County of San Diego

SARAH E. AGHASSI
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December 17, 2014

Mr. David W. Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

COUNTY OF SAN DIEGO, PERMIT R9-2013-0001, PIN 255223 – INTERIM DELIVERABLE IN RESPONSE TO PROVISION B.3 WATER QUALITY IMPROVEMENT GOALS, STRATEGIES AND SCHEDULES FOR THE WATER QUALITY IMPROVEMENT PLAN FOR THE SAN DIEGO RIVER WATERSHED MANAGEMENT AREA

Dear Mr. Gibson:

On behalf of the Participating Agencies (PAs) in the San Diego River Watershed Management Area, the County of San Diego is pleased to submit the attached document in accordance with requirements set forth in Provision F.1.a. (3)(c) of Order R9-2013-0001, the National Pollution Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, NPDES No. CAS0109266 (Permit).

In order to facilitate regulatory review, a "crosswalk" table is provided following the Executive Summary to indicate where specific permit provisions are addressed in the document. Section 3 follows the framework of Permit Provision B.3, Water Quality Improvement Goals, Strategies, and Schedules:

- Section 3.1. Introduction
- Section 3.2. Water Quality Improvement Goals and Schedules
- Section 3.3. Water Quality Improvement Strategies
- Section 3.4. Permit Compliance
- Section 3.5 Optional Watershed Management Area Analysis
- Section 3.6 References

We want to thank your staff for their willingness to provide feedback and we look forward to continued interaction with your staff on developing the Water Quality Improvement Plan for the San Diego River Watershed Management Area.

If you have any questions or comments, please contact LUEG Program Manager, Todd Snyder at (858) 694-3672 or Todd.Snyder@sdcounty.ca.gov, or Jo Ann Weber at (858) 495-5317 or JoAnn.Weber@sdcounty.ca.gov.

Sincerely,

SARAH E. AGHASSI, Deputy Chief Administrative Officer
Land Use and Environment Group

Attachments: San Diego River Water Quality Improvement Plan Provision B.3

Cc: Jaime Campos, City of El Cajon Permit No. R9-2013-0001: PIN 222391
Joe Kuhn, City of La Mesa Permit No. R9-2013-0001: PIN 235927
Clement Brown, City of San Diego Permit No. R9-2013-0001: PIN 255222
Cecilia Tipton, City of Santee Permit No. R9-2013-0001: PIN 255749
Roya Yazdanifard, California Department of Transportation Permit No. R9-2013-0001: PIN 212814

San Diego River Watershed Management Area, Water Quality Improvement Plan
Provision B.3 Chapter

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."

Signature _____ Date 12/3/14

Douglas Williford, City Manager — (619) 441-1780
Printed Name, Title — Phone Number

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CITY OF
LA MESA
JEWEL of the HILLS

PUBLIC WORKS DEPARTMENT

December 3, 2014

SAN DIEGO RIVER WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 CHAPTER, STATEMENT OF 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.

Name

12/11/14
Date

8130 ALLISON AVENUE • LA MESA, CA 91942 • TEL: 619.667.1166 FAX: 619.667.1380

THE CITY OF SAN DIEGO

STATEMENT OF CERTIFICATION

DRAFT SAN DIEGO RIVER WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN – INTRODUCTION, PROVISION B.2 CHAPTER AND PROVISION B.3 CHAPTER

I certify, under penalty of law, that this Water Quality Improvement Plan submittal 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 known violations.

12/11/14

DREW KLEIS
Deputy Director
Transportation & Storm Water Department

Date

Transportation & Storm Water Department
9370 Chesapeake Drive, Suite 100, MS 1900 • San Diego, CA 92123
Hotline (619) 235-1000 Fax (858) 541-4350

CITY OF SANTEE

SAN DIEGO RIVER WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 CHAPTER, STATEMENT OF 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.

Pedro Orso-Delgado
PRINT NAME

Acting City Manager
TITLE

SIGNATURE

11/26/14
DATE

SARAH E. AGHASSI
DEPUTY CHIEF ADMINISTRATIVE OFFICER

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SAN DIEGO RIVER WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 CHAPTER, STATEMENT OF 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.

Sarah Aghassi

SARAH E. AGHASSI
Deputy Chief Administrative Officer
Land Use and Environment Group
County of San Diego

12/17/14
Date

DEPARTMENT OF TRANSPORTATION
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4050 TAYLOR STREET, M.S. 242
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Serious drought.
Help save water!

December 2, 2014

STATEMENT OF CERTIFICATION

SAN DIEGO RIVER WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 CHAPTER, STATEMENT OF 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.

Bruce L. April

BRUCE L. APRIL
Deputy District Director, Environmental

12/4/14
Date

Enclosure

SAN DIEGO RIVER WATERSHED MANAGEMENT AREA WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 CHAPTER

Submitted by

City of El Cajon
City of La Mesa
City of San Diego
City of Santee
County of San Diego
Caltrans

Prepared by

Geosyntec consultants

LARRY WALKER ASSOCIATES

December 17, 2014

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ACRONYMS

AEF	Allowed Exceedance Frequencies
CPI	Catchment Prioritization Index
EMC	Event Mean Concentrations
FC	Fecal Coliform
HMP	Hydromodification Management Plan
HPWQC	Highest Priority Water Quality Condition
IDDE	Illicit Discharge Detection and Elimination
JRMP	Jurisdictional Runoff Management Programs
LID	Low Impact Development
LSPC	Loading Simulation Program in C++
PWQC	Priority Water Quality Conditions
ROW	Rights of Ways
ROWD	Report Of Waste Discharge
SBPAT	Structural BMP Prioritization Analysis Tool
SCCWRP	Southern California Coastal Water Research Project
SDR	San Diego River
SSF	Subsurface Flow
SUSMP	Standard Urban Storm water Management Plan
SUSTAIN	System for Urban Stormwater Treatment and Analysis INtegration
SWRCB	State Water Resources Control Board
TLR	Target Load Reductions
TMDL	Total Maximum Daily Load
UTC	Urban Tree Canopy
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan

EXECUTIVE SUMMARY

WATER QUALITY IMPROVEMENT GOALS, STRATEGIES, AND SCHEDULES (SECTION 3)

The SDR Participating Agencies must develop specific water quality improvement goals and strategies to address the water quality conditions identified for the San Diego River Watershed (SDR), as defined in the Provision B.2 Chapter of the Water Quality Improvement Plan (WQIP).

The goals include interim and final numeric (i.e., quantifiable) goals for the highest priority water quality condition (HPWQC), fecal indicator bacteria (bacteria), for wet weather and dry weather in the San Diego River Watershed. The Bacteria TMDL requires Participating Agencies to reduce bacteria levels during both dry weather and wet weather conditions within a 10- and 20-year compliance timeline, respectively. The goals within the WQIP were selected to demonstrate progress towards compliance with the Bacteria TMDL, and the strategies are the actions to be taken to obtain compliance. Multi-benefit strategies have been prioritized to achieve goals for bacteria as well as other pollutants, and will thereby address both the HPWQC and other priority water quality conditions (PWQCs) in the San Diego River Watershed. The approach to achieving WQIP goals, and the corresponding WQIP section, is shown in **Figure ES-1.**

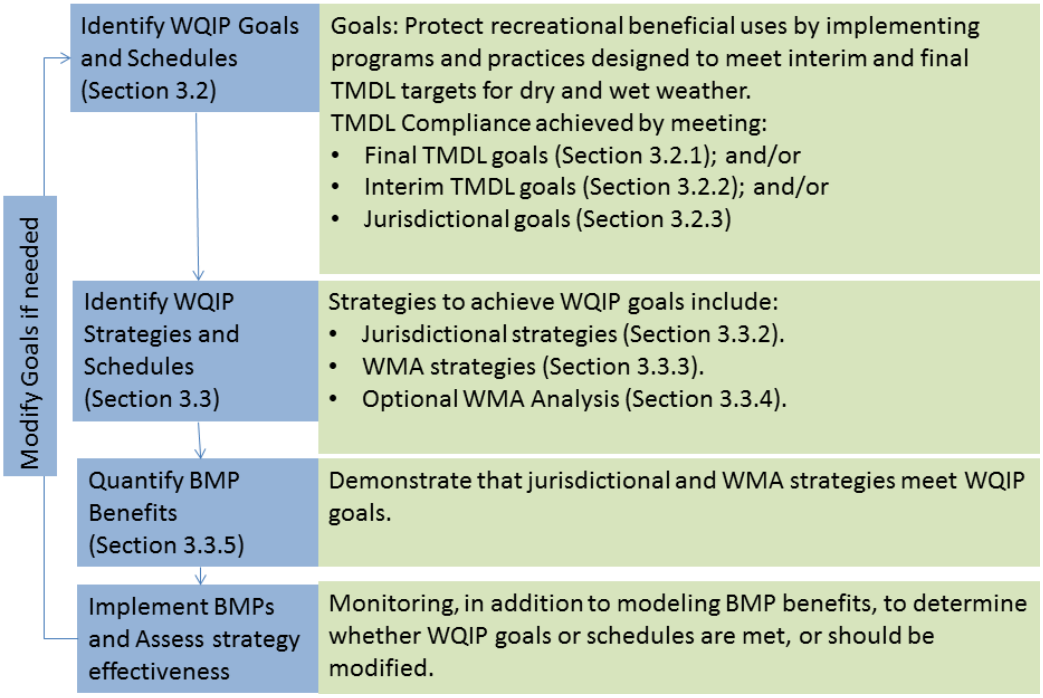

Figure ES-1. Approach for Achieving WQIP Goals

WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES (SECTION 3.2)

The jurisdictional interim and final goals are based on the compliance options for the Bacteria TMDL from Attachment E of the Permit. The goals are presented for dry and wet weather conditions as follows:

- Interim goals include:
  - Jurisdictional specific goals based on Current Permit terms (through 2018)
  - Jurisdictional specific goals for each 5 year Permit Term following WQIP acceptance based on the Bacteria TMDL schedules to demonstrate progress toward meeting the final goals.
- Final goals include compliance options based on final TMDL compliance requirements.

Since the permit allows multiple pathways to be followed to achieve compliance (i.e. demonstration of progress toward all compliance pathways is not required), the numeric goals are independent of each other. The timelines and relationships between the goals are shown in **Figure ES-2.**

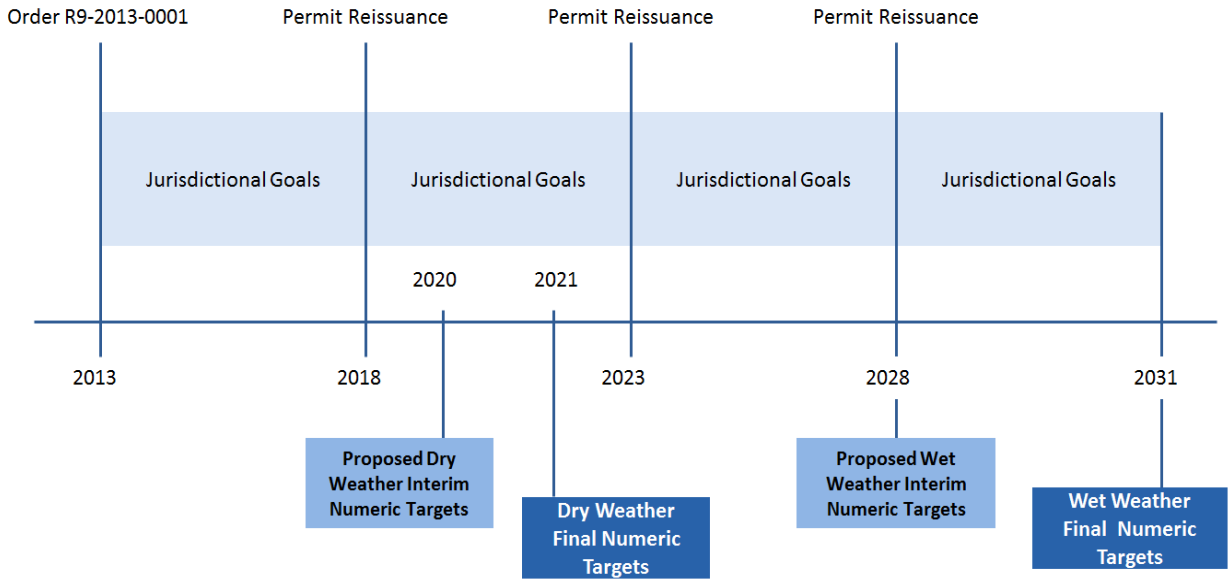

Figure ES-2. Timelines and Relationships Between Bacteria TMDL Numeric Targets[1]

[1]Per the Permit, Participating Agencies may propose alternative TMDL interim milestones which differ from those presented in above in Figure 3.

WATER QUALITY IMPROVEMENT STRATEGIES (SECTION 3.3)

Each jurisdiction has developed its own strategies that will be implemented to work toward its goals. The Participating Agencies also developed optional jurisdictional and watershed strategies that, if needed, would be implemented through coordination amongst the Participating Agencies. The strategies are generally broad in nature and include suites of programmatic (a.k.a. non-structural) and structural BMPs that are expected to improve conditions within the watershed. The

Strategies were selected for consideration using the following criteria:

- BMP effectiveness, particularly for bacteria reduction, with consideration for the priority water quality conditions;
- Provision of multiple benefits, including but not limited to habitat, recreation, economic, and water resources benefits; and
- The degree to which the strategy is sustainable, implementable, and cost-effective.

In order to assess the ability of the proposed strategies to achieve WQIP numeric goals, load reductions expected to result from the implementation of these strategies were estimated for dry and wet weather.

PERMIT COMPLIANCE (SECTION 3.4)

To provide a reasonable assurance, quantitative wet weather load reduction modeling was performed for the structural BMPs to demonstrate that the load reduction target for the SDR watershed management area can be achieved through implementation of this WQIP. The predicted wet weather load reduction is greater than the estimated target load reduction, indicating that WQIP implementation is expected to meet the HPWQC final numeric goal. For dry weather, an analytical spreadsheet approach was used to demonstrate reasonable assurance that compliance will be reached through implementation of this WQIP. Per the requirements of Attachment E in the Permit, the structural BMPs proposed in the CLRP were included in this plan.

OPTIONAL WATERSHED MANAGEMENT AREA ANALYSIS (SECTION 3.5)

The Permit provides an innovative pathway for Participating Agencies to provide offsite alternative compliance options to their land development programs by performing watershed-specific analyses characterizing each watershed. The Watershed Management Area Analysis (WMAA), as denoted in the Permit, is an optional task intended to characterize important processes and characteristics of each watershed through creation of GIS layers that may be used for the following purposes:

1) To identify candidate projects that could potentially be used as offsite alternative compliance options in lieu of satisfying full onsite retention, biofiltration, and hydromodification runoff requirements.
2) To identify and/or prioritize areas where it is appropriate to allow certain exemptions from onsite hydromodification management BMPs.

Understanding that development of a WMAA is on a watershed-by-watershed basis could be time and funding intensive, the Participating Agencies elected to perform the watershed characterization and hydromodification management exemption mapping on a regional scale under a separate but concurrent effort to development of the WQIPs, and presented it in Appendix F.

DOCUMENT CROSSWALK

As part of the WQIP Development, the Participating Agencies have collaboratively crafted this document "crosswalk" to provide permit provision references to the corresponding WQIP document section, including the WQIP page number reference. This crosswalk is intended to ease the review process.

Permit Provision		Corresponding WQIP Document Section		Page No.
B.3	Water Quality Improvement Goals, Strategies and Schedules	3.	Water Quality Improvement Goals, Strategies and Schedules	1
B.3.a	Water Quality Improvement Goals and Schedules	3.2	Water Quality Improvement Goals and Schedules	5
B.3.a.(1)	Numeric Goals	3.2.2 3.2.3	Jurisdictional Interim Goals Jurisdictional Final Goals	7 8
B.3.a.(2)	Schedules for Achieving Numeric Goals	3.2.4	Schedule for Compliance with Interim and Final Goals	10
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B.3.b.(1)	Jurisdictional Strategies	3.3.3	Jurisdictional Strategies	13
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3 WATER QUALITY IMPROVEMENT GOALS, STRATEGIES, AND SCHEDULES

3.1 INTRODUCTION

Provision B.3 of Order R9-2013-0001 (Permit), "Water Quality Improvement Goals, Strategies and Schedules," describes the requirements to develop specific water quality improvement goals and strategies to address the water quality conditions identified for the San Diego River (SDR) Watershed. These goals and strategies must effectively prohibit non-stormwater discharges to the stormwater conveyance system, reduce pollutants in stormwater discharges from the stormwater conveyance system to the maximum extent practicable, and protect water quality in receiving waters.

WQIP **Goals** are set to measure progress towards addressing the highest priority water quality condition (bacteria) to protect recreational uses.

WQIP **Strategies** are the existing or planned activities or projects that can be implemented to demonstrate reasonable progress towards achieving the goals.

Provision B.3 defines the goals of the Water Quality Improvement Plan (WQIP) and the strategies and schedules for achieving those goals. The goals include interim and final numeric (i.e., quantifiable) goals for the highest priority water quality condition (HPWQC), fecal indicator bacteria (bacteria), for wet weather and dry weather in the lower watershed.

Wet Weather is defined as >0.2" of rain within a 24 hour period and the following 72 hours.

Dry Weather is defined as all other days where rainfall is <0.2" within a given 24 hour period.

Bacteria are important indicators for recreational beneficial uses. Fecal indicator bacteria do not cause illness directly, but some epidemiologic studies[1] have shown correlations between the presence of indicator bacteria and gastrointestinal illness caused by pathogens. Indicator bacteria are used as detection surrogates or proxies for pathogens because they are easier and less costly to measure. Allowable bacteria loads for the San Diego River Watershed are defined by the Bacteria Total Maximum Daily Load (TMDL), identified in Attachment E of the Permit. The purpose of the Bacteria TMDL is to protect the health of those who recreate in waterbodies receiving runoff from the San Diego River Watershed by reducing the amount of bacteria discharged to the waterbodies through urban runoff, stormwater, and other sources.

[1] For example: EPA/600/R-10/168: "Report on the 2009 National Epidemiologic and Environmental Assessment of Recreational Water Epidemiology Studies (NEEAR): Boquerón Beach, Puerto Rico, and Surfside Beach, SC of the paper published in Environmental Health" (PDF, 449pp., 16.78 MB)

The control of bacteria presents unique challenges, since they are ubiquitous in the environment, are living organisms and the amount of bacteria from regrowth[2] as well as natural sources can be significant. Anthropogenic sources and natural sources contribute to bacteria within the watershed. To better understand the contribution from natural sources of bacteria, the San Diego Municipal Copermittees are currently carrying out a San Diego Bacteria Reference Study. The objective of this study is to collect necessary data to account for the natural sources of bacteria in a watershed that are beyond the control of the Copermittees.

Anthropogenic sources of fecal indicator bacteria are caused or produced by humans and include, but are not limited to, failing septic systems, illegal sewage disposal, and pet waste.

Natural sources of fecal indicator bacteria include, but are not limited to, bird and wildlife feces, re-suspension from sediment, and regrowth.

The Bacteria TMDL requires Participating Agencies to attain required load reductions during both dry weather and wet weather conditions within a 10- and 20-year compliance timeline, respectively. The goals within the WQIP are focused to demonstrate progress towards compliance with the Bacteria TMDL and the strategies are the actions to be taken to obtain compliance.

