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SUBMITTED BY	<u>PLANNING DIRECTOR</u>
DATE ACTION REQUIRED	<u>10/07/15</u>

COUNCIL ACTION	<input checked="" type="checkbox"/> (X)
PUBLIC HEARING REQUIRED	<input type="checkbox"/> ()
RESOLUTION	<input type="checkbox"/> ()
ORDINANCE 1 ST READING	<input type="checkbox"/> ()
ORDINANCE 2 ND READING	<input type="checkbox"/> ()
CITY CLERK'S INITIALS	<input type="checkbox"/> ()

**IMPERIAL CITY COUNCIL
AGENDA ITEM**

SUBJECT: DISCUSSION/ACTION: MS4 (MUNICIPAL SEPARATE STORM SEWER SYSTEM) COMPLIANCE DOCUMENTS

1. APPROVE AND ADOPT PUBLIC OUTREACH PLAN
2. APPROVE AND ADOPT PROGRAM EFFECTIVENESS ASSESSMENT AND IMPROVEMENT PLAN

DEPARTMENT INVOLVED: PLANNING

BACKGROUND/SUMMARY:

As part of the City’s MS4 (Municipal Separate Storm Sewer System) General Permit, the City is required to complete certain items each fiscal year. Council adopted a comprehensive Stormwater Ordinance on August 5, 2015 but the Public Outreach Plan and the Program Effectiveness Assessment and Improvement Plan (PEAIP) are the last remaining items for this fiscal year. The PEAIP is based on the California Stormwater Quality Association’s (CASQA) Guidance Document for tracking short-term and long-term effectiveness of the stormwater program and a description of how the City will use the data to improve the program. The PEAIP focuses on the impact of the stormwater program rather than the strict implementation of the program.

FISCAL IMPACT:	F.O. INITIALS: _____
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STAFF RECOMMENDATION:

Staff recommends approval of all necessary documents to comply with MS4 requirements.

MANAGER’S RECOMMENDATION:	MANAGER’S INITIALS
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MOTION:

SECONDED:	APPROVED ()	REJECTED ()
AYES:	DISAPPROVED ()	DEFERRED ()
NAYES:		
ABSENT:	REFERRED TO:	

OCTOBER 2015



Program Effectiveness Assessment and Improvement Plan

This *Program Effectiveness Assessment and Improvement Plan* uses the California Stormwater Quality Association (CASQA) guidance document, *A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs* (February 2015), as its basis and is consistent with the approach described therein. Much of the text in this document is directly from the CASQA guidance document.

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1. Introduction

The Phase II Small Municipal Separate Storm Sewer System (MS4) General Permit¹ (Phase II Permit) requires the development and implementation of a *Program Effectiveness Assessment and Improvement Plan* (PEAIP). The PEAIP must address each of the elements outlined in Provision E.14 (traditional small MS4s). The PEAIP must include the strategy that the Permittee will use to track the short- and long-term effectiveness of the stormwater program, the specific measures that will be used to assess the effectiveness of the prioritized best management practices (BMPs), groups of BMPs, and/or the stormwater program as a whole, and a description of how the Permittee will use the information obtained through the PEAIP to improve the stormwater program.

The City of Imperial's (City of Imperial) storm water program addresses many pollutants of concern (POCs) and implements a wide range of BMPs; however, consistent with Provision E.14 requirements, the PEAIP will present a plan for assessing the effectiveness of a subset of prioritized BMPs that are focused on high priority POCs. This approach provides a manageable assessment program that can be improved, targeted, and refined.

The City of Imperial has developed this PEAIP as a guidance document for its stormwater staff to assist them in conducting program effectiveness assessments (EAs). The PEAIP is modeled after the methodology described within the California Stormwater Quality Association (CASQA) document, *A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs* (February 2015).² The PEAIP outlines the approach that the City of Imperial will use to adaptively manage its stormwater program to improve its effectiveness at reducing the identified high priority POCs, thereby achieving the maximum extent practicable (MEP) standard and protecting water quality.

The PEAIP is focused on the *impact* that the stormwater program is having rather than the strict *implementation* of the program. By focusing the EA in this manner, the City of Imperial will increase their ability to understand if its stormwater program is achieving the intended outcomes and can identify necessary modifications to the program to make it more effective.

