMP Implementation Plan Scenarios

- **Scenario 1**: The EWMP Implementation Strategy currently identifies 5.92 AF of storage necessary for green streets for this subwateshed. Consider a hypothetical example scenario where a street-scale analysis reveals that an additional 3 AF of high-efficiency green street opportunities exist in the subwatershed, bringing the total green street implementation to 8.92 AF. The Scenario 1 row demonstrates how this additional green street capacity can offset the need for other BMPs in the subwatershed; in this case, regional capacity on private parcels for bacteria compliance. It is important to realize, however, that a 1:1 exchange of BMP capacities between different types of control measures is not appropriate (*e.g.*, in Scenario 1, the green street capacity increases by 3 AF, but regional capacity on public land is reduced by 2.81 AF). Exchange of control measure capacity is not 1:1 because [1] green streets perform differently than regional BMPs, [2] the BMPs treat different land uses, and [3] the BMPs experience different infiltration rates. Adaptive management will therefore require some type of "equivalency" demonstration to maintain reasonable assurance that the revised control measures will achieve the compliance goals on the left-hand side of the table.

- **Scenario 2:** this scenario demonstrates an example where residential LID programs progress at five times the pace assumed in the RAA. In this case, the Group member was able to achieve an adoption rate of 5 percent of residential parcels per year versus the 1 percent assumed by the RAA. The additional residential LID offsets the remaining 1 AF of capacity for bacteria compliance in lieu of constructing regional BMPs on private parcels, and also offsets LID on public parcels. Note the substitution of regional LID requires more total control measure capacity (because regional projects located at the outfall are more efficient for removing pollutants), but the total cost would likely be far lower.

- **Scenario 3**: this scenario considers a situation where – instead of the previous two scenarios – a private parcel is acquired at the outlet of the subwatershed. Assuming redevelopment and residential LID will progress in the subwatershed regardless of other control measures, a regional project could be installed on the private parcel and optimized to satisfy the remaining compliance target runoff volume, eliminating the need for any other remaining BMPs in the subwatershed.

The above scenarios provide only a handful of examples where adaptive management would lead to adjustments of control measure capacities. It is anticipated that, over the course of implementation, agencies will continue to innovate, customize BMP configurations, and strategically locate BMP opportunities that will reduce the overall level of BMP implementation. It will be important to demonstrate equivalency as these adjustments are made to the EWMP Implementation Strategy.

Section 9
EWMP Implementation Costs and Financial Strategy

The purpose of this section is to present costs for constructing, operating and maintaining all control measures in the EWMP Implementation Strategy, along with the financial strategy for addressing those costs. For the purposes of the EWMP, the financial strategy is defined as the strategic options available to the Permittees for financing the program costs associated with the MS4 Permit. The section provides an overview of the following components of the EWMP financial strategy:

- Estimates of costs to construct, operate and maintain required control measures (9.1);
- Assessment of existing stormwater program cost and funding sources (9.2);
- Identification of financial strategies for financing program costs including next steps (9.3).

9.1 EWMP Implementation Costs

The purpose of this section is to present the order-of-magnitude cost estimates for the EWMP Implementation Strategy. The estimated program costs were developed using the methodology described in Section 6.3.3. The general approach for cost estimate is based on "cost functions" that describe cost as a function of BMP size parameters (volume, depth, area, etc.). Details on the cost function methodology is provided in the documentation for the WMMS model (http://dpw.lacounty.gov/wmd/wmms/res.aspx). The cost functions used for this EWMP are presented in Table 9-1, which have been updated from those in the original WMMS[33]. The cost functions are based on generic, modular cost functions developed specifically for Los Angeles County. The cost functions[34] encompass planning, design, permits, construction, operations and maintenance (O&M), and post-construction inspection, where applicable. Cost estimates are applicable only for the modeled BMP configurations specified in Section 6 and Appendix 6D. Note that costs do not account for inflation, interest, or time-value of money.

The costs for structural BMPs are considered to be planning level only (order of magnitude), and can be refined as EWMP implementation progresses with the use of actual BMP implementation costs. Costs for enhanced minimum control measures and other institutional BMPs have not been included because they will vary by jurisdiction and are estimated to be a small percentage of the overall program costs. Monitoring and stormwater program costs are not included.