Multi-benefit strategies have been prioritized to achieve goals for bacteria as well as other pollutants, and will thereby address both the highest priority and other priority water quality conditions (PWQCs) in the San Diego River Watershed. PWQC were identified according to the process described in Section 2.3 of the WQIP and typically include conditions where water quality analyses has identified and confirmed that the constituent or condition is not meeting water quality standards and the stormwater conveyance system is a likely contributor to the condition. The PWQCs were identified in Provision B.2 of the WQIP and are presented in Table 1.

Table 1. Priority Water Quality Conditions in San Diego River Watershed Management Area

	Dry Weather	Wet Weather
Highest Priority Water Quality Condition	• Bacteria	• Bacteria
Priority Water Quality Condition	• Nitrogen and Phosphorus • Total Dissolved Solids • Eutrophic Conditions • Index of Biological Integrity	• None

[2] Colford Jr., J. M., T. J. Wade, K. C. Schiff, C. C. Wright, J. F. Griffith, S. K. Sandhu, S. Burns, M. Sobsey, G. Lovelace, and S. B. Weisberg. 2007. "Water Quality Indicators and the Risk of Illness at Beaches With Nonpoint Sources of Fecal Contamination." Epidemiology, 18(1): 27-35, January 2007.

An iterative, adaptive management approach will be used that will improve water quality and increase the effectiveness of strategies will be used to achieve the numeric goals for bacteria. The approach, with corresponding WQIP Provision B.3 sections noted, is presented in Figure 1, and will be discussed further in Provision B.5.

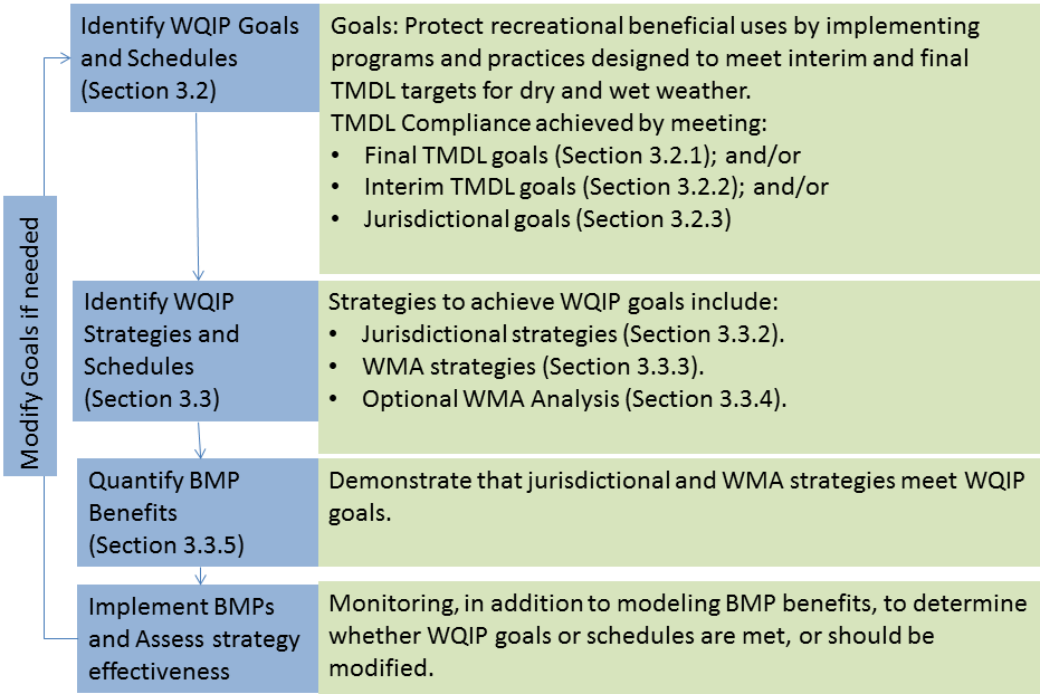

Figure 1. Approach for Achieving WQIP Goals

3.1.1 *Water Quality Improvement Plan Development Process*

The WQIP is being developed in three phases. The first phase of WQIP development identified the priority water quality conditions and potential water quality improvement strategies and was summarized in the first WQIP submittal. The process for development and implementation of the WQIP is outlined by the diagram below. This chapter addresses the "Develop Goals" and "Develop Strategies" steps of the diagram. This chapter also summarizes the second phase of WQIP development and includes:

- Identification of the numeric goals for bacteria in the watershed;
- Strategies that will be implemented to achieve the numeric goals;
- Development of the optional watershed management area analysis; and

Figure 2. WQIP Development and Implementation Process

- Public participation and involvement.

The third phase of the Water Quality Improvement Plan will include a monitoring and assessment program (Provision B.4) to provide feedback to program managers, and an adaptive management process (Provision B.5) to facilitate modifications to the strategies and schedules to meet the goals as new information becomes available.

3.1.2 *PUBLIC PARTICIPATION*

As required by the Permit, the San Diego River Participating Agencies are implementing a public participation process to solicit data, information, and recommendations for the development of the WQIP. On September 23, 2013, the San Diego River Participating Agencies issued a public call for data and information, announced future public workshops, and advertised a schedule of the opportunities for the public to participate and provide comments during the various stages of the WQIP development process. The public workshops were held on October 3, 2013 and on June 26, 2014 at the County of San Diego Chambers. Public comments, received at workshops and submitted online, were considered during development of the WQIP. Comments during the public workshop focused on controlling anthropogenic sources of bacteria, education and outreach to address pet waste, and reducing pollutant impacts. Responses to public comments will be provided prior to the finalization of the WQIP in June 2015.

The San Diego River Participating Agencies formed a WQIP Consultation Panel (Panel) to provide recommendations during the development of the WQIP. The Panel consists of representatives from the Regional Water Board, the environmental community, the development community, and an additional member from the industrial community. The Panel includes the following individuals:

- Christina Arias (Regional Water Board)
- Jim Peugh, primary; Joe Thompson, alternate (Environmental Community)
- Brendan Hastie, primary; Mike McSweeney, alternate (Development Community)
- Nancy Gardiner, Industrial Environmental Association (At-large Seat)

The first Panel meeting was held on January 29, 2014 at the City of San Diego Public Utilities Auditorium to discuss Provision B.2, *Priority Water Quality Conditions*. The second Panel meeting was held at the County of San Diego on August 20, 2014 to discuss Provision B.3, Goals, *Strategies and Schedules*. A third Panel meeting was held on October 29, 2014 at the County of San Diego to discuss draft goals. The San Diego River Participating Agencies coordinated the schedules for the public participation process among the San Diego County Watershed Management Areas to provide the public time and opportunity to participate during the development of the WQIPs. Feedback received at the workshops, via online submission, and at panel meetings was considered during the development of goals, strategies and schedules. In response to the Consultation Panel's comment on the draft Provision B.3 document, the goals were streamlined and the text expanded to provide a comprehensive explanation of the anticipated outcomes and how the outcomes would be measured. Additionally, a strategy section was added to improve the linkage between the actions and the anticipated outcomes.

3.2 WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

The purpose of establishing goals is to "support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality condition" [B.3.a.(1)]. The permit requires that goals be reflective of criteria or indictors to measure incremental progress towards addressing the highest priority water quality condition [HPWQC] over the course of implementation of the WQIP.

As described in Chapter 2 of this WQIP, bacteria is the HPWQC for dry and wet weather in the San Diego River watershed. The goals of the WQIP are focused to achieve compliance with the Bacteria TMDL from Attachment E of the Permit, which presents different options or pathways to achieve compliance. The goals are presented for dry and wet weather conditions as follows:

- Interim jurisdictional goals based on 5-year Permit terms.
- Interim goals based on the interim Bacteria TMDL compliance pathways.
- Final goals based on final Bacteria TMDL compliance options.

The latter two types of goals are already established in Attachment E of the Permit, and are herein referred to as "required goals". These goals are presented in this WQIP to reflect the multiple pathways outlined in the Permit for compliance with the TMDL. Each compliance pathway would result in water quality improvements, but each demonstrates the improvements in a different way. Since the permit allows any of these pathways to be followed to achieve compliance (i.e. demonstration of progress toward all compliance pathways is not required), the compliance pathways are independent of each other.

The compliance pathways are based on three types of metrics:

- receiving water conditions that are evaluated by comparing measured conditions with water quality objectives (numeric values and allowable exceedance frequencies – included to account for natural sources of bacteria);
- conditions of discharges from Copermittee's storm drain outfalls that are evaluated by comparing measured conditions to water quality objectives and/or required load reductions; and
- Implementation of the WQIP (i.e., establishment of goals, implementation of strategies and schedules).

Modeling has been conducted to establish numeric targets for the goals. Since there is an opportunity in 2016 to update the bacteria TMDL based on sound scientific studies, which may amend the current targets, goals may be modified based on outcomes of the bacteria TMDL revision process. As the WQIP is implemented, the Participating Agencies will use adaptive management, as discussed in Section 4 of this WQIP (to be submitted in June 2015), to re-evaluate goals and improve strategies to effectively address priorities.

Figure 3 illustrates the timelines and relationships between the goals; additional details on the proposed schedule are provided in Section 3.2.4.

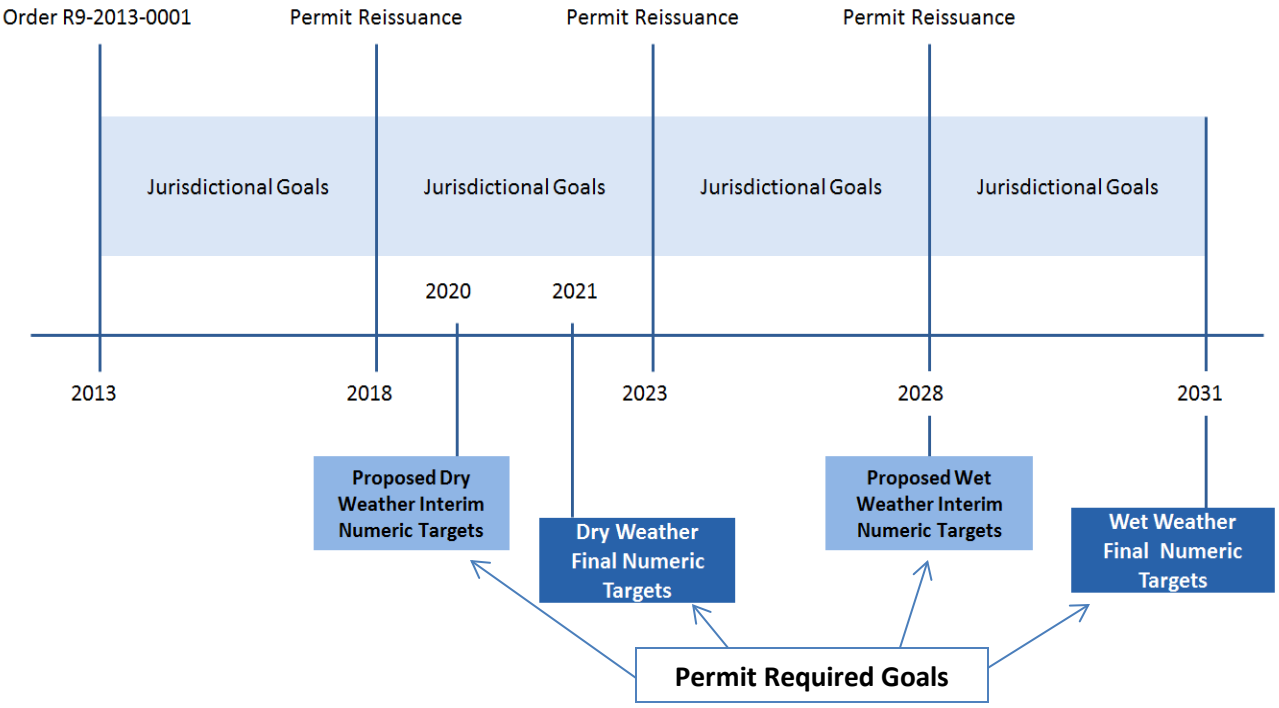

Figure 3. Timelines and Relationships between Bacteria TMDL Numeric Targets

3.2.1 *Compliance Pathways for Required Interim Goals*

Since each compliance pathway provides an independent option to demonstrate progress and ultimately compliance with the TMDL, any one of the following compliance pathways may be used for assessment purposes in the WQIP. That is, all pathways do not have to be assessed, but are options for use in the WQIP. The compliance pathways to achieve interim required goals, summarized from Attachment E of the Permit, are presented in Table 2.

Table 2. Compliance Pathways to Achieve Required Interim TMDL Goals

Pathway	Title	Interim Target	Metric	Values to be met		
				Indicator	Dry[c]	Wet
1 OR	Meet bacteria allowable exceedance frequency of receiving water objectives	No exceedances of the interim receiving water limitations;	Exceedance frequencies as measured in receiving waters.	Total Coliform[a]	.28% AEF[d]	46% AEF
				Fecal Coliform	0% AEF	43% AEF
				Enterococcus	1.5% AEF	49%(creeks) 51% (Beaches) AEF
2 OR	No discharge from stormwater drain outfalls	No direct or indirect discharge from the Participating Agencies' storm drain outfalls to the receiving water;	Assessment of presence/absence of flow and connectivity with receiving water.	Flow observations or measurements		
3 OR	Reduce loads at storm drain outfalls	The pollutant load reductions for discharges from the Participating Agencies' outfalls are greater than the required load reduction;	Pollutant load reductions.	Total Coliform	37.02% reduction	19.07% reduction
				Fecal Coliform	34.72% reduction	26.61% reduction
				Enterococcus	46.98% reduction	21.37% reduction
4 OR	Show Exceedances are from natural sources	Demonstrate that exceedances of final receiving water limitations are due to loads from natural sources	Implement Natural Source Exclusion (NSE) Approach	Monitoring and assessment of receiving water and watershed which supports the NSE approach		
5 OR	No exceedances of final receiving water limitations	There are no exceedances of the final receiving water limitations in the receiving water at, or downstream of Participating Agencies' stormdrain outfalls	Assessment of receiving water	Monitoring and assessment of receiving water indicating limitations have not been exceeded		
6	Implement WQIP and use adaptive management	The Participating Agencies develop and implement an accepted WQIP[b]	Implementation of jurisdictional strategies	Implementation of jurisdictional strategies as developed in accepted WQIP and designed to meet interim goals 1, 2 and/or 3.		

a. Receiving water limitations for total coliform only apply to beaches.

b. The WQIP must provide reasonable assurance that the interim TMDL compliance requirements in Attachment E of the Permit will be met via implementation, must be accepted by the San Diego Regional Water Board, and must be fully implemented by the Participating Agencies.

c. Dry weather measurements at beaches.

d. AEF - allowable exceedance frequency is the percent of samples that can exceed the single sample maximum of geometric mean and still be in compliance; the AEF is calculated based on the presence of bacteria loading from natural sources

In addition to the interim goals, achievement of any of the final goals will satisfy compliance with the interim TMDL requirements, as they are more stringent than the interim goals.

3.2.2 *COMPLIANCE PATHWAYS FOR REQUIRED FINAL GOALS*

Similar to the interim TMDL goals, the final TMDL goals include multiple pathways to demonstrate compliance. The final goal pathways, summarized from Attachment E of the Permit, are presented in Table 3.

Table 3. Pathways to Achieve Required Final TMDL Goals

Compliance Pathway	Final Target	Final Metric	Measurement					
			Indicator	Dry Weather			Wet Weather	
1 OR	No exceedances of the final receiving water limitations in the receiving water;	Bacteria concentrations (MPN or CFU/100 ml) and exceedance frequencies in receiving waters are less than or equal to allowable values;		SSM[a]	GM[b]	AEF[c]	SSM	AEF
			Total Coliform[d]	10,000	1,000	0%	10,000	22%
			Fecal Coliform	400	200	0%	400	22%
			Enterococcus (beaches)	104	35	0%	104	22%
			Enterococcus (creeks)	61	33		61	
2 OR	No direct or indirect discharge from the Participating Agencies' storm drain outfalls to the receiving water;	Assessment of presence/absence of flow and connectivity with receiving water;	Flow observations or measurements.					
3 OR	There are no exceedances of the final effluent limitations at the Participating Agencies' storm drain outfalls;	Bacteria concentrations (MPN or CFU/100 ml) and exceedance frequencies in discharges;		Dry			Wet	
				SSM	GM	AEF[e]	SSM	AEF[f]
			Total Coliform[g]	10,000	1,000	0%	10,000	22%
			Fecal Coliform	400	200	0%	400	22%
			Enterococcus (beaches)[h]	104	35	0%	104	22%
			Enterococcus (creeks)[i]	61	33		61	
4 OR	The pollutant load reductions for discharges from the Participating Agencies' storm drain outfalls are greater than or equal to the final load reductions;	Load reductions in discharges are greater than or equal to required load reductions. The calculation requires an understanding of the baseline load[j], which can be used to estimate a target load reduction;		Percent Reduction (Dry)			Percent Reduction (Wet)	
			Total Coliform	74.03%			34.7%	
			Fecal Coliform	69.44%			34.7%	
			Enterococcus	93.96%			34.7%	
5 OR	Exceedances of the final receiving water limitations in the receiving water are due to loads from natural sources and pollutant loads from the Participating Agencies' storm drain outfalls are not causing or contributing to the exceedances;	Microbial source tracking results as measured in the receiving water downstream of stormwater drain outfalls;	Microbial source tracking results show anthropogenic markers are below the limits of reporting in the receiving water at the time of the exceedance in most samples.					
6	The Participating Agencies develop and implement an adopted Water Quality Improvement Plan that includes a watershed model or other watershed analytical tool(s)	Implementation of jurisdictional strategies designed to meet goals. Use an adaptive management approach to improve implementation of jurisdictional strategies to reach goals.	Implementation of jurisdictional strategies as outlined in the WQIP, and of the required monitoring and assessment program.					

a SSM = single sample maximum or the highest allowable concentration of bacteria contained in one discreet sample

b GM = geometric mean calculated based on multiple samples over a given time frame as defined by the Ocean Plan

c AEF = allowable exceedance frequency is the percent of samples that can exceed the single sample maximum of geometric mean and still be in compliance; the AEF is calculated based on the presence of bacteria loading from natural sources

d Receiving water limitations for total coliform only apply to beaches.

e For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches and the Basin Plan for discharges to creeks and creek mouths.

f The 22% single sample maximum allowable exceedance frequency only applies to wet weather days.

g Total coliform effluent limitations only apply to storm drain outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0 of Attachment E of Order R9-2013-0001.

h This enterococcus effluent limitation applies to storm drain discharges to segments of areas of the Pacific Ocean Shoreline listed in Table 6.0 of Attachment E of Order R9-2013-0001.

i This enterococcus effluent limitation applies to storm drain discharges to segments of areas of the creeks or creek mouths listed in Table 6.0 of Attachment E of Order R9-2013-0001.

j The baseline loads for the lower SDR watershed were determined through modeling, and are presented in Appendix B. Wet weather target load reductions (TLRs) for this WQIP were taken from the City of San Diego Phase II CLRP (Tetra Tech 2013). Fecal coliform was used to represent all bacteria for the purposes of this modeling.