This PEAIP addresses the requirements in Provision E.14, as summarized in **Table 1**.

¹ Order No. 2013-0001-DWQ, effective July 1, 2013

² Language from the 2015 CASQA Guidance Document is used as the basis for much of the PEAIP.



Table 1. Phase II Permit PEAIP Provisions and Corresponding PEAI Sections (Traditional MS4s)

Phase II Permit Provision(s)	PEAIP Section
E.14.a.(i-iii)	1. Introduction
E.14.a.(i) E.14.a.(ii)(b)(5)	2.1. Identification of Sources and Impacts 2.1.2. Urban Runoff and MS4 Contributions ³
E.14.a.(i) E.14.a.(ii)(b)(1)	2.3. Identification of the Stormwater Program Activities
E.14.a.(i) E.14.b.(i) and (ii)	5. Program Reporting and Modifications
E.14.a.(ii)(a)(1)	1.1. Stormwater Program Goals and Objectives
E.14.a.(ii)(a)(2-9)	2. Program Effectiveness Assessment Approach and Development
E.14.a.(ii)(b)(2)	2.2. Identification of the Key Target Audiences 2.2.2. Barriers and Bridges to Action ⁴
E.14.a.(ii)(b)(3)	2.2. Identification of the Key Target Audiences 2.2.1. Target Audience Actions ⁵
E.14.a.(ii)(b)(4)	2.1. Identification of Sources and Impacts 2.1.3. Source Contributions ⁶
E.14.a.(ii)(b)(6)	2.1. Identification of Sources and Impacts 2.1.1. Receiving Water Conditions
E.14.a.(ii)(c-d)	4. Data Assessment and Collection
E.14.a.(ii)(e-f)	3. Management Questions

The schedule for the implementation of the PEAI is as follows:

- Year 2 Annual Report (October 15, 2015): Submit the PEAI
- Year 3 and Year 4 Annual Reports (October 15, 2016 and October 15, 2017): Describe the implementation of the PEAI, summarize the data obtained, and provide an analysis of the data (i.e., the EA)

³ Provision E.14.a.(ii)(b)(5) uses the term “MS4 Discharge Quality” for Outcome Level 5; however, the 2015 CASQA Guidance Document and this PEAI use the term “Urban Runoff and MS4 Contributions” for Outcome Level 5 to reflect the new approach that has been developed.

⁴ Provision E.14.a.(ii)(b)(2) uses the term “Awareness” for Outcome Level 2; however, the 2015 CASQA Guidance Document and this PEAI use the term “Barriers and Bridges to Action” for Outcome Level 2 to reflect the new approach that has been developed.

⁵ Provision E.14.a.(ii)(b)(3) uses the term “Behavior” for Outcome Level 3; however, the 2015 CASQA Guidance Document and this PEAI use the term “Target Audience Actions” for Outcome Level 3 to reflect the new approach that has been developed.

⁶ Provision E.14.a.(ii)(b)(4) uses the term “Pollutant Load Reductions” for Outcome Level 4; however, the 2015 CASQA Guidance Document and this PEAI use the term “Source Contributions” for Outcome Level 4 to reflect the new approach that has been developed.



- Year 5 Annual Report (October 15, 2018): Describe the implementation of the PEAIIP, summarize the data obtained, provide an analysis of the data (i.e., the EA), and describe any program modifications identified

1.1. STORMWATER PROGRAM GOALS AND OBJECTIVES

Stormwater programs are inherently complex due to a number of factors such as: the number of pollutant sources (construction, industrial, commercial, residential, new development, etc.), the limited ability to directly control the behaviors of target audiences, the extensive geographic coverage of the programs, the number of constituents that must be addressed, the co-mingling of flows within the drainage system, and the potential impacts to water quality from other sources (wind-blown materials, groundwater seepage, aerial deposition, etc.).

The overall goals of the City of Imperial’s stormwater management program are to a) reduce the potential impact(s) of pollution from urban areas on waters of the State and waters of the United States (U.S.) and protect their beneficial uses; and b) develop and implement an effective stormwater program that is well-understood and broadly supported by stakeholders.