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[33] The O&M cost estimates were further refined based on interviews with municipal maintenance staff in Southern California (City of San Diego and Tetra Tech, 2011; Caltrans, City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, and Unified Port of San Diego, 2013). Routine maintenance was assumed to occur annually, while intermittent maintenance activities were assume to occur every four years. Replacement costs were not considered under the assumption that systems will be properly maintained and functional throughout and beyond the implementation schedule.

[34] While the cost functions in Section 6 were based on 20-year costs, this section separates the annual O&M costs from the capital costs to allow for cost estimates over time.

Table 9-1 Summary of Annualized Cost Estimation Formulas

BMP Category	BMP Types	Functions For Estimating Total Costs [1]	
		Capital Costs	Annual O&M
LID and Green Streets	Bioretention with Underdrain	*Cost = 17.688 (A) + 2.165 (Vt) + 2.64 (Vm) + 3.3 (Vu)*	*Cost = 2.54 (A)*
	Bioretention without Underdrain	*Cost = 9.438 (A) + 2.165 (Vt) + 2.64 (Vm)*	*Cost = 2.54 (A)*
	Residential LID	*Cost = 4.000 (A)*	--
	Permeable Pavement with Underdrain	*Cost = 33.594 (A) + 3.3 (Vu)*	*Cost = 1.74 (A)*
	Permeable Pavement without Underdrain	*Cost = 25.344 (A)*	*Cost = 1.74 (A)*
Regional BMPs	Pumps[2]	*Cost = 56,227*(Pump Capacity$_{cfs}$) + $1,207,736*	
	Regional Project on Public Parcel	*Cost = 10.01 (A) + 2.296 (Vt) + 2.8 (Vm)*	*Cost = 1.918 (A)*
	Regional Project on Private Parcel[3]	*Cost = 139.01 (A) + 2.296 (Vt) + 2.8 (Vm)*	*Cost = 1.918 (A)*

1 – Formulas describe annualized life cycle costs including routine and intermittent O&M using the following variables: (*A*) is the area of the BMP footprint in square feet, (*Vt*) is the total volume of the BMP in cubic feet, (*Vm*) is the volume of the BMP soil media in cubic feet, and (*Vu*) is the volume of the BMP underdrain in cubic feet.
2 – The resolution of WMMS output precludes the certain estimation of pump station quantity and capacity. Note that incidental costs associated with pump station operation will likely be incurred during implementation.
3 – Includes land acquisition cost estimate.

9.1.1 EWMP Costs by BMP and TMDL Milestones

The total estimated costs for all control measures in the EWMP Implementation Strategy (LID, Green Streets, and Regional) are shown in Table 9-2. The capital and O&M costs are reported for the same milestones detailed in the EWMP Implementation Strategy. The implementation cost schedule relies on initial capital costs to achieve the control measure capacities at the milestone year, and then recurring annual O&M costs are accumulated over the compliance time frame.

Table 9-2 Total Costs by Milestone for each BC EWMP Group member ($ millions) [1]

Agency	Program	Present to 50% Metals TMDL Milestone (2016)		50% Metals TMDL Milestone (2016) to Final Compliance with Metals TMDL (2021)		50% Metals TMDL Milestone (2016) to Final Compliance with Bacteria TMDL (2021)		Total at Final (2021)	
		Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr
Beverly Hills	LID	0.24		3.83		0.00		4.07	
	Streets	1.82		25.17		0.00		26.99	
	Public Regional	3.36		1.66		0.00		5.02	
	Private Regional	0.00		14.71		21.15		35.86	
	Subtotal	**5.43**	**0.64**	**45.37**	**4.59**	**21.15**	**4.87**	**71.95**	**4.87**
Culver City	LID	1.18		2.21		0.00		3.39	
	Streets	5.34		8.14		0.00		13.48	
	Public Regional	1.24		0.05		0.00		1.29	
	Private Regional	13.22		85.63		20.79		119.64	
	Subtotal	**20.98**	**1.12**	**96.02**	**3.52**	**20.79**	**3.79**	**137.80**	**3.79**
Inglewood	LID	0.26		2.11		0.00		2.38	
	Streets	0.34		4.69		0.00		5.03	
	Public Regional	2.28		1.27		0.00		3.55	
	Private Regional	4.93		50.55		0.07		55.55	
	Subtotal	**7.81**	**0.40**	**58.63**	**2.04**	**0.07**	**2.04**	**66.51**	**2.04**
Los Angeles	LID	7.27		53.40		0.00		60.67	
	Streets	32.23		168.79		0.00		201.02	
	Public Regional	46.76		26.44		0.00		73.19	
	Private Regional	13.27		1,586.83		346.85		1,946.95	
	Subtotal	**99.53**	**9.90**	**1,835.46**	**57.94**	**346.85**	**62.50**	**2,281.84**	**62.50**
Santa Monica	LID	0.10		0.34		0.00		0.44	
	Streets	0.30		0.90		0.00		1.20	
	Public Regional	2.31		0.02		0.00		2.33	
	Private Regional	0.00		13.39		0.00		13.39	
	Subtotal	**2.71**	**0.31**	**14.65**	**0.64**	**0.00**	**0.64**	**17.36**	**0.64**
Uninc. LA County	LID	0.80		1.38		0.00		2.18	
	Streets	1.86		3.20		0.00		5.06	
	Public Regional	3.05		0.08		0.00		3.13	
	Private Regional	8.74		58.60		6.23		73.57	
	Subtotal	**14.45**	**0.79**	**63.25**	**2.10**	**6.23**	**2.18**	**83.93**	**2.18**