3.2.3 *JURISDICTIONAL GOALS*

The Participating Agencies have each developed "jurisdictional goals" to demonstrate individual progress towards interim and final TMDL goals and to meet the overall purpose of the Permit: to protect the physical, chemical and biological integrity of waterbodies. The Permit does not require each jurisdiction to have numeric goals in every permit term, only that one jurisdiction or the overall watershed has a numeric goal for each permit term. The implementation of goals will depend upon approval of funding in future annual budgets.

Each jurisdiction has developed its own goals that will result in a positive, measureable impact on water quality in the San Diego River Watershed. Wet and dry weather jurisdictional goals are proposed for each 5-year permitting cycle, through the implementation period of the Bacteria TMDL (2021 for dry weather and 2031 for wet weather). Jurisdictional goals for each participating agency are summarized below and in Tables 4 through 13.

3.2.3.1 Jurisdictional Goals for City of El Cajon

The City of El Cajon has established a dry weather goal for the 2013-2018 permit term involving the reduction of controllable dry weather persistent flows. Specifically, El Cajon's goal is to reduce the volume of dry weather flows or the number of storm drains with dry weather flows by 10%. The City of El Cajon will establish a baseline to for the volume reduction in 2015. Following the establishment of the baseline and initial reduction, El Cajon will maintain a 10% reduction in flows or the number of storm drains with dry weather flows and expand reduction based on program effectiveness and funding availability.

Table 4. City of El Cajon Dry Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [b]	TMDL Final Compliance Date April 4, 2021
Reduce controllable dry weather persistent flows	% reduction of flow volume or number of outfalls with flows mitigated from persistently flowing storm drain outfalls.	Baseline will be developed from previous dry weather monitoring data.	Effectively reduce controllable dry weather flow from storm drain outfalls to receiving water.	Reduce the volume of dry weather flows or the number of storm drains with dry weather flows by 10%.	Maintain 10% reduction in flows or the number of storm drains with dry weather flows and expand reduction based on results of previous actions and availability of funds.	Effectively reduce dry weather discharges from storm drain outfalls to the receiving water.
Transient encampment removal events	Increase the number of annual transient encampment removal events throughout the City's drainage channels.	Yearly average of five (5) removal events during R9-2007-0001 permit cycle to help remove 25 cubic yards of trash and debris.	Increase annual transient encampment removal events to a minimum of eight (8) annual events to increase to 40 cubic yards of trash and debris to help reduce bacterial pollutant loads for total coliform fecal coliform and enterococcus.	Reduce gross pollutants that may contribute to bacteria loads by increasing the number of cubic yards of debris collected from drainage channels.	Continue to conduct a minimum of 8 transient encampment removal events per year and adjust the number of events accordingly to achieve compliance.	Continue to conduct a minimum of 8 transient encampment removal events per year and adjust the number of events accordingly and achieve compliance to achieve compliance with load reduction of 37.02% total coliform, 34.72% fecal coliform and 46.98% enterococcus respectively.

Table 5. City of El Cajon Wet Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Non-structural BMP (Creek Cleanup)	Reduce bacterial loads in Forrester Creek	5 cubic yards of solid waste (i.e. trash and debris) per cleanup event	Reduce trash and debris to help reduce bacteria loads.	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.	Reduce bacteria loads by an additional 14% (total 19 %) from the storm drain outfalls by continues implementation of programmatic Non-structural BMPs.
Non-structural BMP (Pet Waste Outreach)	Reduce bacterial loads in Forrester Creek	5 cubic yards of solid waste (i.e. trash and debris) per event	Reduce trash and debris to help reduce bacteria loads.	Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities).	Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities).	Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities and educational institutions).	Reduce bacteria loads by an additional 14% (total 19 %) from the storm drain outfalls by continues implementation of programmatic Non-structural BMPs.
Structural BMPs feasibility study , adaptive management	Develop structural BMPs to help reduce bacterial load by 30%-40% to help meet wet weather TMDL allocations	Total Coliform 3,101 MPN/100mL (2004-2010 SDR outlet); Fecal Coliform Jurisdictional load (1993 Water year) $2{,}000 \times 10^{12}$ MPN/yr; Enterococcus	Reduce total coliform, fecal coliform and enterococcus by 30-40%.	Develop feasibility study to assess dry/wet weather treatment control BMPs and draft environmental impact report for treatment control BMPs.	Complete EIR for treatment control BMPs (High Rate Media Filter - Gross Solids Filter).	Collaborate with other watershed jurisdictions for planning, conceptual design and full design for select BMPs engineering, siting, and environmental review as funding becomes available.	Operate and manage full scale BMPs (i.e. High Rate Media Filter), coordinate with the County of San Diego.

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
		252 MPN/100mL (2004-2010 SDR outlet)					
Implement WQIP with focus on programmatic BMPs and use adaptive management to increase effectiveness	Percent Total Coliform bacterial load reduction	Total Coliform 3,101 MPN/100mL (2004-2010 SDR outlet)	Reduce total coliform bacterial load by 19.07% from storm drain outfalls to help meet TMDL load reduction.	Implement programmatic (non-structural) BMPs to help achieve source reduction of bacterial loads from storm drain outfalls.	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.	Reduce bacteria loads by an additional 4 % (total of 5%) from the storm drain outfalls by continued implementation of programmatic BMPs and structural BMPs.	Reduce bacteria loads by an additional 14% (total 19 %) from the storm drain outfalls by continues implementation of programmatic BMPs and structural BMPs.
Implement WQIP with focus on programmatic BMPs and use adaptive management to increase effectiveness	Percent Fecal Coliform bacterial load reduction	Fecal Coliform Jurisdictional load (1993 Water year) $2{,}000 \times 10^{12}$ MPN/yr	Reduce fecal coliform bacterial load by 26.61% from storm drain outfalls to help meet TMDL load reduction.	Implement programmatic (non-structural) BMPs to help achieve source reduction of bacterial loads from storm drain outfalls.	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.	Reduce bacteria loads by an additional 4 % (total of 5%) from the storm drain outfalls by continued implementation of programmatic BMPs and structural BMPs.	Reduce fecal coliform bacterial load by 26.61% from the storm drain outfalls by continuing the implementation of programmatic BMPs and structural BMPs.
Implement WQIP with focus on programmatic BMPs and use adaptive management	Percent Enterococcus bacterial load reduction	Enterococcus 252 MPN/100mL (2004-2010 SDR outlet)	Reduce enterococcus bacterial load by 21.37% from storm drain outfalls to help meet TMDL load reduction.	Implement programmatic (non-structural) BMPs to help achieve source reduction of bacterial loads from storm drain outfalls.	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.	Reduce bacteria loads by an additional 4 % (total of 5%) from the storm drain outfalls by continued implementation of programmatic BMPs and structural BMPs.	Reduce enterococcus bacterial load by 21.37% from the storm drain outfalls by continuing the implementation of programmatic BMPs and structural BMPs.

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
to increase effectiveness							

3.2.3.2 Jurisdictional Goals for City of La Mesa

The City of La Mesa has established the dry and wet weather goal of performing a creek restoration project on Alvarado Creek, upstream of the box culvert at the SR-125 freeway. The restoration will involve 900 feet of restoration along the creek. Following the completion of the restoration project, the City of La Mesa will conduct the Alvarado Trunk Main Sewer Replacement Project. The project will replace approximately .75 miles of trunk sewer located under or in very close proximity to Alvarado Creek.

Table 6. City of La Mesa Dry Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [b]	TMDL Final Compliance Date April 4, 2021
Creek restoration project	Linear Feet of Structural Projects	Existing channel conditions	Structural Project Completion	Perform 900 LF of Alvarado Creek restoration program.	Conduct Alvarado Trunk Main Sewer Replacement Project which will replace approx. 0.75 miles of trunk sewer located under or in very close proximity to Alvarado Creek.	Meet TMDL Final Compliance Requirements [Attachment E, 6.b(3)]

Table 7. City of La Mesa Wet Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 [c] [d]	Meet TMDL Final Compliance Date April 4, 2031
Creek restoration project	Linear Feet of Structural Projects	Existing channel conditions	Structural Project Completion	Perform 900 Linear Feet of Alvarado Creek restoration program.	Conduct Alvarado Trunk Main Sewer Replacement Project which will replace .75 miles of trunk sewer.	Comply with any of the TMDL Interim Compliance Requirements [Attachment E, 6.c(3)]	Comply with any of the TMDL Final Compliance Requirements [Attachment E, 6.b(3)]

3.2.3.3 Jurisdictional Goals for City of Santee

Recognizing that urban runoff is generally a controllable source that contributes to the mobilization of bacteria, the City of Santee will primarily focus its efforts on addressing dry weather runoff. Based on cumulative monitoring studies conducted by various organizations such as the San Diego River Park Foundations State of the River Report and those referenced and summarized within the Comprehensive Load Reduction Plan, the known sources of bacteria include anthropogenic (human and pet contributions), high density areas and industry (multi-family housing, high use areas such as retail centers, and eateries), outdoor water use and urban runoff (over irrigation, pavement washing), and natural (wildlife) contributors. Based on historical data from the City of Santee's Monitoring Program, the primary areas of concern (where bacteria exceedances are consistently measured) are at the outfalls along the river between Cuyamaca Street and Carlton Hills Boulevard.

With the overall objective of reducing or stopping controllable (non-permitted) sources of urban runoff, the City of Santee has selected four actions/goals for dry weather compliance: 1) Implement a dry-weather inspection and investigation program (separate from the monitoring program component); 2) Implement a 'complete property' inspection program which focuses attention to high density or high-use areas including multi-family housing developments and industrial/commercial centers; 3) Implement a component to the existing inspection program which addresses housekeeping practices at eateries; and 4) Promote outdoor water use efficiency and conservation practices.

For the first goal, the City will develop and implement a plan for conducting dry weather flow inspections and investigations of those areas tributary to the channels that are commonly known to have dry weather flows (Woodglen Vista Creek and Sycamore Creek). By performing inspection and upstream investigations on a routine basis, the City hopes to attain a reduction of outfalls with persistent flows. With the second goal, the City will map its inventory of businesses and multifamily – high density housing developments in correlation to the known bacteria exceedance outfalls, to identify high-priority areas to target program efforts. The City will inspect these properties in their entirety, as opposed to business based (ie: complete malls, retail centers, etc). Inspections will focus toward dumpster / trash enclosure maintenance. For the third goal, the City will implement a targeted approach to address housekeeping practices at local eateries to include grease management, trash enclosures, and outdoor seating areas. Lastly, efforts will address outdoor water use through partnerships with both the Santee Unified School District and Padre Dam Municipal Water District. The City will enhance its efforts to encourage outdoor water efficiency and conservation to prevent runoff through outreach, education, and inspections.

For the wet weather goals, the city of Santee will address trash removal as a way to prevent the mobilization and regrowth of bacteria. Plans include partnering with other organizations on river and/or community clean-up events, improvements to the encampment inspection and removal program, and increasing the number of pet waste stations and trash bins in regional parks. Efforts will be focused on those geographical areas that are identified to be contributing to the highest bacteria levels (as described in the dry-weather goals). Following this effort, Santee plans to retrofit a total of 1.6 acres of drainage area. Planning and conceptual design for structural BMPs will be conducted as need and funding becomes available.

Success will be measured by routine monitoring – both visual and physical sampling. Therefore, the City will implement a complimentary monitoring program that will be able to demonstrate program effectiveness, and progress toward attaining goals. Through an iterative approach, the City will be able to refine efforts as needed to improve the progress toward achieving the Bacteria goals within the WQIP and to comply with the TMDL. Success will be determined based on the ability to achieve measurable reductions in average bacterial loads within the City's jurisdiction.

Table 8. City of Santee Dry Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [b]	TMDL Final Compliance Date April 4, 2021
Dry Weather Investigations	Visual confirmation	Number of dry weather flows based on 2013-2014 monitoring records.	Achieve a 25% reduction in urban runoff / dry weather flows, as measured at outfalls.	Implement a dry-weather inspection and investigation program (separate from the monitoring program component). Dedicate 10% of compliance inspection hours to conduct dry weather investigations.	Reduce the number of storm drain outfalls with dry weather flows in areas tributary to Woodglen Vista Creek and Sycamore Creek by 10%.	Reduce the number of storm drain outfalls with dry weather flows in areas tributary to Woodglen Vista Creek and Sycamore Creek by an additional 15% (25% total).
'Complete Property' Inspection Program	Visual and physical confirmation; monitoring of targeted outfalls to be performed before and during implementation	Average loading (monitoring year 2012-2013)	Achieve 25% reduction of bacteria load levels at outfalls downstream of high priority areas.	Inspect 50% high priority, high-density use areas (residential & commercial/industrial). Focused inspections on pavement, landscape and trash enclosures.	Inspect remaining high priority, high-density use areas (residential & commercial/industrial). Focused inspections on pavement, landscape and trash enclosures.	Identify problem sites and implement escalating enforcement actions to achieve full compliance.
Eateries Inspection Program	Visual and physical confirmation; monitoring of targeted outfalls to be performed before and during implementation	Average loading (monitoring year 2012-2013)	Achieve measurable reduction of bacteria load levels at outfalls downstream of high priority areas.	Inspect 50% of high priority eateries. Focused inspections on grease storage, trash enclosures, outdoor seating areas	Inspect remaining high priority eateries. Focused inspections on grease storage, trash enclosures, outdoor seating areas	Identify problem sites and implement escalating enforcement actions to achieve full compliance.
Outdoor Water Use Efficiency and Conservation	Pre & post surveys; reduction in water use.	Surveys; Average water use per capita; dry weather monitoring data	Achieve measurable reduction of average bacteria load levels at outfalls downstream from high priority areas.	Develop Residential Management Area (RMA) program. Distribute outreach materials addressing outdoor water use, water conservation, and water quality to all high-	Review 50% of projects that require landscape and irrigation plans for compliance with the City's Landscape Ordinance. Participate and/or promote incentive programs.	Full implementation of RMA program. Review 100% of landscape and irrigation plans for compliance with the City's Landscape Ordinance.

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [b]	TMDL Final Compliance Date April 4, 2021
				priority properties (areas). Partner with Santee School District to disseminate information and integrate efforts.		

Table 9. City of Santee Wet Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Retrofit projects	Acreage retrofitted	Existing retrofitted areas include Forester Creek and Woodglen Vista Creek	Retrofit a total of 2 acres of drainage area	Identify candidate locations for off-site compliance. Develop Water Quality Equivalencies (credit system).	Implement off-site (alternative) Compliance Program.	Develop and implement a plan for a Green Streets (a.k.a Complete Streets Program). Develop minimum BMPs for all CIP projects.	Full implementation of Alternative Compliance Program and Complete Streets program.
Trash Management Program	Trash removal rates/quantities (Tonnage removed); visual surveys	Average number of encampments; trash removal rate/quantity	Reduce average number of river encampments; decreased presence of trash (reduced removal rate/quantities)	Bi-monthly river encampment sweeps with follow up trash removal. Increase efforts to provide referrals to local community services.	Increase accessibility to various waste disposal needs.	Secure funding or community investments to provide and maintain public sanitary facilities.	Obtain community involvement to implement regular disposal and cleanup events.

3.2.3.4 Jurisdictional Goals for City of San Diego

In addition to the numeric goals based on Attachment E of the Permit identified in Tables 2 and 3, which demonstrate sustained water quality improvement over longer periods of time, interim wet and dry weather performance-based goals have been established by the City of San Diego to measure short-term jurisdictional progress toward achieving the final goals during the current permit cycle (Table 10).

The City of San Diego established a jurisdictional wet and dry weather interim numeric goal to develop and implement a policy that requires the inclusion of green infrastructure features on all suitable City projects, including non-SUSMP (Standard Urban Stormwater Management Plan) projects. This policy will be coordinated with ongoing efforts to update City design manuals and low-impact (LID) design standards for public LID BMPs. To guide implementation of the new policy, a green infrastructure program will be initiated in parallel. The program will begin with research and recommendations for ideal methods for green infrastructure project siting and prioritization within the City, but will ultimately result in the construction of additional green infrastructure projects. By FY 2018, the City will have implemented this policy, attained City Council approval, and constructed four green infrastructure BMPs within the WMA that will treat an estimated 58.4 acres of drainage area.

The City also established a jurisdictional dry weather interim numeric goal to implement a suite of irrigation runoff reduction programs that include more targeted education and outreach, enhanced business inspections, additional water conservation rebate programs, and increased enforcement. By FY 2018, the City anticipates a ten percent reduction in flow from its persistently flowing outfalls in the WMA during dry weather based on these efforts. Historical dry weather monitoring data will be used to establish baseline flows from persistency flowing outfalls.

Table 10. City of San Diego Dry Weather Jurisdictional Numeric Goals

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	12.6% Days Exceeding WQO (2002[2])	See performance measures	6.3%	0%
	Enterococcus	19% Days Exceeding WQO (2002[2])		9.5%	0%
OR					
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historic MS4 dry weather data will be used to identify the baseline in the first annual report	See performance measures	0%	0%
	Enterococcus			0%	0%
OR					
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	49.4%	98.8%
	Enterococcus			49.9%	99.9%
OR					
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule based on analysis results (Appendix E). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 3.3.4 and Appendix E for modeling discussion			
OR					
MS4 Discharges # of Direct or Indirect MS4 Discharges to Receiving Water		Number of persistently flowing major MS4 outfalls provided in the Monitoring and Assessment Program Section of this WQIP	See performance measures	0	0
OR					
% of Exceedances of	Fecal coliform	Not available	100%	100%	100%

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
Final Receiving Water WQOs due to Natural Sources[3]	*Enterococcus*		100%	100%	100%
Performance Measures					
Suite of Strategies to Measure Performance during First Permit Term		**Baseline**	**FY18**		
Develop green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather		0 acres treated in 2002, the year used as baseline in the Bacteria TMDL	58.4 acres of drainage area treated through construction of 4 green infrastructure BMPs		
Irrigation runoff reduction programs including targeted education and outreach, enhanced inspections, rebates[4], and increased enforcement		Historical dry weather monitoring data will be used to establish a baseline in the first WQIP annual report	10% reduction in flow from baseline measured at persistently flowing outfalls in the WMA during dry weather		

1. Denotes total maximum daily load (TMDL) interim and final water quality-based effluent limitation (WQBEL).
2. The existing exceedance frequency was calculated based on available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix B.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
4. City of San Diego rebates include grass replacement, rainwater harvesting, downspout disconnect, and microirrigation.