The core objectives of the stormwater program are to:

1. Identify and control those pollutants in urban runoff that exceed water quality objectives (WQOs), as measured in the waters of the State and waters of the U.S., and protect the beneficial uses of the receiving waters;
2. Comply with the federal and State regulations to eliminate or control, to the MEP, the discharge of pollutants associated with urban runoff from the City of Imperial’s stormwater drainage system;
3. Develop a cost-effective program which focuses on the prevention of pollution in urban stormwater;
4. Seek cost-effective alternative solutions where prevention is not a practical solution for exceedances of WQOs; and
5. Coordinate the implementation of control measures with other agencies.

The PEAIIP supports these stormwater program goals and objectives by providing a framework for the implementation and assessment of prioritized BMPs focused on the high priority POCs, as well as a feedback loop for the adaptive management of the City of Imperial’s stormwater program. When considered as part of a larger program planning process, assessment principles and approaches can help to guide managers toward implementation strategies with the greatest opportunity for long-term success.



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2. Program Effectiveness Assessment Approach and Development

GUIDANCE: This section provides an overview of the stormwater program management cycle and the CASQA EA approach. The associated subsections provide an overview of all six CASQA outcome levels, how they were used in the development of the PEAIP, and how they will be used in the implementation of the PEAIP.

This PEAIP was developed to implement a focused evaluation of priority program elements and BMPs, ensuring that they are well-targeted and determining whether intended results are being achieved.

Stormwater program management⁷ can be described by a cycle divided into three phases of activity (**Figure 1**):

- **Program Planning and Modification** – In this phase, the City of Imperial is identifying the critical components and POCs for its stormwater program, as well as developing an EA approach and associated management questions to assist in determining if the program is achieving the intended results.
- **Program Implementation** – In this phase, the City of Imperial is implementing the program and obtaining the assessment data needed to answer the management questions.
- **Effectiveness Assessment** – In this phase, the City of Imperial is conducting EAs, reviewing the results, and determining if any program modifications are necessary. This is typically conducted as a part of the Annual Reports and/or Report of Waste Discharge, but may also be a part of other regulatory requirements such as Total Maximum Daily Loads (TMDLs). Once identified, the City of Imperial can make the program modifications and initiate the next round of implementation, leading again to renewed assessment and planning (see **Section 5**).

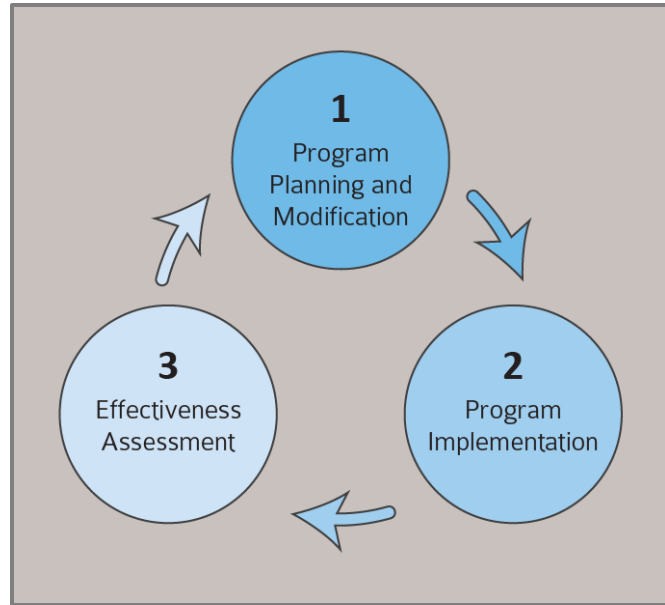


Figure 1. The Program Management Cycle (CASQA, 2015)

⁷ See 2015 CASQA Guidance Document, Section 3.0: Introduction to Strategic Planning for Stormwater Management Programs

This process is applied repeatedly over time in order to focus the stormwater program in on the most effective BMPs and the achievement of the desired results.