Table 9-2 Total Costs by Milestone for each BC EWMP Group member ($ millions) [1]

Agency	Program	Present to 50% Metals TMDL Milestone (2016)		50% Metals TMDL Milestone (2016) to Final Compliance with Metals TMDL (2021)		50% Metals TMDL Milestone (2016) to Final Compliance with Bacteria TMDL (2021)		Total at Final (2021)	
		Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr
West Hollywood	LID	0.16		1.39		0.00		1.55	
	Streets	0.42		3.26		0.00		3.68	
	Public Regional	2.33		0.59		0.00		2.92	
	Private Regional	0.00		44.92		11.18		56.11	
	Subtotal	**2.91**	**0.34**	**50.17**	**1.57**	**11.18**	**1.72**	**64.26**	**1.72**
Total		**153.82**	**13.50**	**2,163.55**	**72.40**	**406.28**	**77.74**	**2,723.65**	**77.74**

1 O&M costs for each milestone includes cost from previous milestone (i.e. the costs are cumulative)

9.1.2 EWMP Costs by Watershed

The EWMP costs are presented for each watershed in Table 9-3.

Table 9-3 Total Costs for each Assessment Area / Watershed in the BC EWMP Area ($ millions)

Agency	Ballona at the Mouth		Centinela Creek		Sepulveda Channel		Total	
	Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr
Beverly Hills	71.95	4.87	0.00	0.00	0.00	0.00	71.95	4.87
Culver City	87.02	2.61	44.63	1.01	6.15	0.17	137.80	3.79
Inglewood	15.55	0.26	50.96	1.78	0.00	0.00	66.51	2.04
Los Angeles	1,872.40	48.48	83.86	2.51	325.58	11.50	2,281.84	62.50
Santa Monica	0.00	0.00	0.00	0.00	17.36	0.64	17.36	0.64
Uninc. LA County	35.37	0.78	48.56	1.41	0.00	0.00	83.93	2.18
West Hollywood	64.26	1.72	0.00	0.00	0.00	0.00	64.26	1.72
Total	**2,146.55**	**58.72**	**228.01**	**6.70**	**349.08**	**12.32**	**2,723.65**	**77.74**

9.1.3 Unit Costs by Parcel

In determining the cost to each Group member it is possible to conduct a high-level calculation of dividing the capital costs by the number of parcels within each jurisdiction. Since stormwater impacts all parcels within the watershed, all parcels will be liable for the costs. Shown in Table 9-4, are the preliminary costs by parcel for each jurisdiction. Parcels vary in size dramatically throughout the cities and the county, and ultimately costs will likely be developed relevant to parcel size, parcel imperviousness, and possibly other factors to best represent the nexus between stormwater pollutant loading and any estimated cost liability for each parcel.