% = percent; FY = fiscal year; WQO = Water Quality Objective

Table 11. City of San Diego Wet Weather Jurisdictional Numeric Goals

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	72% Days Exceeding WQO (2002 TMDL Model)	See performance measures	72%[2]	43%	35%	22%
	Enterococcus – San Diego River	78% Days Exceeding WQO (2002 TMDL Model)		78%[2]	49%	36%	22%
	Enterococcus – Pacific Ocean Shoreline	81% Days Exceeding WQO (2002 TMDL Model)		81%	51%	37%	22%
OR							
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historic MS4 wet weather data will be used to identify the baseline in the first annual report	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
OR							
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	5.2%	17.3%	23.9%	34.7%
	Enterococcus			4.2%	14.1%	19.5%	28.2%
OR							
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 3.3.5 and Appendix D for modeling results.					
OR							
MS4 Discharges # of Direct or Indirect MS4 Discharges to Receiving Water		Number of flowing major MS4 outfalls during wet weather monitoring (See Monitoring and Assessment Section of this	See performance measures	0	0	0	0

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
		WQIP).					
OR							
% Exceedances of Final Receiving Water WQOs due to Natural Sources[3]	Fecal coliform	Not available	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%

Performance Measures		
Suite of Strategies to Measure Performance during First Permit Term	**Baseline**	**FY18**
Develop green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather	0 acres treated in 2002, the year used as baseline in the Bacteria TMDL	58.4 acres of drainage area treated through construction of 4 green infrastructure BMPs

1. Denotes total maximum daily load (TMDL) interim and final water quality-based effluent limitation (WQBEL).
2. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Responsible Agencies by maintaining the existing wet weather exceedance frequency.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

3.2.3.5 Jurisdictional Goals for County of San Diego

The County of San Diego has established dry weather numeric goals for the highest priority water quality condition of bacteria in the San Diego River watershed. To comply with the Permit's final TMDL compliance requirements, anthropogenic dry weather discharges from storm drain outfalls to the receiving water must be eliminated. Throughout the implementation of the WQIP, adaptive management will be used to evaluate reasonable progress toward the numeric goals and to consider changes to program design and project implementation, as needed to meet goals and as funding becomes available. This process will be further described in the final WQIP.

The dry weather goal was established to eliminate anthropogenic (excludes groundwater and other exempt or permitted non-stormwater flow) dry weather flow in storm drains to zero, in order to reduce pollutant loading to water bodies during dry weather. This goal will be accomplished through the implementation of numerous JRMP strategies to mitigate dry weather flows from storm drain outfall, as described in the County of San Diego JRMP. In particular, the County has shifted to a more active field program to better locate and abate dry weather flow. County Stormwater Staff spend a greater frequency of time present in Unincorporated communities identifying nuisance anthropogenic flows and addressing them through appropriate education and enforcement strategies. All County staff members have been trained to identify and report illicit discharges and illicit connections during required annual stormwater training; this training has been updated to reflect recent Permit changes.

In addition to the increase in County staff field surveillance, staff is also implementing a focused program to reduce flow at targeted storm drain outfalls that have demonstrated persistent dry weather flow conditions. Using dry weather monitoring data collected from 2013 to 2015, the County has determined 19 priority outfalls in the San Diego River Watershed that will be monitored for dry weather flow regularly. If dry weather flows are detected, staff will initiate a field investigation to seek out and abate the source of flow.

Using the above strategies, The County will target to reduce the number of persistently flowing outfalls by 20% by 2018. Alternatively, the County may demonstrate a 20% decrease in the aggregate flow of the stormwater outfalls by 2018. A baseline volume of flow would be established during FY 2015-16 through special monitoring studies. Efforts will be adaptively managed to mitigate dry weather flows and consider designing small-scale structural controls as needed during the second Permit term. For the final TMDL compliance goal, scheduled for April 2021, the overall goal is no discharges from the County of San Diego's storm drain outfalls to the receiving water, as demonstrated through the storm drain outfall monitoring program.

The County has established several wet weather numeric goals for the highest priority water quality condition of bacteria in the San Diego River watershed. One of the compliance options for the TMDL requires a 34.7% reduction of the bacteria load from storm drain outfalls by 2031. Half of the load reduction, 17.35%, is required by the interim TMDL target date. Programmatic approaches and structural BMPs are estimated to reduce bacteria loads by 10% and 24.7%, respectively.

The programmatic approach involves reducing bacteria loads from storm drain outfalls. The metric established is the implementation of the stormwater program, resulting in an estimated 10% reduction of the bacteria loads needed to meet compliance. The baseline established for the goal is to reduce the overall bacteria loads of 1,727x10^12 MPN/yr by 10%, demonstrated by the analytical spreadsheet

approach. The load reduction is anticipated to take place incrementally by permit term, with a 2% reduction during the second permit term, a 4% reduction during the third permit term, and a 4% reduction during the fourth permit term. If the modeled reductions are not confirmed by monitoring, then program adjustments will be made according to the adaptive management process. This may require the incorporation of more effective strategies, changes in program design, or incorporation of additional structural BMPs if funding is available.

The County will implement distributed BMPs with the desired outcome of reducing bacteria loads from storm drain outfalls based on quantitative modeling estimates and bacteria loads reduced annually from storm drain outfalls. Retrofit projects implemented from 2003-2009 were used in the quantitative model to reduce the baseline loads. The percent reduction of baseline loads from drainage retrofitted was utilized as the metric for the retrofit goals. The first permit term goal includes the retrofitting of 392 acres through redevelopment requirements (treatment control BMPs), which results in a reduction of the baseline loads. Further planning and design will be developed in future permit terms as needed and as funding becomes available, with the goal of meeting the required reductions of the baseline load by the April 2031 final TMDL compliance, through construction of additional distributed structural BMPs for a reduction of up to 4% of bacteria loads.

The County also has a goal of developing a small-scale residential incentive program. This program is a public-private partnership program focused on residential participation. Opportunities to expand the program to include business community participation will also be explored. The outcome of the goal is the capture and use, or diversion of, bacteria loads from storm drain outfalls to landscaped areas. The metric for the goal is the percent reduction of baseline loads from construction of small-scale BMPs. An analytical spreadsheet was used to estimate the bacteria load reduction from rooftop stormwater runoff (Appendix C). The first permit term will be utilized for planning and evaluation of the feasibility of a pilot residential incentive program to encourage rain water use through rain barrels, roof downspouts redirected to landscaped areas, rain gardens and other small scale infiltration BMPs. If feasible, the second through the forth permit terms will include expansion of the program through incremental increases in the program scale (up to approximately 12% of single-family residences), and measured through reductions in the baseline bacteria loads of an estimated 2% for the second term, 6% for the third term, and a total of 9.8% by the forth term.

The County of San Diego also has established a multi-benefit goal of reducing bacteria in the stormwater conveyance system through implementation of structural BMPs. A partnership will be established with the Lakeside River Park Conservancy for potential structural BMP implementation. The baseline used for the goal includes quantitative modeling to estimate percent load reductions from structural BMPs, with the metric of a total bacteria load reduction of 11% of the baseline. The planning, full design, engineering, siting, and environmental review for select BMPs, will be conducted beginning in the second permit term as needed and as funding becomes available. Planning will continue through the third permit term. During the fourth permit term, the structural BMP(s) will be constructed, if needed and if funding is available, to meet final compliance load reduction goals (as demonstrated through modeling). The following structural BMP or equivalent will result in 11% load reduction based on the quantitative modeling summarized in Section 3.3.5 and detailed in Appendix D.

- SDCO-R-01: Regional BMP - Wet Pond/Subsurface flow wetland (Partnership with Lakeside River Park Conservancy)

- Suite of distributed BMPs
    - retrofits such as permeable pavement of parking lots, non-traveled right of way, and other localized infiltration or bioretention BMPs

Water quality monitoring of structural BMPs will be used to determine compliance with the final Bacteria TMDL goal.

Because there is uncertainty inherent in some of the modeling parameters used to estimate load reduction benefits, optional strategies have been developed for consideration to achieve load reduction goals if necessary. These will be implemented as necessary based on the adaptive management model upon which this WQIP is based. Optional jurisdictional strategies include methods that agencies may pursue if additional measures are necessary to meet and achieve interim and final numeric goals. Implementation of the optional strategies will be contingent on circumstances supported by the need for the additional effort, the cost and benefit as compared to other options and strategies, and the availability of funding.

Table 12. County of San Diego Dry Weather Jurisdictional Numeric Goals

Dry Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition - Bacteria[3]						
Title	**Metric**	**Baseline**	**Outcome**	**1st Permit Term Numeric Goals 2013 - 2018**	**2nd Permit Term Numeric Goals 2018 - 2023**	
					TMDL Interim Compliance Date April 4, 2020 [2]	**TMDL Final Compliance Date April 4, 2021**
Eliminate anthropogenic dry weather flows [1] from storm drain outfalls	% reduction of flow volume or number of outfalls with persistent flows	To be established FY 15-16 using dry weather flow measurements.	Effectively eliminate anthropogenic dry weather flow from storm drain outfalls to receiving water.	Reduce by 20 % the aggregate flow volume or the number of persistently flowing outfalls.	Reduce by 75 % the aggregate flow volume or the number of persistently flowing outfalls.	Effectively eliminate anthropogenic dry weather discharges from storm drain outfalls to the receiving water.

1. Here and throughout this table, the term "dry weather flows" excludes groundwater, other exempt or permitted non-stormwater flows, and sanitary sewer overflows.
2. Request moving Interim TMDL Compliance Date from April 4, 2017 (per Attachment E, 6.c(1)) to April 4, 2020 to allow adequate time to investigate and mitigate dry weather flows through the adaptive management process of the WQIP.
3. The County of San Diego is concerned that a long-term funding source is not identified for constructing and maintaining structural BMPs, if structural BMPs are needed to meet compliance.

Table 13. County of San Diego Wet Weather Jurisdictional Numeric Goals

Wet Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition - Bacteria[3]							
Title	**Metric**	**Baseline**	**Outcome**	**1st Permit Term 2013 - 2018**	**2nd Permit Term 2018 - 2023**	**3rd Permit Term 2023 - 2028**	**4th Permit Term 2028 - 2033**
						Meet TMDL Interim Compliance Date April 4, 2028 [1] [2]	**Meet TMDL Final Compliance Date April 4, 2031**
Implement WQIP with focus on programmatic BMPs and use adaptive management to increase effectiveness	% bacterial load reduction	1,727 x 10^{12} MPN during Water Year 2003	Reduce baseline bacteria loads by 10 % from storm drain outfalls to meet TMDL required load reductions.	Implement programmatic (non-structural) BMPs to achieve source reduction of bacteria loads from the storm drain outfalls.	Reduce bacteria loads by 2 % from the storm drain outfalls through continued implementation of programmatic BMPs and, based on adaptive management, focus and enhance efforts where needed .	Reduce bacteria loads by an additional 4% (total 6%) from the storm drain outfalls by continued implementation of programmatic BMPs.	Reduce bacteria loads by an additional 4% (total 10 %) from the storm drain outfalls by continued implementation of programmatic BMPs.
Structural BMPs (as needed and as funding is available)	% bacterial load reduction based on quantitative model	1,727 x 10^{12} MPN during Water Year 2003	Reduce baseline bacteria loads by 24.7% from storm drain outfalls to receiving water to meet TMDL required load reductions.	Reduce by 1% the baseline bacteria loads from distributed BMPs constructed between 2003 and 2009 during redevelopment.	Reduce bacteria loads by an additional 2 % through participation in the downspout disconnect public private partnership program. Begin planning & design for additional long-term structural BMPs.	Reduce bacteria loads by an additional 6% through additional participation in the downspout disconnect public private partnership program. 3.3 % reduction through BMPS required through redevelopment; Continue planning & permitting for long-term structural BMPs.	Reduce bacteria loads by a total of 13.3% from constructed distributed and regional structural BMPs (11%), and redevelopment (public-private partnerships (2.3%).

1. Request moving Interim TMDL Compliance Date from April 4, 2021 (per Attachment E, 6.c(1)) to April 4, 2028 to allow adequate time to monitor progress through the adaptive management process of the WQIP
2. Progress toward final goals will be monitored and if implemented distributed BMPs are not enough then additional structural BMPs based on quantitative modeling conducted as part of the WQIP will be considered. To prepare for this contingency additional design and planning work will be conducted during Permit 2 and are included in the optional jurisdictional strategies of Provision B.3 Goals, Strategies and Schedule report. The County of San Diego is concerned that a funding source to construct, operate and maintain structural controls is not identified.
3. The County of San Diego is concerned that a long-term funding source is not identified for constructing and maintaining structural BMPs, if structural BMPs are needed to meet compliance.

3.2.3.6 Jurisdictional Goals for Caltrans

Caltrans storm water flows are not included in the Municipal Stormwater Permit; however, Caltrans is subject to similar requirements through its own stormwater permit (State Board, 2012b). Caltrans has voluntarily contributed to the Water Quality Improvement Plan effort to provide a consistent and subwatershed-wide approach to meeting applicable TMDL requirements. The baseline strategies are continuously implemented and augmented as resources become available. Attachment IV to the Caltrans Stormwater Permit outlines a methodology for prioritizing stream segments included in TMDLs to which Caltrans is subject. The permit establishes BMP implementation requirements, evaluated in terms of compliance units. Caltrans is expected to achieve 1,650 compliance units per year through the implementation of retrofit BMPs, cooperative implementation, and post-construction treatment beyond permit requirements.

Impaired reaches throughout the state will be prioritized on the basis of several factors, including, but not limited to, percent reduction needed, Caltrans drainage area contributing to the reach, and proximity to receiving waters. Reaches with metals TMDLs will likely be prioritized. This prioritization list is currently under negotiation between Caltrans Head Quarter and State Water Control Board.

Caltrans' jurisdiction areas include roadways, land adjacent to roadways, and facilities. Caltrans' jurisdictional strategies specifically focus on BMP implementation to reduce known pollutants within these areas. Caltrans' strategies vary from those of other Responsible Agencies (in both type and name) to best address freeway characterization discharges from its right-of-way. Strategies include programs developed by Caltrans Headquarters for statewide execution and District 11 implementation. Caltrans' implementation of strategies with the WMA is dependent on legislative approval. For Bacteria TMDLs, Caltrans is expected to eliminate dry weather flows by implementing control measures to ensure effective prohibition (Provision B.2 of the Stormwater Permit). For wet weather flows, Caltrans is expected to implement control measures or BMPs to prevent discharge of bacteria from the right-of-way; this can be source control and preemptive activities such as street sweeping, cleanup of illegal dumping, and public education on littering. Implementation of these controls is per the TMDL prioritization list currently under development.

3.2.4 *SCHEDULE FOR COMPLIANCE WITH INTERIM AND FINAL GOALS*

The proposed schedule below reflects the time necessary to implement the proposed strategies outlined in Section 3.3 of the WQIP and detailed in Appendices C, D, and E. Since there is an opportunity in 2016 to update the bacteria TMDL based on sound scientific studies, which may modify the current targets, the Participating Agencies propose an alternative schedule for interim TMDL compliance dates. The proposed schedule for achievement of final Bacteria TMDL (and the final jurisdictional goals) is consistent with final compliance schedules contained in the Permit. The proposed schedule for the interim and final goals is provided in Table 14.

Table 14. Proposed Compliance Dates for Goals

Condition	Compliance Date
Interim Dry weather	April 4, 2020 [a]
Final Dry weather	April 4, 2021
Interim Wet weather	April 4, 2028 [a]
Final Wet weather	April 4, 2031

[a] The interim schedules presented in the Permit are April 4, 2017 for dry weather and April 4, 2021 for wet weather; as allowed by the Permit, the Participating Agencies propose an alternative schedule for interim TMDL compliance dates.

As stated above, the Participating Agencies propose an alternative schedule for interim TMDL compliance dates. Key considerations to support moving the Dry Weather Bacteria Interim Goal from 2017 to 2020 include:

- Allow time to ramp up efforts and leverage strategies to comply with the 2013 Permit requirement to effectively prohibit discharge of dry weather flows from the storm drain outfalls to waterbodies; and
- Allow time to investigate the sources of discharges to the storm drain system that may include the following activities:
  - Ramp up efforts to address spray from over-irrigation and leverage efforts with the water conservation message from the water districts in response to the current drought conditions; and
  - Prioritize discharges from storm drain outfalls using, for example, visual observation, genetic test results, closed circuit television, or other methods, and characterize the source(s) of persistent dry weather flows.

Key considerations to support moving wet weather interim goal from 2021 to 2028 include:

- Allow time to build on the successes of the nonstructural approaches such as education and outreach to the public to pick up pet waste, increased usage of downspout disconnects and rain barrels, increased use of swales and other bioretention devices to treat rainfall close to the source.
- Allow time for the current processes on potential updates to the Bacteria TMDL from stakeholder studies and a statewide update to the bacteria standards to evolve as these efforts could affect the number and/or sizing of structural controls:

  - The Copermittees have the opportunity to revisit the Bacteria TMDL in 2016 and are in the process of conducting studies to provide the scientific basis for proposed changes to the Bacteria TMDL.
  - The State Water Resources Control Board is conducting an effort to update the California bacterial standards for recreational activities to consider the United State Environmental Protection Agency's 2012 Recommended Recreational Guidelines. The scheduled adoption date is 2016.
- Assuming approximately seven years is required for a structural BMP to go from the planning phase through to construction, and if project planning began in 2017, the first complete structural BMP could be installed by 2024, if needed, to meet interim compliance goals. This exceeds the current interim deadline of 2021. Additional time is required to demonstrate the effectiveness of structural BMPs and to leverage lessons learned to cost effectively plan an implementation schedule for additional structural BMPs. For jurisdictions in multiple watersheds, an interim compliance date of 2028 provides the flexibility in having a staggered phasing plan for different watersheds.
- The County of San Diego is concerned that a long term funding source has not been identified to for the construction and ongoing operation and maintenance of the structural BMPS. An interim compliance date of 2028 allows additional time needed to pursue a long term funding source.

The goals will be achieved through implementation of the strategies summarized in Section 3.3 and further detailed in Appendices C, D, and E. The strategies are designed to attain the required and jurisdictional goals for the San Diego River Watershed and would be implemented at the jurisdictional scale.

3.3 WATER QUALITY IMPROVEMENT STRATEGIES

Multi-benefit Approach

Strategies were selected based on their ability to address multiple pollutants in addition to bacteria, and their potential to provide other benefits such as habitat, water resources, aesthetic, air quality, downstream stream integrity, and flood/drainage benefits.

Once the goals have been set, the Participating Agencies must develop strategies to meet the goals. As with the goals, each jurisdiction has developed its own strategies that will be implemented to work toward its goals. The Participating Agencies have also developed optional watershed strategies that, if needed, would be implemented through coordination amongst the Participating Agencies. The jurisdictional strategies for each participating agency are presented in the tables in Appendix A.

3.3.1 *LINK BETWEEN GOALS AND STRATEGIES*

The strategies are generally broad in nature and include suites of programmatic (a.k.a. non-structural) and structural BMPs that are expected to improve conditions within the watershed. The majority of the strategies selected are multi-benefit in nature, addressing multiple pollutants, beyond bacteria. As an example, a goal may call for reduction of bacteria loads at storm drain outfalls in order to meet the interim, and then the final TMDL requirements. Strategies that could be implemented to achieve this goal may include programs for illicit discharge identification, reporting and enforcement; approaches to address impacts of septic systems and sanitary sewers; designating and requiring BMPs for construction projects; addressing impacts of irrigation runoff; implementing or improving pet waste and trash management programs. Additionally, targeting key issues in residential areas could include homeowner's association collaborations,

Non-Structural Strategies Management actions or programs designed to address pollutant loading at the source.

Distributed Structural Strategies - Treatment or volume mitigation BMPs implemented at the neighborhood, parcel or site scale and designed to detain, retain, filter, remove, or prevent the release of pollutants to receiving waters.