The CASQA EA approach⁸ utilizes a general model that aggregates three primary components from the six outcome levels and associated, general outcome types (**Figure 2**). The three primary components are:

- Sources and Impacts (Outcome Levels 4-6) – This component addresses the generation, transport, and fate of urban runoff pollutants. It includes sources (sites, facilities, areas, etc.), stormwater conveyance systems, and the water bodies that ultimately receive the source discharges (receiving waters). This component is typically assessed on a long-term basis.
- Target Audiences (Outcome Levels 2-3) – This component focuses on understanding the behaviors of the people responsible for source contributions. It explores the factors that determine existing behavioral patterns and looks for ways to replace polluting behaviors with non-polluting behaviors. This component is typically assessed on a short- and/or long-term basis.
- Stormwater Programs (Outcome Level 1) – Stormwater programs are the road map for the improvements that managers wish to attain in receiving waters. Their immediate purpose is to describe programs that will facilitate changes in the behaviors of key target audiences. This component is typically assessed on a short-term basis.

The six categories of outcome levels establish a logical and consistent organizational scheme for assessing and relating individual outcomes.

This PEaip will focus primarily on the Target Audiences (Outcome Levels 2 and 3) and the Sources and Impacts (Outcome Levels 4 through 6) and will provide a plan to collect data that can be used to improve the stormwater program and protect water quality. Assessment at Outcome Levels 5 and 6 may be undertaken once program implementation has progressed to a point that improvements in outfall and receiving water quality are statistically significant. The timeframe for this level of change to be realized will vary based on a variety of factors.

The approach to be used for each of the outcome levels is described in more detail within this section.