Table 9-4 Existing City-Wide Stormwater Costs

Jurisdiction	Existing Utility?	Funding Source	Description of Costs	Total Costs
Beverly Hills	Yes	Stormwater Fund/General Fund	Management, Outreach, Inspections, O&M and Capital	~$4M/yr (excluding CIP)
Culver City	No	General Fund	Management, MCMs, TMDLs	~$500,000/yr
Inglewood	Yes	Sewer Fund	O&M and Capital, Runoff Investigation	$2.2M/yr
Los Angeles	Yes	Stormwater Fund	O&M and Capital, Planning, Enforcement and Monitoring	~$30M/yr
Santa Monica	Yes	Stormwater Fund/General Fund	O&M and Capital, Outreach, Inspections, Management	~$13.7M/yr
Unincorporated LA County	Yes	General Fund	Management, Outreach, inspection, enforcement, monitoring	~80M/yr (County wide)
West Hollywood	No	General Fund	Management, Outreach, Inspections	~$1M/yr

9.2 Existing Stormwater Programs

Each jurisdiction in the BC EWMP area has existing recurring costs associated with stormwater activities. Table 9-4 is a summary listing of existing costs and associated revenue source based on the results of a survey of EWMP Group members. It is assumed that the recurring costs will continue, and costs to implement the EWMP will be in addition to those costs. The Financial Strategy is focused on developing a set of options to address the expected *additional* costs, and does not address funding requirements for *existing* stormwater programs.

9.3 Financial Strategies

The financial strategy to fund the LID, green streets and regional projects in the EWMP will require local and regional strategies. The capital and operating costs for those control measures are large and will span decades. It will be important for each jurisdiction to have the opportunity to customize the financial strategy to the preferences of its community. As such, the financial strategy presented in this EWMP outlines a set of multiple approaches that allows each jurisdiction to consider and select those strategies that best fit their specific preferences. The detailed financial strategy for EWMP costs will be highly dependent and vary by Permittee.

The following are high-level alternatives that can be examined for each jurisdiction or the entire EWMP Group. The alternatives are categorized by type. Acknowledgement is given to *Stormwater Funding Options – Providing Sustainable Water Quality Funding in Los Angeles County,* a report authored by Ken Farfsing and Richard Watson dated May 21, 2014.

9.3.1 Grants

The financial strategies available to the Permittees associated with grants are:

Description
Apply for grants through the recently passed Prop 1 – 2014 Water Bond. Over $400M is available for stormwater capture, IRWMP and urban creek restoration projects.
Apply for other grants (state and federal) for stormwater improvement, beach water quality improvement, and green infrastructure projects. (*e.g.*, Prop. 84, CBI, etc.)

9.3.2 Fees and Charges

The financial strategies available to the Permittees associated with fees and charges are:

Description
Use existing revenue streams for stormwater/water supply/flood control projects to support stormwater quality projects
AB 2403 – Use the new state law to pass rate increase for stormwater projects that have a water-supply benefit and minimize the Proposition 218 process.
Use revenue generated from a Stormwater Impact Fee (or "In-Lieu" Fee) to comply with LID ordinances to fund a mitigation bank for regional projects.
Increase solid waste management fees to cover the cost of enhanced street sweeping and other measures to reduce trash for compliance with TMDLs.
Consider adopting water conservation fees that would provide funding for reducing irrigated runoff in order to both conserve water and reduce dry weather pollution.
Continue to pursue a county-wide stormwater parcel tax initiative (modified after the 2012 Clean Water Clean Beaches Initiative). This could be tied to AB 2403 too.
Consider assessments on car rentals since some of the pollution in our waterways is from rental cars driven on local streets.

9.3.3 Legislative and Policy

The financial strategies available to the Permittees that require legislative or policy changes are summarized below:

Description
Develop stormwater retention credit trading market to use private equity.
Ask the Metropolitan Water District (MWD) of Southern California to reevaluate their approach for managing the Local Resource Program (LRP) to fund stormwater capture and use projects that offset the use of imported water supplies.
Pursue pollutant source control legislation patterned after SB 346 that either limits pollutants of concerns in products (*e.g.*, copper in brake pads, or zinc in tires) or assesses a fee on those products that can be used by local governments to mitigate those pollutants.
Form Special Assessment Districts and fees tailored to the BC EWMP Group members.
Explore the use of Enhanced Infrastructure Finance Districts tailored to the BC EWMP Group members, as outlined in recently adopted (2014) California legislation SB628.
2014 Water Resources Reform and Development Act of 2014 (WRRDA). Various funding opportunities should be explored.