Regional Structural Strategies - Treatment or volume mitigation BMPs implemented to treat stormwater from sub-watershed or catchment scale drainage areas.

outreach tasks and materials consisting of mailing lists, door-to-door handouts and promoting water conservation rebates. While each of these example strategies would help reduce multiple pollutants, they would all reduce bacteria loading to the storm water conveyance system and thereby improve conditions within the watershed. Section 3.3.5.4 provides quantification of these strategies and compares them to the target load reduction needed to meet Permit requirements.

Green BMPs (or Green Infrastructure) are defined as distributed or centralized/regional stormwater control measures that utilize natural treatment processes that emphasize infiltration, capture and use, and biofiltration, thereby addressing nearly all pollutants. Green BMPs may provide flood/drainage, habitat, water resources, aesthetic, air quality, and downstream stream integrity benefits. Typical types of Green BMPs include, but are not limited to bioretention and biofilters, green streets, rain gardens, infiltration trenches and swales, pocket parks and wetland systems.

3.3.2 *DESCRIPTION OF STRATEGIES*

The Permit establishes that WQIP strategies should be identified based on their likelihood to "effectively prohibit non-stormwater discharges to the stormwater conveyance system, reduce pollutants in storm water discharges from the stormwater conveyance system to the maximum extent practicable, protect the beneficial uses of receiving water from storm drain discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a" [B.3.b].

Water quality improvement strategies selected for this WQIP may be categorized as either non-structural, or structural BMPs (including both distributed and regional green BMPs). Non-structural BMPs can be municipal programmatic or regulatory measures, public education and outreach, financial incentives, or other management programs designed to effect behavioral changes. Distributed structural green BMPs include features such as rainwater harvesting and Low Impact Development-type solutions. Regional structural BMPs include large-scale bioretention systems and treatment wetlands (see appendices D and E).

This WQIP prioritizes non-structural BMPs for early implementation, with emphasis on those which most directly address risks to human health. Source control measures will also be aggressively implemented early on to address dry weather compliance goals to reduce all non-permitted non-stormwater discharges. Dry weather load reductions associated with the dry weather compliance goals are further discussed in Appendix E. Wet weather load reductions will be achieved through implementation of both non-structural and structural BMPs.

Within this larger framework, criteria for strategy selection include:

- BMP effectiveness for reduction of bacteria and priority water quality conditions;
- Provision of multiple benefits, including but not limited to habitat, recreation, economic, and water resources benefits; and
- The degree to which the strategy is sustainable, implementable, and cost-effective.

Potential non-structural and structural BMP strategies were identified in Section 2.5 of this WQIP. The following subsections describe the specific strategies within each of these categories that are being proposed for implementation.

3.3.3 *JURISDICTIONAL STRATEGIES*

The Participating Agencies have identified jurisdictional strategies that will be implemented as part of their Jurisdictional Runoff Management Programs (JRMP) that are designed to effectively prohibit non-stormwater discharges to the stormwater conveyance system, reduce pollutants in stormwater, and protect beneficial uses of receiving waters. Achievement of these outcomes will ultimately be measured against the interim and final numeric goals as discussed in Section 3.2. The jurisdictional strategies are detailed further in Appendix A.

The jurisdictional strategies can be categorized into three types:

- Strategies building on the required JRMP elements in Provision E of the Permit. These include the JRMP requirements as well as modifications and enhancements within the program elements to provide a more focused approach specifically addressing bacteria;
- Optional jurisdictional strategies that may be implemented to achieve the interim and final goals; and
- Coordinated strategies involving cooperation between multiple agencies working towards the common goals within the watershed.

3.3.3.1 Jurisdictional Runoff Management Plan (JRMP) Approach

Under the Stormwater Permit, four primary jurisdictional programs are required to be included in each participating agency's JRMP. Each program is required to have its own inventory of sources. The four primary programs are:

- Illicit Discharge Detection and Elimination (stormwater outfall inventory) [D.2];
- Development Planning (Priority Development Project and BMP inventory) [E.3];
- Construction Management (Construction site inventory) [E.4]; and
- Existing Development Management (Industrial, Commercial, Municipal, Residential inventories) [E.5].

The Participating Agencies have identified known and suspected sources contributing to bacteria loading and BMPs to address the sources of bacteria in Provision B.2. These known and suspected sources include storm drain outfalls with persistent (non-stormwater or dry weather) flow and certain land use activities. The number of outfalls in each participating agency's jurisdiction with persistent flow is included in Table 15. The numbers of pollutant generating facilities, areas, and activities associated with the construction and existing development inventories for each jurisdiction are presented in Table 16.

Table 15. Number of Copermittee Stormwater Outfalls with Persistent Non-Stormwater Flow

Jurisdiction	Persistent Outfalls[a]
City of El Cajon	3
City of La Mesa	8
City of Santee	13
City of San Diego	86
County of San Diego	9

[a] Persistent flow is defined in the Permit as: "the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient."

Table 16. Pollutant Generating Facilities, Areas, and/or Activities

Land Use	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Construction Sites	288	247	14	28	12
Commercial Sites	493	3,703	540	342	700
Industrial Sites	79		N/A	17	104
Municipal Sites	40	57	17	49	34
Parks/Recreational Areas	25	67	279 acres	--	78 acres

Nonstructural BMPs that will be implemented to address bacteria include those required by Provision E of the Permit. Some of these programs are new, required under the most recent Permit, while others are existing programs that have been implemented by the participating agencies for many years. Additional strategies and BMPs have been developed to complement the existing Permit requirements for JRMPs. The Participating Agencies have also included suggestions received by the public at workshops.

The following subsections and tables describe the potential sources of bacteria and the strategies and BMPs that the Participating Agencies will employ through their JRMP to address bacteria and other pollutants and associated sources within the watershed. Each jurisdiction will take specific actions to implement the strategies. These actions, included in Appendix A, provide a bridge from the planning level strategies developed in the Water Quality Improvement Plan to each jurisdiction's JRMP. For a full description of the non-structural BMPs, including specific policies and procedures, the reader is referred to the JRMP documents for each jurisdiction that are concurrently being developed with the WQIP.

Caltrans' jurisdiction areas include roadways, land adjacent to roadways, and facilities; Caltrans' jurisdictional strategies specifically focus on BMP implementation to reduce known pollutants within these areas. Caltrans is not a party to the regional Permit; however, Caltrans is subject to TMDL requirements through its statewide Permit (SWRCB, 2013). Caltrans' strategies vary from those of other Responsible Agencies (in both type and name) to best address typical discharges from its jurisdictional areas. Strategies include programs being implemented by both Caltrans

Headquarters for statewide execution and District 11 for local implementation; implementation of these strategies within the San Diego River Watershed is dependent on state funding. Caltrans has voluntarily contributed to the Water Quality Improvement Plan effort to provide a consistent approach to meeting applicable Draft Sediment TMDL and Bacteria TMDL requirements. The strategies developed will be implemented as resources are available.

For Bacteria TMDLs, Caltrans is expected to eliminate dry weather flows by implementing control measures to ensure effective prohibition (Provision B.2 of the Permit). For wet weather flows, Caltrans is expected to implement control measures/BMPs to prevent discharge of bacteria from its ROW; this can be source control and preemptive activities such as street sweeping, clean-up of illegal dumping and public education on littering. Implementation of these controls is per their TMDL prioritization list. For more information related to the Caltrans stormwater program, the reader should refer to their Stormwater Management Plan (July 2012).

3.3.3.2 Illicit Discharge Detection and Elimination

Strategies to address bacteria loading developed by the Participating Agencies related to the Illicit Discharge Detection and Elimination (IDDE) Program are described in Table 17. While the focus is on bacteria, these strategies address multiple pollutant sources and constituents. For each strategy, the table identifies the agencies that will implement associated programs and what sources and pollutants will be addressed. Details on the jurisdictional programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies in which these programs will be implemented, are included in Appendix A.

Table 17. Jurisdictional Strategies Related to the Illicit Discharge Detection and Elimination Program

San Diego River Watershed Illicit Discharge Detection and Elimination Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2. Develop and implement approaches to address the impacts of septic systems within the watershed.	●	●			●											
3. Develop and implement approaches to address the impacts of homeless activities within the watershed.	●	●		●								●	●	●		
4. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
5. Implement monitoring programs to provide new information to refine the prioritization of drainage areas.	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
6. Actively educate public on prohibitions related to illicit discharges and connections.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

3.3.3.3 Development Planning

Previous Stormwater permits in 2001 and in 2007 designated specific types of new development and redevelopment projects as "priority development projects" or PDPs, requiring specific site design, source control, and structural treatment control BMPs to be implemented for qualifying projects. The 2007 Stormwater Permit also required certain PDPs to implement controls to mitigate increases in peak flow and volumes of stormwater. With the 2013 Stormwater Permit, these requirements were further intensified with the new requirement for full on-site retention of the 24-hour 85th percentile storm volume. With limited exceptions, new development and redevelopment projects are required to *retain* stormwater and its associated pollutants (including bacteria) on-site, to reduce the impacts on receiving waters during storm events. In most cases, the post-construction BMPs are also designed to intercept and infiltrate dry weather flows, providing significant pollutant reduction, and often full elimination under ambient conditions.

Priority Development Projects (PDPs) are new development and redevelopment projects that create, add, or replace large areas of impervious surfaces and are subject to stormwater retention and hydromodification requirements, in addition to the source control and treatment control requirements for all projects.

Projects that meet the following conditions are classified as PDPs:

- Residential development: new development creating 10,000 square feet of impervious surfaces or redevelopment creating/replacing 5,000 square feet or more;
- Commercial developments: new development creating 10,000 square feet of impervious surfaces or redevelopment creating/replacing 5,000 square feet or more;
- Parking lots with 5,000 square feet or more of impervious surface; and
- Streets, roads, highways, and freeways with 5,000 square feet or more of impervious surface.

The implementation of baseline permit requirements for new development and redevelopment projects will mitigate pollutants (including bacteria and other priority water quality conditions) and ensure that these projects do not cause degraded water quality conditions downstream of the project site.

Participating Agencies will implement permit requirements, aligned outreach and training programs, and are considering the potential for an alternative compliance program (further discussed in Section 3.4). These elements make up the strategies for the Development Planning element of the programs. The strategies developed to implement the Development Planning Program, focusing on bacteria where applicable, are included in Table 18. The table includes the strategies to be implemented by the Participating Agencies and the sources and pollutants that will be addressed. Details describing the programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies that these programs will be implemented, are included in Appendix A.

Table 18. Jurisdictional Strategies Related to the Development Planning Program

San Diego River Watershed Development Planning Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
2. Develop and implement LID programs to complement standard permit requirements.	•		•	•			•	•	•	•		•	•	•		
3. Implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation and identify a list of candidate projects that could be used as alternative compliance options for Priority Development Projects.	•	•	•	•	•		•	•	•	•		•	•	•	•	•
4. Consider development of an alternative compliance program for Priority Development Projects.	•	•	•	•	•		•	•	•	•		•	•	•	•	•
5. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
6. Enforce post construction requirements related to new and redevelopment.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•

3.3.3.4 Construction Management

Based on the evaluations performed in the Long Term Effectiveness Assessment[3], construction sites are unlikely to be a significant source of bacteria loading. However, there are particular sources and/or activities on construction sites that have the potential to general bacteria including vehicle equipment, maintenance, and repair, portable toilets, and waste storage/handling (i.e., trash).

The participating agencies have been implementing construction stormwater programs for several permit terms. Over this time, agency staff and the construction community have become well trained in construction stormwater management. Additional oversight is required per the State Construction General Permit (Order 2009-0009-DWQ) for sites greater than one acre. With this amount of focus, the limited sources of bacteria related to construction are well addressed via the existing permit requirements. For this reason, the Participating Agencies will focus on the baseline programs as required under the 2013 Stormwater Permit.

Table 19 summarizes the various strategies developed to implement the Construction Program, focusing on bacteria where possible. The table includes the strategies to be implemented by the Participating Agencies and the sources and pollutants that will be addressed. Details describing the programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies in which these programs will be implemented, are included in Appendix A.

[3] The San Diego Stormwater Copermittees, Urban Runoff Management Programs, "2011 Long-Term Effectiveness Assessment", available on the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=184%3Along-term-effectiveness-assessment&catid=16&Itemid=91

Table 19. Jurisdictional Strategies Related to the Construction Management Program

San Diego River Watershed Construction Management Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Ensure that minimum BMPs are designated and required for construction projects.	•	•	•	•	•	•					•	•	•	•		
2. Provide enhanced outreach and coordination to convey construction requirements.	•	•	•	•	•	•					•	•	•	•		

3.3.3.5 Existing Development Management

The Existing Development Management Program addresses a variety of sources including commercial/industrial, residential, and municipal areas and activities. The distribution of baseline bacteria loads within the lower watershed by Participating Agency is illustrated in Figure 4. A majority of the land uses within the lower watershed are regulated under the Existing Development Management Program. For the purposes of the baseline loading analysis, as well as subsequent BMP implementation analyses presented in this WQIP, land use loads attributable to federal and tribal land ownership are not considered part of the Participating Agencies' load since the Participating Agencies do not have jurisdiction over these lands. Similarly, loading from agricultural land uses is not considered part of the Participating Agencies' load because the TMDL identifies Conditional Waivers of Waste Discharge Requirements as the mechanism to address discharges from controllable non-point sources (SDRWQCB 2010, p. A47). Open space loading is also shown as a separate category here, consistent with the TMDL. However, it should be noted that this general land use category includes parks and other undeveloped areas that are located within the Participating Agencies' jurisdictional areas and that drain to or through the stormwater conveyance system.

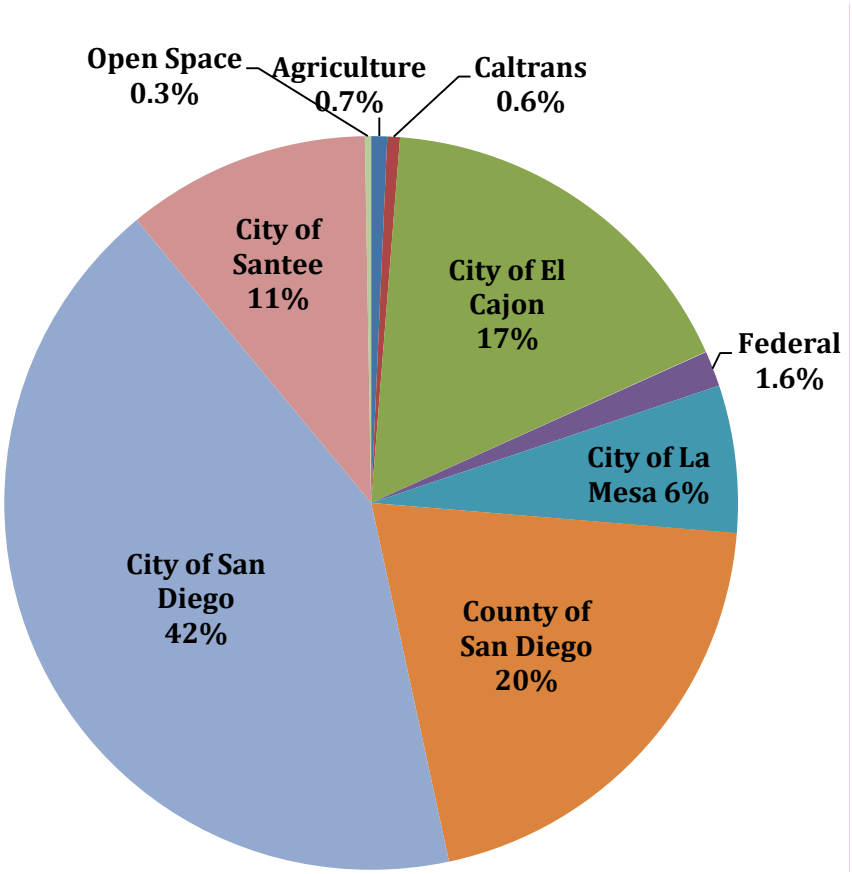

Figure 4. Wet Weather FC Modeled Loads in the San Diego River Watershed by Land Use/ Jurisdictional Category, Water Year 2003.

Using experience gained through the implementation of the Existing Development Management Program, Participating Agencies identified strategies which will address bacteria within their jurisdictions. These strategies build on existing programs established during previous Permit cycles.

Table 20 summarizes the various strategies to be implemented within the Existing Development Management Program to focus on bacteria. The table includes the strategies to be implemented by the Participating Agencies and the sources and pollutants that will be addressed. Details describing the programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies that these programs will be implemented, are included in Appendix A.

Table 20. Jurisdictional Strategies Related to the Existing Development Management Program

San Diego River Watershed Existing Development Management Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Maintain and improve data tracking methods for existing development inventories where necessary.	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●
2. Develop and implement approaches to address the impacts of improper water use and irrigation runoff.	●	●	●	●	●		●	●	●	●		●	●	●	●	
3. Improve and/or continue existing pet waste programs.	●	●	●	●	●		●	●				●	●	●		
4. Improve trash management strategies within the watershed.	●	●	●	●	●	●	●	●	●	●		●				
5. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.	●	●	●	●	●		●	●	●	●		●	●	●		
6. Improve and implement existing outreach programs to target key sources and pollutants.	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●
7. Enhance existing Stormwater maintenance programs.	●			●		●		●				●				
8. Develop and implement targeted programs to address issues in residential areas.	●	●	●	●	●		●					●	●	●	●	
9. Improve existing inspection programs to more efficiently target key sources.	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●

San Diego River Watershed Existing Development Management Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
10. Actively enforce stormwater and urban runoff requirements for existing development.	●	●	●	●	●		●	●	●	●		●	●	●	●	●
11. Identify and facilitate retrofit opportunities in areas of existing development.	●	●	●	●	●	●	●	●	●			●	●	●	●	
12. Perform strategic monitoring to improve understanding of sources and water quality within the watershed.					●		●	●	●	●		●	●	●	●	●
13. Improve coordination between agencies.	●	●		●	●		●	●				●	●	●		

3.3.3.6 Optional Jurisdictional Strategies

Optional jurisdictional strategies include those that agencies may implement if specific considerations are met to achieve interim and final numeric goals as defined by the water quality improvement plan. Implementation of the optional strategies will be contingent on circumstances supported by the need for the additional effort, the cost/benefit as compared to other options and strategies, and the availability of funding. Some optional strategies that may be implemented are included in Table 21.