⁸ See 2015 CASQA Guidance Document, Section 2.0: Stormwater Management Approach



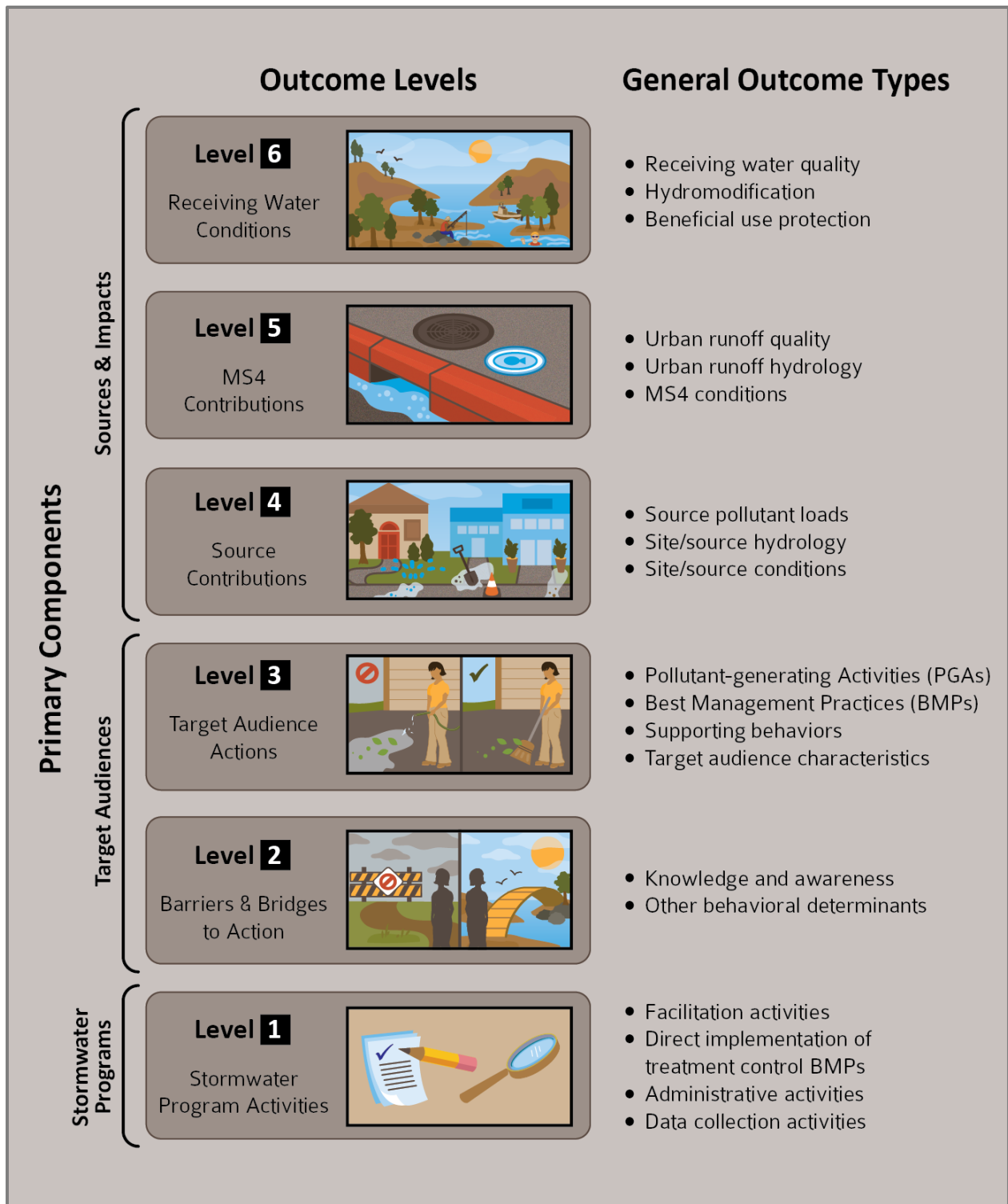


Figure 2. General Stormwater Management Model (CASQA, 2015)

2.1. IDENTIFICATION OF SOURCES AND IMPACTS⁹

2.1.1. Receiving Water Conditions (Outcome Level 6)¹⁰

One of the primary objectives of the stormwater program is the protection of the beneficial uses of the receiving waters. The Phase II Permit recognizes that there is a need to conduct the EA based on prioritized POCs. The number of POCs ultimately selected depends on the number of TMDLs, 303(d) listed waterbodies and/or regional issues that are identified. Where POCs are unidentified, the prioritized BMPs and assessment may be based on common urban pollutants.

Although Outcome Level 6 assessments may occur in future Permit terms as a part of a regional effort, the receiving water conditions were used to focus the PEAIIP and select the key metrics that will be used to assess the effectiveness of the stormwater programs. This PEAIIP will focus on high priority POCs identified in **Section 2.1.2.**

2.1.2. Urban Runoff and MS4 Contributions (Outcome Level 5)¹¹

Level 5 Outcomes may be measured either within the MS4 or within discharges from the MS4. In either case, evaluation typically focuses on pollutant concentrations or loads, or both. Level 5 Outcomes provide a direct linkage between upstream sources and receiving waters and, as such, are a critical expression of stormwater program success. However, due to the temporal and spatial variability of water quality data, it is extremely challenging and takes many years and a significant amount of data to establish linkages between pollutants in MS4 discharges and the conditions within the receiving waters.

Although Outcome Level 5 assessments may occur in future Permit terms, the known urban runoff and MS4 contributions were used to focus the PEAIIP and select the key metrics that will be used to assess the effectiveness of the stormwater programs.

⁹ See 2015 CASQA Guidance Document, Section 4.0: Source and Impact Strategies

¹⁰ See 2015 CASQA Guidance Document, Section 4.2 Outcome Level 6: Receiving Water Conditions.

¹¹ See 2015 CASQA Guidance Document, Section 4.3 Outcome Level 5: MS4 Conditions



2.1.3. Source Contributions (Outcome Level 4)¹²

Outcome Level 4 addresses urban sources and the discharges from them. A source is anything with the potential to generate pollutants prior to their introduction to the MS4. Source loadings are the pollutant loadings added by the urban sources to an MS4. Source reductions are the changes in the amounts of pollutants associated with specific sources before and after BMPs are employed. However, it is challenging to measure source loadings and/or reductions achieved by individual and/or groups of BMPs. As a result, the City of Imperial will need to rely on direct measurements (where possible) and/or estimates of source reductions.

The City of Imperial will focus its evaluation of Outcome Level 4 on the high priority POCs. Doing so will help direct the City of Imperial's efforts and provide the basis for the management questions outlined in **Section 3**.

In order to determine the specific target audiences and the appropriate prioritized BMPs, the City of Imperial has evaluated the 2010 303(d) list and local programmatic information and used best professional judgment and/or knowledge of local and/or regional water quality issues to identify the primary urban runoff sources of each POC, as shown in **Figure 3**. It is expected that assessment at this outcome level will be included in long-term EAs.



The flow chart in **Figure 5** builds from **Figure 4** and includes the primary urban sources of the example POC.