9.3.4 Future Steps

The financial strategies mentioned herein are options for funding sources, some or all of which will need to be implemented to develop a comprehensive financial solution. As each jurisdiction determines the appropriate funding source, they could consider the following items as well:

- Develop public support for financial strategies though outreach efforts; and

- Creation of an inter-jurisdictional BC EWMP Group Financial Subcommittee to develop a more formal Stormwater Program Financial Plan which would typically include the following components:
  - Implementation of New Fee or Charge.
  - Establishment of New Enterprise Fund.
  - Cash and Debt Financing.
  - Operating and Capital Reserves.
  - Cash Flow Modeling.

The BC EWMP Group as a whole, as well as individual Group members, is currently prioritizing and selecting the specific financing strategies that best fit its members'needs.

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Section 10
References

Bay Area Stormwater Management Agencies Association (BASMAA). 2011. 2010-11 Annual Reports for the Municipal Regional Stormwater NPDES Permit, Pollutants of Concern and Monitoring, A7-A12 Brake Pad Copper Reduction.

Breault, R.F., Smith, K.P., Sorenson, J.R. 2005. Residential Street-Dirt Accumulation Rates and Chemical Composition, and Removal Efficiencies by Mechanical-and Vacuum-Type Sweepers, New Bedford, Massachusetts, 2003–04. USGS Scientific Investigations Report 2005-5184.

California Department of Transportation (Caltrans). 2000. District 7 Litter Management Pilot Study, URSGWC Project No. 58-977001NJ.01-FR400, June 26, 2000.

California Stormwater Quality Association (CASQA). 2010. Fact Sheet on SB 346 and Copper Compliance for Stormwater Permittees.

CASQA. 2007. Municipal Stormwater Program Effectiveness Assessment Guidance. May 2007.

County of Los Angeles. 2010. Multi-Pollutant TMDL Implementation Plan for the Unincorporated County Area of Ballona Creek. Submitted to California Regional Water Quality Control Board – Los Angeles Region. 7 October 2010.

Clean Rivers Through Stakeholder-led TMDLs Consulting Team. 2010. Los Angeles River Watershed Bacteria TMDL – Technical Report Section 3: Numeric Targets. Prepared for CREST (Cleaner Rivers through Effective Stakeholder-Led TMDLs

CREST (2008). Cleaner Rivers through Effective Stakeholder-led TMDLs. Los Angeles River Bacteria Source Identification Study: Final Report. Report can be found at http://www.crestmdl.org/reports/index.html., November 2008.

Donigian, A.S., and J.T. Love, 2003. Sediment Calibration Procedures and Guidelines for Watershed Modeling. Aqua Terra Consultants, Mountain View, California.

Donigian, A.S., Jr. 2000. HSPF Training Workshop Handbook and CD. Lecture #19: Calibration and Verification Issues. Prepared for and presented to the U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Washington, DC.

Donigian, A.S., Jr., J.C. Imhoff, B.R. Bicknell, and J.L. Kittle, Jr. 1984. Application Guide for Hydrological Simulation Program – FORTRAN (HSPF). EPA-600 / 3-84-965. U.S. Environmental Protection Agency, Environmental Research Laboratory, Athens, GA.

California Department of Water Resources, State Water Resources Control Board, California Bay-Delta Authority, California Energy Commission, California Department of Public Health, California Public Utilities Commission, California Air Resources Board. 20x2020 Water Conservation Plan. February 2010.

City of Beverly Hills, CalTrans, City of Culver City, City of Los Angeles, City of Inglewood, City of Santa Monica, and City of West Hollywood. Total Maximum Daily Load for Toxic Pollutants in Ballona Creek Estuary Implementation Plan. June 2012.

City of Beverly Hills, CalTrans, City of Culver City, City of Los Angeles, City of Inglewood, City of Santa Monica, and City of West Hollywood. Total Maximum Daily Load for Metals in Ballona Creek, Implementation Plan (Draft). January 2010.

City of Beverly Hills, CalTrans, City of Culver City, City of Los Angeles, City of Inglewood, City of Santa Monica, and City of West Hollywood. Total Maximum Daily Load for Bacterial Indicator Densities in Ballona Creek, Ballona Estuary, and Sepulveda Channel Implementation Plan (Draft). November 2009.

Lumb, A.M., R.B. McCammon, and J.L. Kittle, Jr. 1994. User's Manual for an Expert System (HSPEXP) for Calibration of the Hydrological Simulation Program – FORTRAN. Water-Resources Investigation Report 94-4168. U.S. Geological Survey, Reston, VA.