Table 21. Optional Jurisdictional Strategies

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Support workgroup to provide sanitation and trash management for persons experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals. (IDDE)			•	•			The triggers the City must have to participate in this optional strategy include: 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	Funding needs have not been determined at this time.
Identify strategy, resources, and funding to support mapping and assessment of agricultural operations. (Existing Development)				•			Where progress towards interim or final goals is not significant and source investigations indicate that agricultural operations are a source of bacteria causing receiving water exceedances.	Funding needs have not been determined at this time.
Improve database and mapping capabilities for management of existing development. (Existing Development)				•			As funding sources for project are available.	Funding needs have not been determined at this time.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Coordinate with County of San Diego and identify resources and funding to implement a program to target on-site wastewater treatment (septic) systems. May include mapping and risk assessment, inspection, or maintenance practices. (Existing Development)							Where progress towards interim or final goals is not significant and source investigations indicate that on-site wastewater treatment systems are a source of bacteria causing receiving water exceedances.	Funding needs have not been determined at this time.
Conduct an assessment to determine if implementation an urban tree canopy (UTC) program would benefit water quality and other City goals. (Existing Development)			•				This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	Funding needs have not been determined at this time.
Conduct a feasibility study to test Permeable Friction Course (PFC), porous asphalt that overlays impermeable asphalt. (Development Planning, Existing Development)			•				This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	Funding needs have not been determined at this time.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
As opportunities arise and funding sources are identified, , protect areas that are functioning naturally by avoiding impervious development and degradation on unpaved open space areas, creating permanent open space protections on undeveloped city-owned land, and accepting privately-owned undeveloped open areas. (Development Planning, Existing Development)			•				This strategy may be implemented if there is interest in participation by the public or private entity with current control of the land. Conditions to be met also include 1) identification of partners, if needed (public, private, non-profit), 2) identification of costs and potential sources of funding, 3) final agreement by public or private entity with current control of the land, 4) final agreement by all other participating partners, 5) funding in place, and 6) if it can be determined that the benefit of preventing increased pollutant loads and minimizing impacts of future growth through land conservation is a more cost effective strategy to meet interim and final numeric goals than other recommended strategies included in this plan.	Variable depending on need.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Conduct a Sustainable Return on Investment (SROI) analysis to estimate strategies' co-benefits and impacts to the public and private sector on a common scale.			•				Perform a feasibility study to determine if implementing an UTC program would be beneficial to the City's goals. UTC intercepts rainfall through increased coverage of leaves, branches, and stems and reduces runoff from the storm drainage system. Benefits associated with enhancing an UTC include reducing heat island effects and air pollution in addition to aesthetics and community benefits. Where feasible, native trees will be utilized to prevent invasive trees from migrating to open spaces and to conserve water. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	Funding needs have not been determined at this time.
Create a fund that allows habitat acquisition, protection enhancement, and restoration in conjunction with other cooperating entities including community groups, academic institutions, state county, and federal agencies, etc.			•				This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	Funding needs have not been determined at this time.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Participate in a watershed council or group if one is established.			•				This strategy may be triggered as 1) partners have been identified and formal MOUs have been developed and 2) consensus and community support has been achieved.	Funding needs have not been determined at this time.
Implement additional trash segregation projects. (Existing Development)			•				Where progress towards interim or final goals is not significant and it is determined that additional strategies will be necessary to meet final goals.	Variable depending on type of project.
Increase collaboration between watershed stakeholders, regulators, managers, and researchers. (Development Planning)	•			•	•		Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Costs are depending on results of WMAA; funding sources have not been identified at this time.
Consider Alternative Compliance Program for Land Development – potential to address retrofits and rehabilitation (Development Planning)	•		•	•	•		Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Costs have not been quantified but would include costs for program development, administration, and transactions. A source of funding has not been identified.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Consider Green Street Retrofits or other small-scale retention or infiltration controls (Existing Development)	•	•	•	•	•	•	Where progress towards interim or final goals is not significant and watershed analysis indicates the need for distributed BMPs to attain the final goals, green streets will be considered where funding is available.	Project Dependent and contingent on need and adequate funding.
Investigate opportunities for restoration on Forester Creek, Wood Glen Vista Creek, and Sycamore Creek				•			Where progress towards final goals is not significant and watershed analysis indicates the need for additional structural BMPs to attain the final goals, structural options will be considered where funding is available.	
Consider distributed and/or Regional Structural BMPs (e.g., detention basins, treatment systems)	•	•	•	•	•	•	Where progress towards final goals is not significant and watershed analysis indicates the need for additional structural BMPs to attain the final goals, structural options will be considered where funding is available.	Project Dependent and contingent on need and adequate funding.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Consider dry Weather Flow Diversions	•	•	•	•	•	•	Where progress towards interim or final dry weather goals is not significant and watershed analysis indicates the need for additional BMPs to attain the final goals, dry weather diversions may be considered where funding is available.	Project Dependent and contingent on need and adequate funding.
Consider retrofit projects in areas of existing development	•	•	•	•	•	•	Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Project Dependent and contingent on need and adequate funding.
Consider stream, channel, and/or habitat rehabilitation projects	•	•	•	•	•	•	Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Project Dependent and contingent on need and adequate funding.
Consider groundwater characterization study		•					Where results of stormwater outfall monitoring indicated that groundwater is a contributing source of persistent flows and funding is available.	Project Dependent and contingent on need and adequate funding.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Investigate public-private partnership incentives program to encourage installation of structural BMPs on existing development					•		Dependent on the availability of opportunities for retrofits	Seek grant support and collaborations with non-government and other agencies

The decision to implement one or more optional strategies will be determined though the adaptive management process. As part of the adaptive management process, progress towards interim and final goals will be assessed annually, and once every five years, as part of the Report of Waste Discharge (ROWD); the ROWD assessment process will consider:

- progress towards interim and final goals,
- implementation status of the strategies and BMPs,
- the appropriateness of the numeric goal(s), and
- the proximity (i.e., timeframe) of the final goal(s).

The ROWD assessment will aid the adaptive management process. Where the assessments indicate that the goals are appropriate and significant progress has not been achieved by the strategies and BMPs implemented, the Participating Agencies will update the watershed analysis with the most recent information available to determine whether the final goal can be met through continued implementation of the WQIP as it is. If the results are affirmative, the Participating Agencies will continue implementing the WQIP as planned. Where significant progress has not been achieved, the final goal has been determined appropriate, and is within the near term (e.g., 5- 10 years), the Participating Agencies will move forward to implement select optional strategies based on available funding as necessary to meet the goal. The flexibility of the adaptive management process will allow each jurisdiction to adjust WQIP implementation to maximize their ability to achieve the goals.

3.3.3.7 Optional Watershed Management Area Strategies

Agencies have identified multiple coordinated efforts to be implemented within the San Diego River Watershed. Several of these are included in the jurisdictional programs supporting the watershed strategies, while others are included as optional strategies. These coordinated efforts are summarized in Table 22.

Table 22. Optional Watershed Management Area Strategies

Strategy and Program	Lead Agency	Cooperating Agencies	Optional Strategy	Implementation Timeframe
Increase collaboration between watershed stakeholders, regulators, managers, and researchers	City of El Cajon	City of Santee	Yes	To be determined; dependent on outcomes of WMAA
Regional workgroup to provide sanitation and trash management for persons experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	None designated	City of San Diego, City of Santee	Yes	To be determined; dependent on establishment of workgroup.
Coordinate with County of San Diego and identify resources and funding to implement a program to target on-site wastewater treatment (septic) systems. May include mapping and risk assessment, inspection, or maintenance practices.	None designated	County of San Diego	Yes	To be determined; dependent on assessments, investigations, and available funding.

3.3.4 *QUANTIFICATION OF DRY WEATHER STRATEGIES*

Dry weather load reductions were calculated using a tiered approach to demonstrate reasonable assurance that the strategies will achieve compliance. First, the quantifiable nonstructural BMP load reductions were estimated then the gap between these aggressive source control programs and the TMDL required reduction level was filled using dry weather structural solutions when necessary.

The dry weather load reduction quantification approach involves similar steps for the suite of dry weather nonstructural BMPs included in this WQIP (including irrigation runoff reduction and commercial/industrial good housekeeping). The first step was to calculate the load generated by the targeted pollutant source that the BMP will address, by using a percentage of the total Participating Agency pollutant baseline load[4] which was taken from source tracking studies. Once the targeted pollutant source load was calculated, the potential load reduction benefit was calculated using the estimated effectiveness of the selected BMP. These values were based on literature when available, and if not, on best professional judgment. In both cases, predicted levels of uncertainty are high. The following sections provide a brief description of the specific quantification approach for each dry weather nonstructural BMP, along with relevant assumptions and assumption explanations.

Additionally, some dry weather structural controls may also be implemented to achieve the TMDL required reduction levels. Dry weather structural BMPs may include but are not limited to: low flow diversions to sewers, storm drain lining, catch basin dry wells, street gutter permeable pavement, bioretention swales, and regional BMPs.

Dry weather goals are discussed further in section 3.3.6.3

3.3.5 *WET WEATHER STRUCTURAL STRATEGIES*

Provision 6.b.(3).(f).(ii) of Attachment E of the Permit references an analysis that utilizes a watershed model or other analytical tools to demonstrate that the implementation of the WQIP would meet the established goals. This analysis, which is required for this compliance demonstration, is referred to herein as the BMP benefits quantification. This section describes the methodology used to conduct the BMP benefits quantification. It presents the results of the analysis, which demonstrate that the proposed jurisdictional strategies and watershed strategies meet the WQIP goals. Not only does this analysis show compliance with the Permit, and it also offers the following.

1. It gives the Participating Agencies a defensible basis for the number, type, size, location, and phasing of the strategies/BMPs identified.

[4] The baseline load was assumed to be proportional to the flow (i.e. if x% of the flow was from irrigation runoff than, x% of the load was from irrigation runoff).

2. It gives the Regional Board confidence in the WQIP strategies that the Participating Agencies have proposed (increasing likelihood of WQIP approval).
3. It is a flexible tool that can accommodate the WQIP's future adaptive management process – i.e., models can be improved with future monitoring data, and the list of strategies/BMPs can be updated accordingly as a result.
4. If desired, alternative regulatory scenarios can be evaluated using the models – for example, how implementation costs change as a result of a potential TMDL reopener outcome.

The overall WQIP approach will be to prioritize early implementation of non-structural BMPs. The structural BMP controls are designed to address wet weather flows. As required in the Attachment E of the Permit, the structural BMPs proposed in the WQIP are equivalent to the suite of BMPs proposed in the SDR CLRP.

As with other optional strategies, structural BMPs would be implemented as needed and as funding is available by the individual entities, organizations, or Participating Agencies. The WQIP does not oblige the Participating agencies to construct the measures but identifies those that may be effective in attenuating pollutant loading to meet final numeric goals.

Outside the City of San Diego, locations for proposed distributed and regional structural BMPs were identified using the U.S. Environmental Protection Agency model SWMM-based, Structural BMP Prioritization and Analysis Tool (SBPAT). The SBPAT was used to prioritize catchments within the watershed based on their potential to generate the highest pollutant loads during wet weather events. This allows identification of locations within the watershed that offer the greatest potential benefits in terms of load reductions through implementation of BMPs. Consistent with the objective of prioritizing strategies with a multi-pollutant benefit, this catchment prioritization analysis was conducted to consider nitrogen and phosphorus in addition to bacteria, the HPWQC.

Within the City of San Diego a similar process was used to identify and prioritize locations for distributed and regional BMPs; however, the City of San Diego used the System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN) during the assessment process.

Appendix B provides a detailed description of how the wet weather baseline loads were determined, and appendix D provides a description of wet weather structural BMP load reduction calculations and methods.

3.3.5.1 Implemented Distributed Structural BMPs

Baseline loads in the WQIP included loads from development that occurred between the TMDL year (2003) and 2009, since the WQIP baseline load was developed using 2009 land use data. As such, structural BMPs that were implemented between the TMDL year (2003) and 2009 as mitigation to this anticipated development were considered as part of the overall pollutant load reduction to be achieved by the WQIP. Appendix D presents a list of these projects and a map with their locations is shown in Figure 5 and the load reductions are summarized in Table 23.

No credit is given in the WQIP for BMPs to be implemented as mitigation to new development after 2009 as it is assumed that the loads mitigated by the BMPs will offset the additional loads

generated by new development (i.e. no net decrease in pollutant load). Refer to Appendix B where the role of implemented structural BMPs in the WQIP's baseline load calculations is discussed.

Table 23. Estimated Load Reductions from Distributed BMPs

Distributed BMPs	Water Quality (FC Load) Benefits (10^12 MPN reduction/year) [Low – High]
Implemented Distributed Projects	53 [29 – 62]
Potential Distributed Projects	397 [214 – 463]

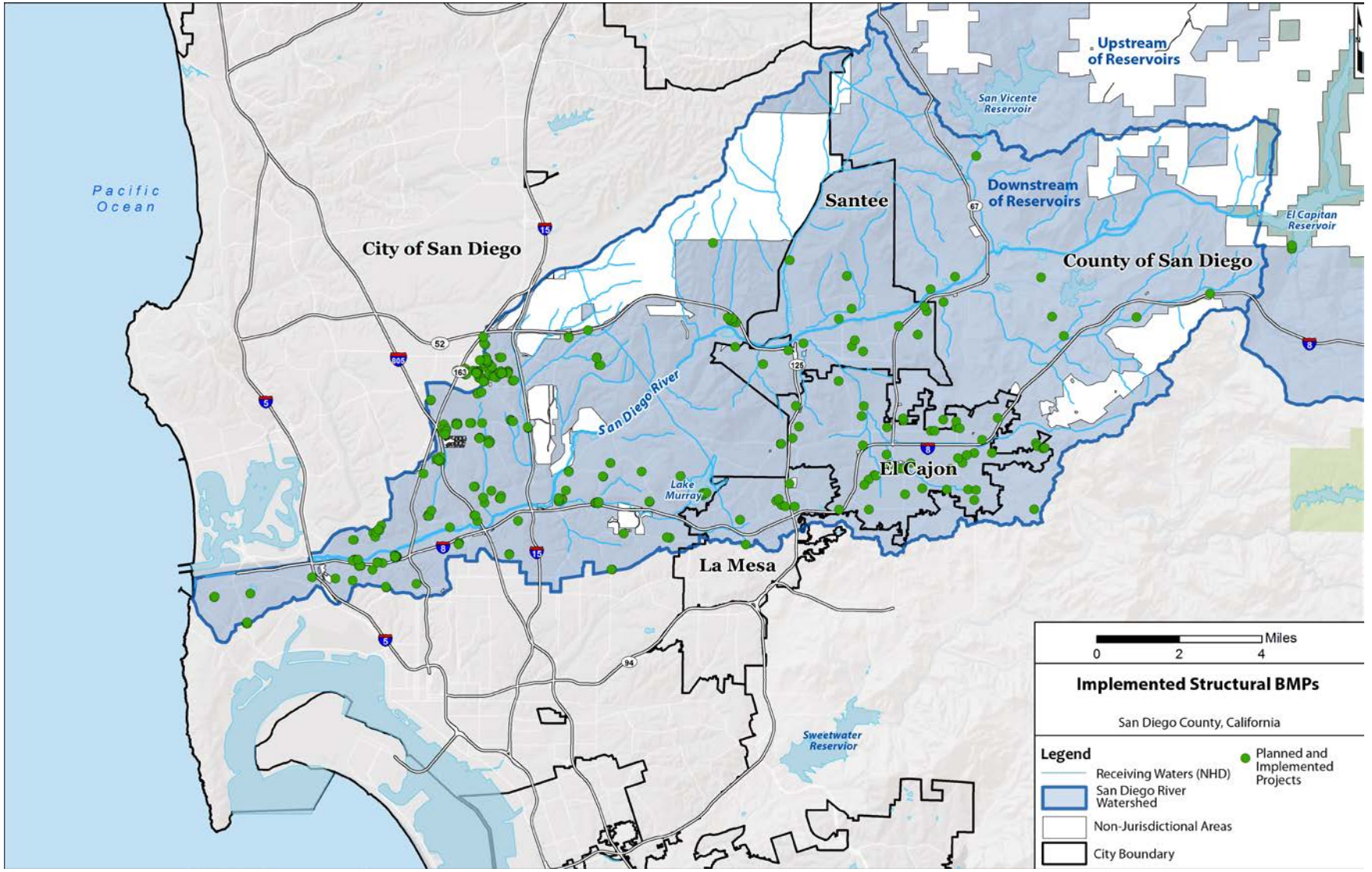

Figure 5. San Diego River Watershed Implemented Structural BMPs

3.3.5.2 Proposed Distributed Structural BMPs

Distributed structural BMPs would be implemented as needed by the individual Participating Agencies. Determination of need will be based on modeling and the adaptive management process described above and using the ROWD assessment process.

To determine appropriate locations for distributed structural BMPs, the San Diego River watershed catchments were analyzed to determine their potential to contribute to pollutant loads, and those with the greatest potential were selected to focus BMP efforts. These focused catchments were further screened for potential distributed BMP opportunities. The catchments where implementation of proposed distributed BMPs would offer the greatest load-reduction are shown in Figures 6. The methodology for selection of BMP types and locations is detailed in Appendix D.

Table 24. Water Quality Benefits from Proposed Distributed Structural BMPs[a]

BMP Type	FIB-FC load reduction % of Average Municipal Land Use Load)
	Average [Low-High]
Potential Public Private Partnership Program	8.5% [1.6% - 15%]
Redevelopment through Permit-Required LID Implementation	4.3% [3.4% - 5.1%]
Implemented Projects	1.1% [0.6% - 1.3%]
Future Projects	8.6% [4.6% - 10%]

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

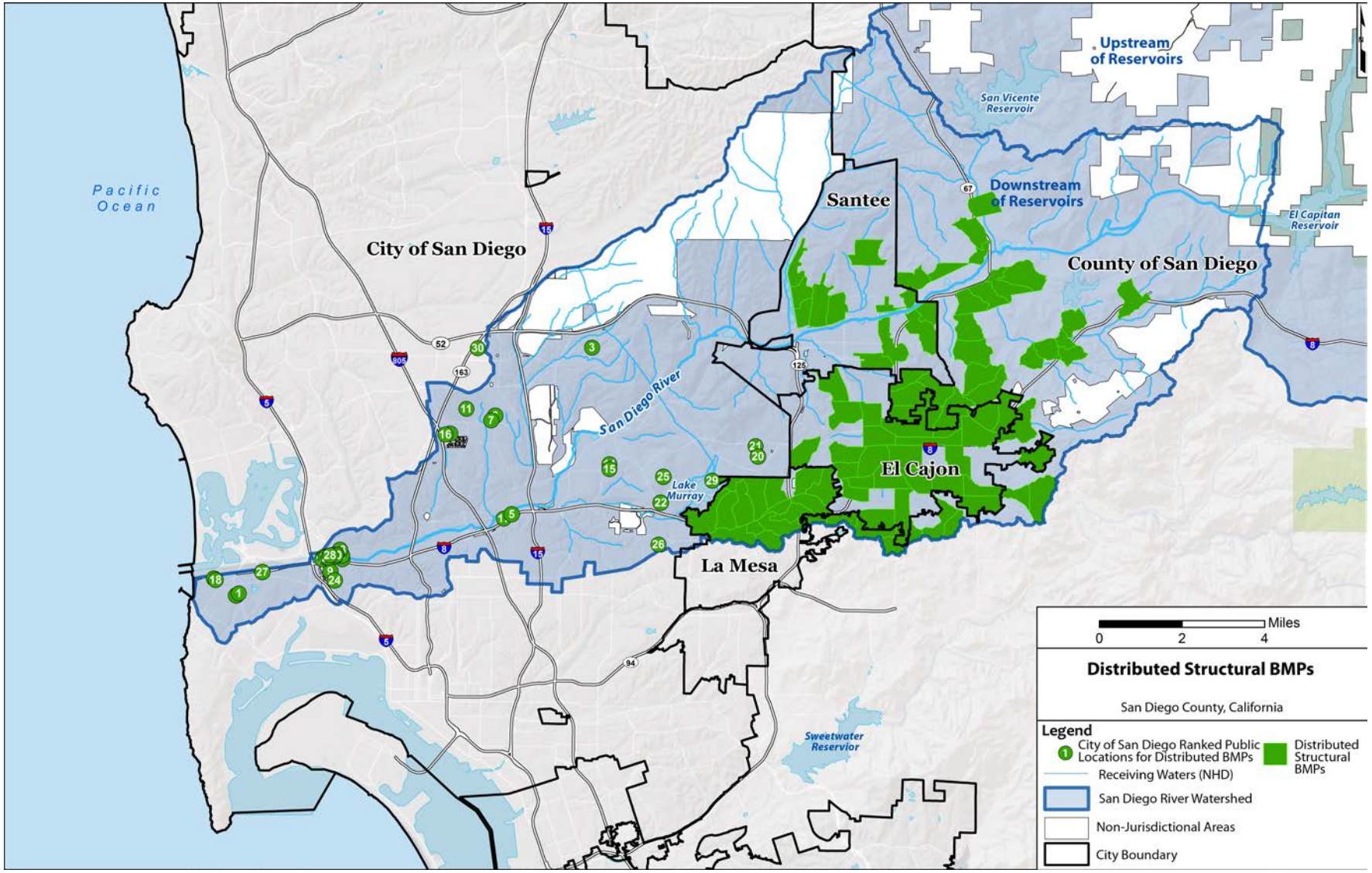

Figure 6. Proposed Catchments for Implementation of Distributed Structural BMPs

3.3.5.3 Proposed Regional Structural BMPs

As with distributed structural BMPs, regional structural BMPs would be implemented as needed and as funding is available by the individual Participating Agencies. The determination of need will be based on the adaptive management process and using the ROWD assessment process. The WQIP does not oblige the Participating agencies to construct the measures but identifies those that may be effective in attenuating pollutant loading to meet target objectives.