For each high priority POC identified for your agency, the applicable TMDL(s) should be reviewed—or best professional judgment used—to identify the primary urban sources. These are the POC sources that will be the focus of the EAs.

¹² See 2015 CASQA Guidance Document, Section 4.4 Outcome Level 4: Source Contributions

CASQA Outcome Level

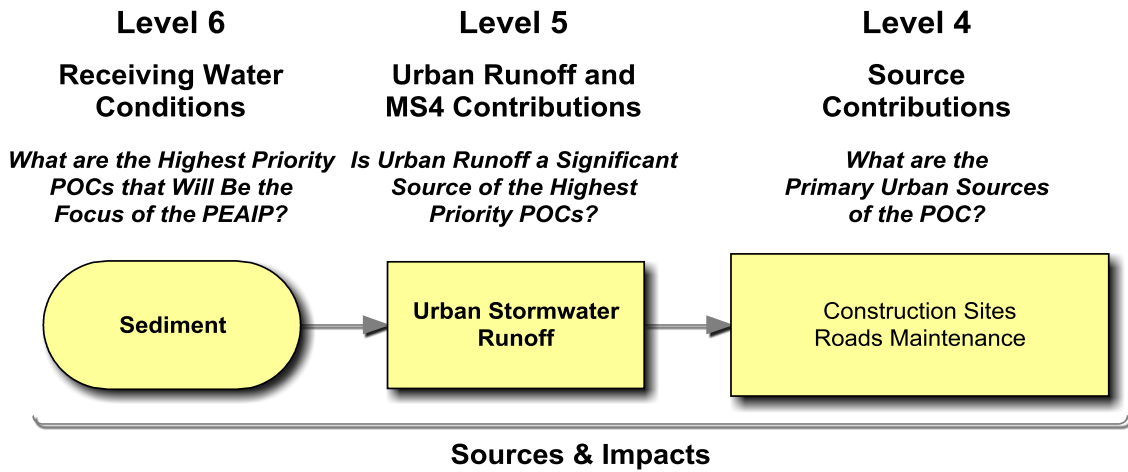


Figure 3. Primary Urban Sources of the High Priority POCs

2.2. IDENTIFICATION OF THE KEY TARGET AUDIENCES (OUTCOME LEVELS 2 AND 3)¹³

This component focuses on the actions of target audiences and the factors that influence them. Target audiences are the individuals and populations that a stormwater program is directed to and may include, but are not limited to, municipal employees, contractors, and the general public. Because source reductions can only be achieved by the people responsible for pollutant loadings, a successful program will be one that is able to induce positive behavioral changes in the target audiences.

Although Outcome Levels 3 (Target Audience Actions) and 2 (Barriers and Bridges to Action) are closely related, they are distinct outcome levels.

- Outcome Level 3 focuses on the identification of target audiences associated with the primary sources of high priority POCs, as well as the behavioral patterns of these target audiences, with the goal of assessing *behavior change* over time.
- Outcome Level 2 focuses on identification of the factors that influence target audience behaviors, with the goal of using these factors to develop strategies to increase target audience *awareness* of the need to reduce pollutant-generating activities (PGAs) and implement prioritized BMPs. Level 2 Outcomes are often used to gauge progress in, or to refine approaches for, achieving Level 3 Outcomes (see **Section 2.2.2**).

¹³ See 2015 CASQA Guidance Document, Section 5.0: Target Audience Strategies



2.2.1. Target Audience Actions (Outcome Level 3)¹⁴

Level 3 Outcomes address the actions of target audiences and whether or not changes are occurring within these target audiences over time. The major categories of target audience actions are:

- PGAs – behaviors that contribute pollutants to urban runoff (e.g., pressure washing without containment, improper pet waste disposal, spills during materials loading and unloading)
- BMPs – activities or other controls that are implemented to reduce or eliminate discharges of pollutants (e.g., integrated pest management (IPM) practices, implementation of secondary containment)
- Supporting behaviors – include a wide range of potential actions that are distinct from BMP implementation but help support the implementation (e.g., pollution incident reporting, public involvement)

The City of Imperial will focus its evaluation of Outcome Level 3 on the actions of target audiences for the high priority POCs. The City of Imperial has identified the critical target audience(s) for the specific urban runoff source(s) of each high priority POC (**Figure 4**), along with management questions that delineate the critical target audience actions (**Section 3**).