Mayer, P., W. DeOreo, M. Mayden, R. Davis, E. Caldwell, T. Miller, P.J. Bickel. 2009. Evaluation of California Weather-Based "SMART" Irrigation Controller Programs.

Pitt, R.E., Williamson, D., Voorhees, J., and Clark, S., 2004, Review of historical street dust and dirt accumulation and washoff data in James, W., Irvine, K.N., McBean, E.A., and Pitt, R.E., eds., Effective modeling of urban water systems: Niagara Falls, NY, Computational Hydraulics Institute, p43.

Regional Board. 2002. Amendment to the Water Quality Control Plan for the Los Angeles Region to Incorporate Implementation Provisions for the Region's Bacteria Objectives and to Incorporate a Wet-Weather Total Maximum Daily Load for Bacteria at Santa Monica Bay Beaches. Resolution No. 2003-10. December 12, 2002.

Sartor, J.D., and Gaboury, D.R. 1984. Street sweeping as a pollution control measure—Lessons learned over the past ten years: Science of the Total Environment, v. 33, p. 171–183.

Shen, J., A. Parker, and J. Riverson. 2004. A New Approach for a Windows-based Watershed Modeling System Based on a Database-supporting Architecture. Environmental Modeling and Software, July 2004.

Storm Water Managers Resource Center (SMRC). Pollution Prevention Fact Sheet: Parking Lot and Street Cleaning. (No Date, found here: http://www.stormwatercenter.net/).

Tetra Tech. 2010a. Los Angeles County Watershed Model Configuration and Calibration—Part I: Hydrology. Prepared for County of Los Angeles Department of Public Works, Watershed Management Division, Los Angeles County, CA, by Tetra Tech, Pasadena, CA.

Tetra Tech. 2010b. Los Angeles County Watershed Model Configuration and Calibration—Part II: Water Quality. Prepared for County of Los Angeles Department of Public Works, Watershed Management Division, Los Angeles County, California, by Tetra Tech, Pasadena, California.

Tetra Tech. 2011. Evaluation of Water Quality Design Storms. Prepared for County of Los Angeles Department of Public Works, Watershed Management Division, Los Angeles County, CA, by Tetra Tech, Pasadena, California.

Tetra Tech and USEPA (U.S. Environmental Protection Agency). 2002. The Loading Simulation Program in C++ (LSPC) Watershed Modeling System – User's Manual. Tetra Tech, Fairfax, Virginia, and U.S. Environmental Protection Agency, Washington, DC.

University of Florida. (2012). Mercury Spills. Available at: http://www.ehs.ufl.edu/programs/ih/mercury/

USEPA (U.S. Environmental Protection Agency). 2009. SUSTAIN—A Framework for Placement of Best Management Practices in Urban Watersheds to Protect Water Quality. EPA/600/R-09/095. U.S. Environmental Protection Agency, Office of Research and Development, Edison, NJ.

USEPA (U.S. Environmental Protection Agency). 2003. Fact Sheet: Loading Simulation Program in C++. USEPA, Watershed and Water Quality Modeling Technical Support Center, Athens, Georgia. Available at: http://www.epa.gov/athens/wwqtsc/LSPC.pdf.

USEPA. 2000. Stormwater Phase II Final Rule, Construction Site Runoff Control Minimum Control Measure Fact Sheet. EPA 833-F-00-008. January 2000 (revised December 2005).

USEPA. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices, EPA-821-R-99-012, August 1999 (Chapter 5).

Water Environment Research Federation and American Society of Civil Engineers (WERF and ASCE). 2012. International Stormwater Best Management Practices (BMP) Database, Narrative Overview of BMP Database Study Characteristics. Prepared by Wright Water Engineers, Inc. and Geosyntec Consultants.

Wisconsin Department of Natural Resources (DNR). (2002). Problems Associated with bis(2-ethylhexyl)phthalate Detections in Groundwater Monitoring Wells. Publication WA 1011. Rev. 2002. Available at: http://dnr.wi.gov/files/pdf/pubs/wa/wa1011.pdf

Zou, R., Liu, Y., Riverson, J., Parker, A. and S. Carter. 2010. A nonlinearity interval mapping scheme for efficient waste load allocation simulation-optimization analysis. Water Resources Research, August 2010.