Using SBPAT and LSPC/Sustain, potential locations for regional structural BMPs were determined by identifying catchments located downstream of multiple, hydrologically linked catchments that have high pollutant loads. Within these catchments, appropriate sites were selected and, based on each site's physical characteristics, site specific BMPs were selected. The locations of proposed regional BMPs are shown in Figure 7 and summarized below in Table 25.

Table 25. Estimated Load Reductions from Regional BMPs

Location/Name	Water Quality (FIB-FC Load) Benefits (10^12 MPN reduction/year)
	WY 2003 [Low - High]
SDCo-R-01	128 [92 - 145]
SDCo-R-02	14 [10 - 16]
SDCo-R-03	55 [33 - 64]
CoS-R-01	20 [11 - 24]
CoS-R-02	6 [4 - 7]
MJ-R-01	166 [77 - 198]
MJ-R-02	36 [21 - 42]
Totals	425 [247 - 496]

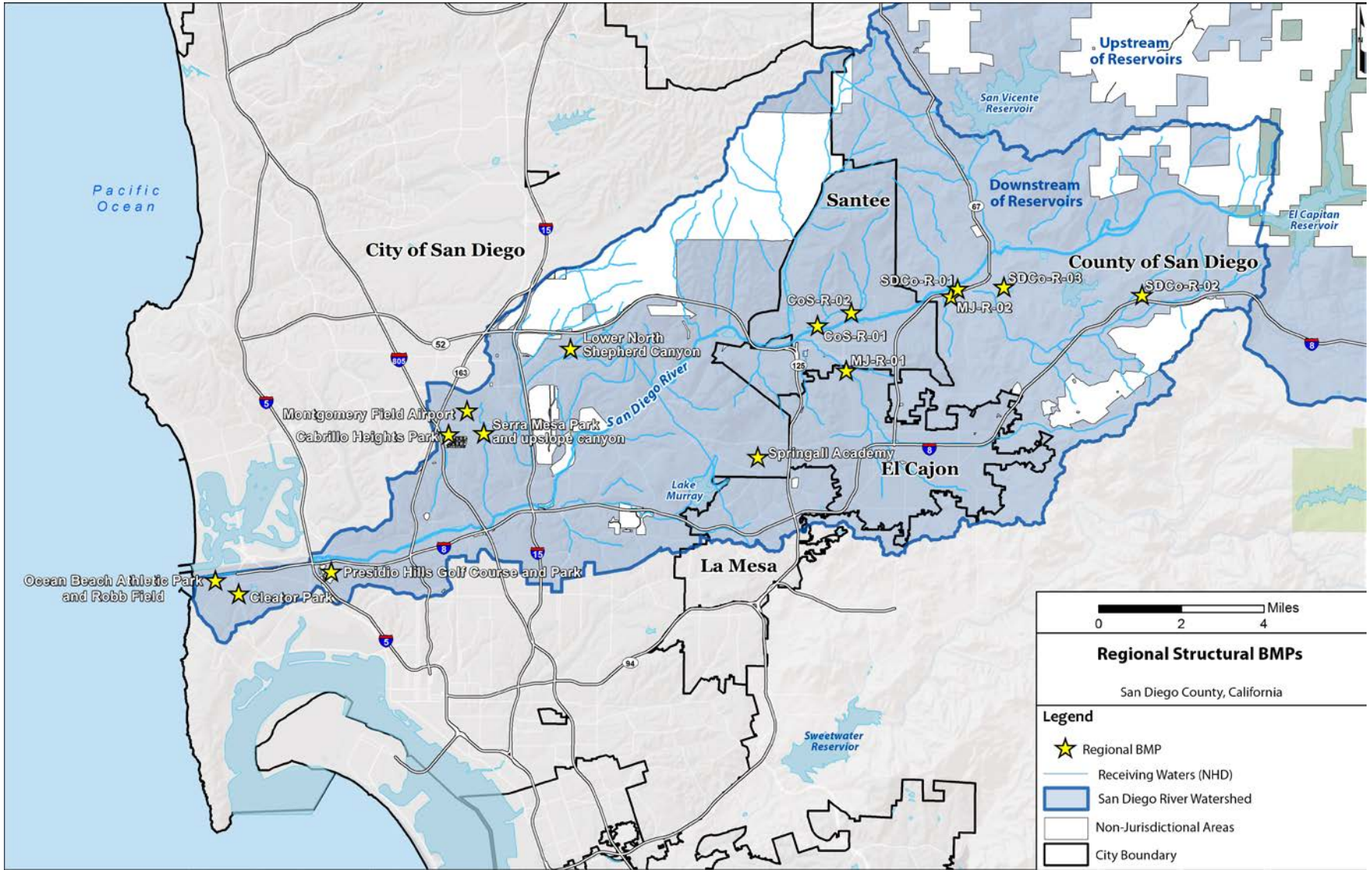

Figure 7. Locations of Proposed Regional Structural BMPs

3.3.5.4 Stream Restoration/Enhancement Projects

Stream restoration/enhancement projects that were implemented after 2003 to add or replace impacted habitat with habitat having similar functions of equal or greater ecological value within the San Diego River Watershed were given load reduction credit as these projects treat stormwater that comes in contact with enhanced and/or created vegetation.

Stream Restoration/Enhancement projects include the following:

- Forester Creek
- Woodglen Vista Creek
- Las Colinas Channel (future proposed project)
- Alvarado Channel Restoration (future proposed project)

Locations of stream restoration projects are shown in Figure 8, load reductions summarized in Table 26, and discussed further in Appendix D.

Table 26. Estimated Load Reductions from Stream Enhancement/Restoration Projects

Location/Name	Water Quality (FIB-FC Load) Benefits (10^12 MPN reduction/year)
Forester Creek	55 [13 - 96]
Woodglen Vista Creek	4 [1 - 6]
Las Colinas Channel	2 [0 - 3]
Alvarado Channel Restoration	6 [2 - 11]
Totals	67 [16 - 117]

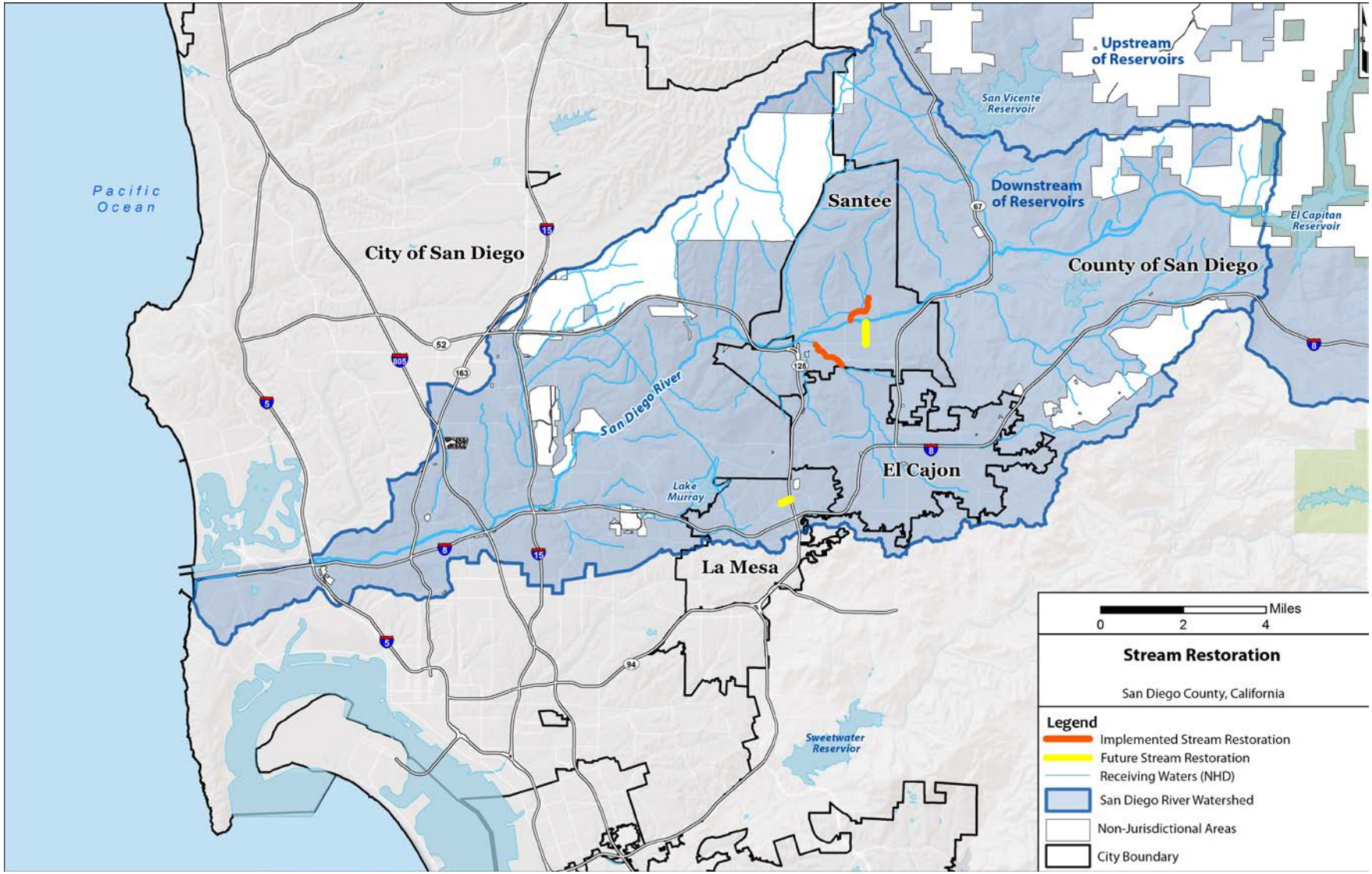

Figure 8. Stream Restoration Projects for San Diego River Watershed

3.3.6 *BMP BENEFITS QUANTIFICATION METHODOLOGY*

In order to assess the ability of the proposed jurisdictional strategies (Section 3.3.2), watershed management area strategies (Section 3.3.3), and structural strategies (Section 3.3.4) to achieve WQIP numeric goals, load reductions expected to result from the implementation of these strategies were estimated for wet weather and dry weather. The processes by which load reductions were estimated for wet weather BMPs (public-private partnership programs only), structural wet weather BMPs, and dry weather non-structural and structural BMPS are described in Appendices C, D, and E, respectively.

3.3.6.1 Wet Weather Non-Structural BMPs

A distinction must be made between those with sufficient available data to be modeled (the public-private partnership programs) and those that cannot be modeled due to limited data. The methodology used to quantify the benefits achieved by public-private partnership programs (i.e., LID incentive programs, redevelopment and LID implementation) was as follows:

1. Identify the source(s) addressed by the BMP;
2. Calculate the source(s) area that will be addressed by the BMP;
3. Estimate the effectiveness of the BMP at reducing the load generated by the source(s); and
4. Calculate the BMP pollutant load reduction benefit from the information obtained in Step 2 and Step 3.

Due to limited data quantifying their effectiveness, wet weather bacteria load reductions of potential BMPs identified in Provision B.2, section 2.5.1 are not as readily modeled, including:

- Identification and control of sewage discharge to Copermittee stormwater systems,
- Trash cleanups,
- Onsite wastewater treatment source reduction,
- Good landscaping practices, including use of drip irrigation and SMART irrigation controllers
- Commercial/industrial good housekeeping,
- Pet waste controls,
- Animal facilities management,
- Erosion monitoring and repair,
- Stormwater catch basin and channel cleaning,
- Street and median cleaning, and
- Education and outreach.

To account for the expected pollutant load reduction from these other non-modeled, non-structural BMPs, an additional ten percent reduction is initially included in the quantification. The inclusion of these other non-structural BMPs or programmatic BMPs in the WQIP and their assumed ten percent load reduction could be evaluated and updated throughout the implementation period as pollutant loading and BMP performance data is collected.

The City of San Diego was able to model non-structural BMPs using SUSTAIN. This process is described in Appendix D.

The quantification of the load reduction for non-structural BMPs currently being implemented by Caltrans followed a similar approach and is included in Appendix D.

3.3.6.2 Wet Weather Structural BMPs

To identify a program of activities that will be capable of achieving TMDL-required bacteria load reductions, the Participating Agencies used a robust computer model with the ability to simulate hydrologic and pollutant loadings and to evaluate various BMP implementation scenarios. The water quality model was used to estimate the bacteria load reductions predicted to achieve compliance under various BMP implementation scenarios.

The WQIP identifies a suite of potential non-structural and structural BMPs. The WQIP does not oblige the Participating Agencies to construct the measures, but identifies those that may be effective in reducing pollutant loading to reach final numeric goals. BMPs were identified based on their cost and potential effectiveness in reducing pollutant loading in the watershed, with the goal of achieving estimated target load reductions for wet and dry weather. For the structural BMPs proposed in this WQIP for the, load reductions during wet weather were calculated using SBPAT as described in Appendix D. In general, design criteria for each selected BMP were first defined considering site constraints (in particular, acreage available for each BMP footprint), BMP performance data, and local regulations. Once a BMP was identified and design criteria defined for each feasible BMP opportunity site, the impact of implementing this suite of BMPs on water quality in the region was evaluated.

One of the key multiple benefits of these strategies is the removal of nutrients in addition to bacteria.

The predicted wet weather load reductions for nitrate and phosphorus equal 79,100 and 14,200 lbs. /year, respectively.

3.3.6.3 Dry Weather BMP Water Quality Benefit Estimation

Appendix E describes dry weather load reduction quantification values, results, assumptions, and methods for the potential nonstructural and structural BMPs included in this WQIP (see provision B.2 chapter, section 2.5.1). The quantitative assessment of nonstructural BMP (including irrigation runoff reduction and commercial/industrial inspections) dry weather effectiveness follows a similar, but slightly different approach to the assessment of wet weather Public-Private Partnership Programs (see section 3.3.5.1), including:

1. Identify the source(s) addressed by the non-structural BMP;
2. Calculate the load generated by the source(s) addressed by the non-structural BMP;
3. Estimate the effectiveness of the non-structural BMP at reducing the load generated by the source(s); and
4. Calculate the non-structural BMP pollutant load reduction benefit from the information obtained in Step 2 and Step 3.

Additional dry weather non-structural BMPs that the Participating Agencies may implement include:

- Identification and control of sewage discharge to Participating Agency stormwater systems,
- Water waste/conservation ordinances,
- Car washing runoff ordinances,
- Water conservation outreach and education, and
- Other non-storm water flow reduction strategies as needed.

Furthermore, some dry weather structural controls may also be implemented to achieve the TMDL required fecal coliform reduction levels. These dry weather structural BMPs may include but are not limited to: low flow diversions to sewers, storm drain lining, catch basin dry wells, street gutter permeable pavement, bioretention swales, regional BMPs, etc. Table 27 provides a summary of the dry weather quantification results and corresponding assumptions and references.

Table 27. Summary of Dry Weather Quantification Results

Quantification Item	Quantitative Result[1]	Assumptions/References
Average Annual storm drain outfall bacteria dry weather load in the watershed	33.6 x 10^12 MPN/year	The baseline storm drain load was calculate by the model developed for the TMDL
Required bacteria load reduction	69.4% of the baseline stormwater load	San Diego Stormwater Permit Attachment E, Table 6.6
Expected load reduction from quantifiable dry weather nonstructural BMPs (Smart controller and turf grass replacement rebates, and Commercial/industrial site inspections/audit)	8.2 to 38% of the baseline Stormwater load	See following sections and Appendix E for assumptions and references. Additional benefits are expected from dry weather BMPs that were not quantified and these benefits constitute an additional level of conservatism.
Expected load reduction from all dry weather structural BMPs	31 to 61% of baseline stormwater load	To ensure that the required bacteria load reduction is achieved, structural BMPs may be implemented to this level.
Average stormwater total load reduction	69.4% of the baseline stormwater load	

1. The average annual baseline load and expected load reductions do not include contributions from the City of San Diego.

3.3.6.4 Wet Weather BMP Water Quality Benefit Estimation

Wet weather bacteria load reductions for each BMP type proposed for implementation by 2031 are provided in Table 28. The table presents the average, low, and high estimates for load reduction – the low and high estimates reflect variability in baseline pollutant loading (based on land uses) and variability in BMP effectiveness, and represent the 25th and 75th percentile of the modeled predictions.

Table 28. Summary of Modeled Wet Weather Load Reductions

BMP Category	FC Load Reduction (% of Average Municipal Land Use Load) 2003 WY Load [Low-High Range][a]
Programmatic BMPs	10% [9.2%-11%]
Potential Public Private Partnership Program	8.5% [1.6%-15%]
Redevelopment through Permit-Required LID Implementation	4.3% [3.4% - 5.1%]
Implemented Distributed	1.1% [0.6%-1.3%]
Stream Restoration BMPs	1.4% [0.3% - 2.5%]
Potential Distributed	8.6% [4.6%-10%]
Potential Regional	9.2% [5.3%-11%]
Load Reduction Adjustment	-4.0% [-1.6% - -5.8%]
Load Reduction Sum	39% [24% - 50%]
Target Load Reduction	**34.7%**

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

This analysis is applicable to the County of San Diego, City of El Cajon, City of Santee, City of La Mesa and Caltrans. Load reduction benefits for the City of San Diego were taken from the Phase II CLRP and Table 29 provides a summary of those load reductions.

Table 29 summarizes load reduction percentages estimated in the Phase II CLRP for the suite of BMPs proposed for implementation in the City of San Diego's jurisdiction. As shown in the table, these BMPs are expected to result in a load reduction percentage that meets the TLR percentage. For all jurisdictions except the City of San Diego, a summary of the predicted wet weather load

reductions from each BMP type proposed for implementation within the San Diego River Watershed, as well as the variability in potential BMP type performance, is included in Appendix D. In addition to the reductions in loading of the HPWQC and nutrients, the strategies proposed in this WQIP are expected to provide a number of other water resource benefits, including mitigation of physical and biological impairments. These benefits are also presented in further detail in Appendices D and E.

Table 29. Summary of Wet Weather Load Reductions for the City of San Diego

Condition	Non-structural (not modeled)	Non-structural (modeled)	Centralized on Public	Distributed on Public	Green Streets	Centralized on Acquired Private Land	Total [b]
Wet weather	10.00%	0.37%	2.76%	8.29%	13.28%	N/A	**34.70%**
Dry Weather [a]	10.00%	90.00%	-	-	-	N/A	**100.00%**

[a] Dry weather flow and load reductions reflect only runoff in urban sub-watershed.

[b] The load reduction analysis and scheduling of BMPs was performed for final targets only. Interim targets and associated schedules will further evaluated through an adaptive process as BMPs are implemented and their effectiveness is assessed.

Table 30. Watershed Load Reduction Summary

Load Reduction Category	FC Load Reduction (% of Load)
Target Load Reduction	34.7%
Predicted Wet Weather Load Reduction[a]	39% [24% - 50%]
Predicted Wet Weather Load Reduction for City of San Diego	34.7%
San Diego River Watershed Load Reduction	**37%**

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa

3.3.7 *City of El Cajon Example Strategies*

The City of El Cajon identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in the San Diego River watershed. Strategies such as education and outreach that target irrigation runoff, rebate and incentive opportunities for rain barrels and downspout disconnection, pilot green infrastructure projects, and multiuse treatment areas are considered across the City's jurisdiction.

The following strategies are examples of those selected by the City of El Cajon and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in Appendix A. The strategies and schedules are subject to change and are

contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning

The City of El Cajon is currently updating BMP design manual procedures to specify stormwater requirements. Additionally, El Cajon is working on the development and implementation of LID programs involving downspout disconnection, proprietary BMPs, and rainwater harvesting in appropriate areas and for applicable projects. El Cajon is also implementing source control, low-impact development, and on-site structural controls for priority development projects.

Existing Development

The City of El Cajon plans to maintain and update their watershed-based inventory of existing development. El Cajon also has plans for outreach to homeowners associations in a targeted manner. Further targeted outreach by way of printed materials to residential areas is planned, along with focused inspections, to target key sources of pollutants. Strategies will be developed to identify opportunities for retrofit projects along with stream, channel, and habitat rehabilitation projects in areas of existing development. The Forrester Creek Bacteria Management Plan implementation is scheduled for FY15-16.

Public Education and Participation

A key City strategy to enhance watershed stewardship and awareness of water quality is through public education and participation in the City of El Cajon.

3.3.8 *CITY OF LA MESA EXAMPLE STRATEGIES*

The City of La Mesa identified administrative policies, innovative pilot projects, urban development management programs, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in the San Diego River watershed. Strategies such as education and outreach that target irrigation runoff, rebate and incentive opportunities, pilot green infrastructure projects, and multiuse treatment areas are considered across the City's jurisdiction.

The following strategies are examples of those selected by the City of La Mesa and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in Appendix A. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning

The City of La Mesa is currently updating BMP design manual procedures to specify stormwater requirements. Additionally, La Mesa is implementing source control, low-impact development, and on-site structural controls for priority development projects.

Existing Development

The City of La Mesa continues to maintain and update their watershed-based inventory of existing development. La Mesa also coordinates with I Love a Clean San Diego on installation of cigarette ashcans throughout the downtown area to manage trash. La Mesa plans to explore options for coordination with Helix Water District concerning water conservation programs.

Structural Strategies – Green Infrastructure

The City of La Mesa is carrying out a restoration project at Alvarado Creek involving 900 feet of channel restoration to enhance the ecological value of the creek.

Public Education and Participation

A key City strategy to enhance watershed stewardship and awareness of water quality is through public education and participation in the City of La Mesa.

3.3.9 *CITY OF SANTEE EXAMPLE STRATEGIES*

The City of Santee identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in the San Diego River watershed. Strategies such as education and outreach that target irrigation runoff, rebate and incentive opportunities for rain barrels and downspout disconnection, pilot green infrastructure projects, and multiuse treatment areas are considered across the City's jurisdiction.

The following strategies are examples of those selected by the City of Santee and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in Appendix A. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning

The City of Santee is currently updating BMP design manual procedures to specify stormwater requirements. Additionally, Santee is also implementing source control, low-impact development, and on-site structural controls for priority development projects.

Existing Development

The City of Santee plans to maintain and update their watershed-based inventory of existing development. Santee also has plans for outreach to homeowners associations in a targeted manner. Santee will coordinate with the Padre Dam Municipal Water District on outreach, enforcement, and incentive programs to address impacts of improper water use and irrigation runoff. The City of Santee plans to develop a demonstration project for drought tolerant and native landscaping, permeable surfaces, and other low-impact development in coordination with the San Diego River Trail Expansion. Santee also has plans for outreach to homeowners associations in a targeted manner. Further targeted outreach by way of printed materials to residential areas is planned,

along with focused inspections, to target key sources of pollutants. Strategies will be developed to identify opportunities for retrofit projects in areas of existing development

Public Education and Participation

A key strategy for the City of Santee to enhance watershed stewardship and awareness of water quality is through public education and participation.

3.3.10 CITY OF SAN DIEGO EXAMPLE STRATEGIES

The City of San Diego has identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in multiple watersheds. These water quality improvement strategies are expected to provide the greatest benefits to the watershed and its residents, businesses, and communities within the City's jurisdictional boundaries. Furthermore, the City is currently developing a framework to evaluate other[5] potential additional benefits that the recommended strategies may provide beyond improved water quality. These other benefits may be financial, environmental, or societal. The recommended strategies will be evaluated on the basis of the number of other benefits they may provide, and could guide future updates to the Water Quality Improvement Plan.

The following strategies are examples of those selected by the City of San Diego and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in Appendix A. In San Diego River, an analysis using a watershed model was conducted to identify the strategies required to be implemented to meet interim and final goals. The strategies and implementation schedules identified in Appendix A provide reasonable assurance that numeric goals will be met based on that analysis. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies, if necessary. Furthermore, the strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. However, ff strategies are modified, the analysis will be updated as needed to provide assurance that numeric goals will be met.

These strategies will be implemented by the City of San Diego; they are not intended to be implemented by private entities (e.g., development, business, industry, etc.); however, some of the City's strategies, such as development planning, may have implications for private entities.

The City of San Diego will address discharges of bacteria and other pollutants through activities on public land across its jurisdiction in the San Diego River WMA. The following example strategies

[5] Other benefits refer to outcomes of a strategy beyond water quality improvements. Other benefits can include reduced air pollution, increased water conservation, aesthetics-induced property value increases, and increased business investments.

provide multiple benefits by addressing bacteria, and also other water quality pollutants such as trash and sediment.

Development Planning – Development and Implementation of a Green Infrastructure Policy and Program

In FY 2016 the City of San Diego will begin developing a policy that will require the inclusion of green infrastructure features on all suitable City projects, including non-SUSMP projects. This policy will be coordinated with ongoing efforts to update City design manuals and low-impact (LID) design standards for public LID BMPs. The program will begin with research and recommendations for ideal methods for green infrastructure project siting and prioritization within the City. By FY 2018, the City will complete construction of green infrastructure and/or green streets projects as detailed in the corresponding structural strategies.

Existing Development – Enhanced Property-Based Inspection Program

In FY 2016, the City plans to administer, as part of their existing development program, an enhanced property-based inspection program. The enhanced property-based inspection program is intended to increase the number of discharges prevented through property-based inspections and increased minimum BMP implementation. The City conducted an extensive multi-year pilot study of its business inspection program and found that more discharges were discovered and abated by inspecting large properties rather than individual businesses. For example, instead of inspecting one restaurant in a strip-mall, the entire strip-mall would be inspected as one property. Enhanced property-based inspections will be conducted at appropriate frequencies and using appropriate methods such as property- or area-based inspections, as specified in the Municipal Permit (Provision E.5). The program will also require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and pollutant-generating activities (PGAs).

Existing Development – Increased Enforcement

The City intends to enhance enforcement responses by increasing the number of Code Compliance staff. Between FY 2016 and FY 2019, the City is planning to gradually hire additional Code Compliance Officers and support staff to increase compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development as detailed in the City's Enforcement Response Plan. This effort will target increased enforcement of irrigation runoff and water-using mobile businesses.

Source Reduction Initiatives

The City of San Diego will continue to implement source reduction initiatives, where feasible. Bans or progressive phase-outs to be considered include pesticides and herbicides on landscapes, leaf blowers, plastic bags, and architectural copper (generally a legacy issue). The City will also consider legislative mandate and cooperative implementation of copper-free brake pads on city-owned vehicles to reduce pollutant deposition.

The City also plans expansion of programs to target irrigation runoff and other dry weather pollutant sources. These strategies primarily target meeting dry weather goals, but may also have

wet weather benefits. Because dry weather strategies tend to target the elimination of dry weather flows, they provide load reduction benefits to most water quality pollutants.

Existing Development – Residential and Commercial Rebate Programs Targeting Water Quality

The City plans to continue and expand its landscape-based rebate program to target water quality impacts from residential and commercial areas in FY 2016 and beyond. Expansion of this program may occur by providing for additional rebates and/or distribution of promotional and information material and brochures to community groups, libraries, and recreational centers. Educational material would emphasize watershed stewardship and encourage the implementation of designated BMPs through rebates for rain barrel BMPs in residential areas and grass replacement BMPs, downspout disconnection BMPs, and micro-irrigation BMPs in residential and commercial areas.

Increased Public Education and Participation

The City of San Diego conducts an extensive public education and outreach program through its Think Blue program. Examples include the following:

- The City will continue and expand several of its current outreach programs. Outreach programs would be widely implemented but targeted to HOAs, BOAs, maintenance districts, various community groups through organized community trash cleanup events, and water-using mobile businesses.

- Workshops will be held, community events will be organized, and informational material and brochures will be disbursed to reach community members and advise them of incentives, regulations, and training, and provide general information they need for implementation of good watershed stewardship practices or BMPs.

Cost of Service Study

The City plans to conduct a Cost of Service Study starting in FY 2015. This study will examine the full cost of flood control and storm water strategies needed to comply with storm water regulations for the City of San Diego. The City of San Diego's Watershed Asset Management Plan will be used as the basis for the study.

3.3.11 *COUNTY OF SAN DIEGO EXAMPLE STRATEGIES*

The County of San Diego reviewed various implementation approaches, programmatic policies, opportunities for innovative potential projects, and is researching the viability of green infrastructure as well as potential structural and distributed BMPs throughout the unincorporated areas. Much of the County of San Diego's jurisdiction within the San Diego River Watershed Management Area consists of unincorporated and predominantly undeveloped land, open space, and low-density residential areas. The jurisdictional strategies reflect the need to address these types of land uses and associated stormwater issues. As such, the County has outlined strategies to enhance current programs, identify prospective opportunities, and develop innovative approaches to stormwater program management.

Strategies including education and outreach that target irrigation runoff, rebate and incentive opportunities, pilot green infrastructure projects, and multiuse treatment areas will be considered across the County's jurisdictional area.

The following strategies represent several examples selected by the County of San Diego. A complete list of strategies and a description of each strategy is provided in Appendix A. The strategies and schedules are subject to change, and are contingent upon programmatic need and funding availability. They will be modified through the adaptive management process as needed.

Stormwater Discharges – Wet Weather Bacteria Reduction through Implementation of Residential Large Property Pet Waste Management Program

The County currently implements pet waste management in county parks and will continue to do so, with plans to expand the program to an additional focused management area. The County plans to continue targeting parks and other public areas to reduce negative impacts to habitat, wildlife, and water quality.

Stormwater Discharges – Wet Weather Bacteria Reduction through Implementation of Public Education and Participation Programs

An important approach to heighten watershed stewardship and mindfulness of water quality is through public education and participation. The County will continue its public education and participation programs. The County develops, improves, and distributes outreach materials; performs outreach presentations in schools; provides outreach to large residential properties; performs an over-irrigation outreach pilot; and provides educational workshops. The County also plans to implement a Sustainable Landscapes Program and a pilot Homeowners Association Outreach and Coordination project. Furthermore, the County sponsors numerous trash collection events in targeted areas of the watershed.

Stormwater Discharges – Wet Weather Bacteria Reduction through Implementation of Structural and Distributed BMPs

The County of San Diego will continue to investigate opportunities for green infrastructure implementation on public parcels. The County will develop a strategy to identify candidate areas of existing development that are appropriate for retrofit projects. The County plans to evaluate the feasibility of a pilot residential incentive program. The program could encourage rain water use

through installation of rain barrels, roof downspouts redirected to landscaped areas, rain gardens & other small scale bioretention/ infiltration BMPs.

The County will continue to consider green infrastructure or small scale structural BMPs to capture dry weather flows as needed.

Residential Programs

The County proposes promoting and encouraging implementation of designated BMPs in residential areas in the near future, including residential irrigation runoff reduction programs. These programs will be developed to address the impacts of improper water use and excessive irrigation runoff. A residential inspections tracking program will also begin by FY16.

3.3.12 *SCHEDULES FOR IMPLEMENTING STRATEGIES*

The following sections will detail the proposed schedules for phasing in the strategies discussed above. As noted earlier, the overall WQIP strategy is to pursue aggressive non-structural controls as the primary method for achieving wet weather load reduction goals and the sole method for achieving wet and dry weather load reduction goals. The benefits calculations summarized in Section 3.3.5 and Appendices D, E, and F support the viability of this strategy.

However, there is uncertainty inherent in some of the parameters used to estimate these load reduction benefits. Therefore, structural control options have also been selected to achieve load reduction goals if necessary. These will be implemented as necessary based on the adaptive management model upon which this WQIP is based.

3.4 PERMIT COMPLIANCE

Load reduction modeling for the structural and non-structural BMPs as detailed in Appendices B – E was performed to provide a reasonable assurance that the load reduction target for the San Diego River watershed management area can be achieved through implementation of this WQIP.

From Specific Provision 6.b.(3)(f) of the Permit, responsible jurisdictions must:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c)[7] as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e).

Load reduction modeling for the structural and programmatic (non-structural) BMPs as detailed in Appendices B-E was performed to provide a reasonable assurance that the load reduction target for the San Diego River watershed management area can be achieved through implementation of this WQIP. Table 31 summarizes the total quantified benefits for the proposed suite of BMPs relative to the required load reduction for the HPQWC. Table 31 below compares the required target load reduction for bacteria with the predicted wet weather load reduction. As shown, the predicted wet weather load reduction is greater than the estimated target load reduction to meet the HPWQC final numeric goal.

3.5 OPTIONAL WATERSHED MANAGEMENT AREA ANALYSIS

The Permit provides an innovative pathway for Participating Agencies to provide offsite alternative compliance options to their land development programs by performing watershed-specific analyses characterizing each watershed. In past permit cycles, waivers from onsite structural BMPs were possible, but only on a site-by-site basis, without consideration of the overall needs of the watershed. In contrast, the current Permit provides an option for Participating Agencies to promote implementation of controls on a watershed-based scale established by a greater understanding of the watershed needs and priorities, with the intent of greater overall water quality benefit. As indicated in the Southern California Coastal Water Research Project (SCCWRP) report (2012) that forms the basis of this provision, the first step in achieving this goal is "…identification of existing opportunities and constraints in order to prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects." The Watershed Management Area Analysis (WMAA), as denoted in the Permit, is an optional task intended to characterize important processes and characteristics of each watershed through creation of GIS layers that include the following information:

[7] The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

- A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;
- A description of existing streams in the watershed, including bed material and composition, and if they are perennial or intermittent;
- Current and anticipated future land uses;
- Potential coarse sediment yield areas; and
- Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

The Participating Agencies may use the data generated from the characterization analyses indicated above for two purposes:

1. To identify candidate projects that could potentially be used as offsite alternative compliance options in lieu of satisfying full onsite retention, biofiltration, and hydromodification runoff requirements.
2. To identify and/or prioritize areas where it is appropriate to allow certain exemptions from onsite hydromodification management BMPs.

Understanding that development of a WMAA is on a watershed-by-watershed basis could be time and funding intensive, the Participating Agencies elected to perform the watershed characterization and hydromodification management exemption mapping on a regional scale under a separate but concurrent effort to development of the WQIPs. The geospatial data and technical documentation from this project has been packaged individually for each watershed, with the San Diego River WMAA package in Appendix F.

3.5.1 *CANDIDATE PROJECTS*

The Permit allows Participating Agencies to develop a program as part of their overall JRMP that potentially allows development projects to participate in offsite alternative compliance projects that yield greater overall water quality benefit to the watershed. These alternative compliance projects would be implemented in lieu of meeting full onsite pollutant retention and hydromodification management control requirements as is required for all Priority Development Projects. As such, the County of San Diego, the City of San Diego, the City of Santee, and the City of El Cajon have elected to identify a list of potential projects, using the Regional WMAA data, as indicated in the San Diego River Candidate Project lists that appears in Appendix F. The effort to identify these projects is described in the associated San Diego River-specific WMAA data assessment that also appears in Appendix F. It should be noted that only the Candidate Project list is being supplied in the WQIP and the specific provisions and programmatic details of any potential Alternative Compliance programs that may be implemented by individual Participating Agencies is not part of the WQIP.

3.5.2 *HYDROMODIFICATION MANAGEMENT EXEMPTIONS*

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. The purpose of the hydromodification management requirements in the Regional Stormwater Permit is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters.

In some cases, priority development projects may be exempt from hydromodification management requirements if the project site discharges runoff to receiving waters that are not susceptible to erosion (e.g., a lake, bay, or the Pacific Ocean) either directly or via hardened systems including concrete-lined channels or existing underground storm drain systems.

The March 2011 Final Hydromodification Management Plan (HMP) identified certain exemptions from hydromodification management requirements by presenting "HMP applicability criteria." The Regional Stormwater Permit maintains some of these HMP applicability criteria. However, some of the applicability criteria are not included under the Regional Stormwater Permit unless the area or receiving water is mapped in the WMAA. Based on the results of the WMAA, the following exemptions from hydromodification management are proposed for the San Diego River watershed:

Receiving waters that are **exempt** based on the Regional Stormwater Permit include:

- The Pacific Ocean
- Lakes and Reservoirs
- Existing underground storm drains or concrete-lined channels draining directly to the ocean

Receiving waters or conveyance systems that are **recommended to be exempt** in the San Diego River Watershed based on studies that were prepared as part of the Regional WMAA includes:

- San Diego River from Pacific Ocean to confluence with San Vicente Creek;
- Forester Creek stabilized reach from the confluence with the San Diego River to Prospect Avenue; and
- Existing underground storm drains or concrete-lined channels discharging directly to the above receiving waters. These systems were identified based on stormwater data provided by the Copermittees via the data call. These systems may not represent all discharges to the above receiving waters. Additional systems may be considered exempt if there is no evidence of erosion at the outfall of the conveyance system, and any other criteria determined by the local jurisdiction.

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