The City of Imperial will evaluate the effectiveness of its stormwater program at Outcome Level 3 by using the management questions to guide its assessment of target audience implementation of BMPs and reduction of PGAs. It is expected that assessment at this outcome level will be included in the short- and long-term EAs.

¹⁴ See 2015 CASQA Guidance Document, Section 5.2 Outcome Level 3: Target Audience Actions



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The flow chart in **Figure 6** builds from **Figure 5** and includes the specific target audiences for the primary urban sources.

For each high priority POC, the target audiences listed under Outcome Level 3 should be identified based on the primary urban sources (Outcome Level 4).

CASQA Outcome Level

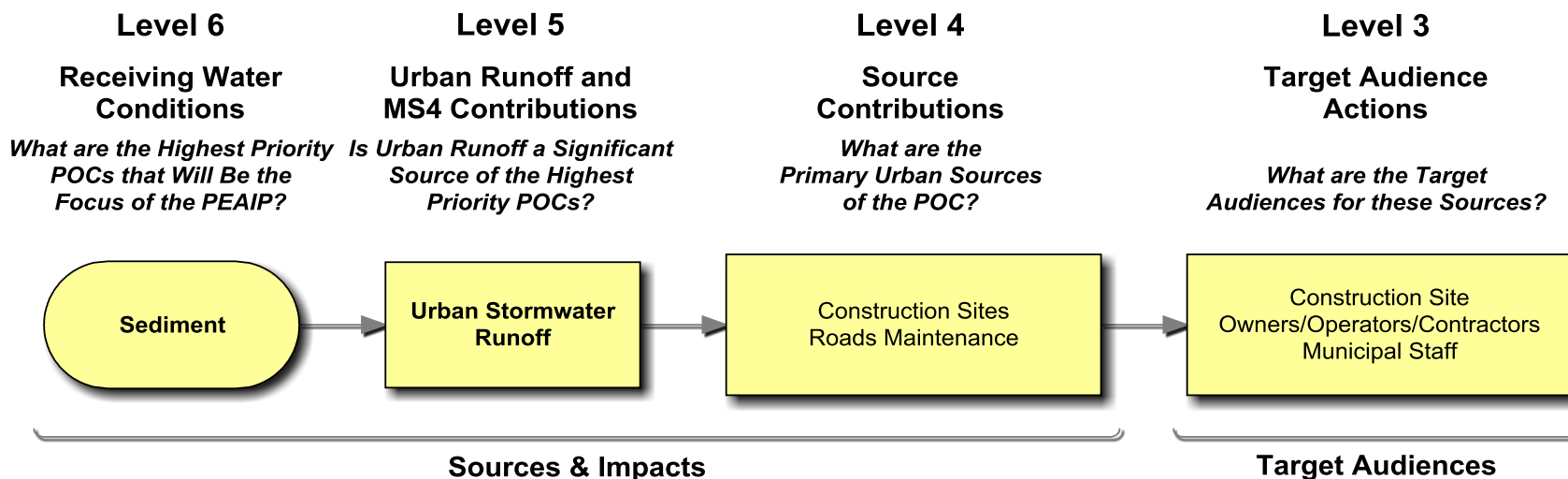


Figure 4. Target Audiences Identified for Urban Runoff Source Contributions of POCs



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2.2.2. Barriers and Bridges to Action (Outcome Level 2)¹⁵

Level 2 Outcomes are critical because they form the basis for achieving desired behavioral changes and provide a means of gauging progress toward their achievement. The term “barriers and bridges” refers to the fact that there are factors that may aid or inhibit a desired behavior and that these need to be understood in order to affect the desired change. People won’t act differently unless they understand the problem and are motivated—and able—to change.

Level 2 Outcomes provide a means of gauging whether the prioritized activities (e.g., outreach, training, other program activities) are producing changes in the behavior of the target audiences through increases knowledge and awareness, as well as changes in attitudes. Examples of Level 2 Outcomes range from awareness of basic concepts (e.g., why stormwater pollution is a problem; the difference between storm drains and the sanitary sewer) to specific knowledge (e.g., how to dispose of pet waste; how to properly install and maintain a silt fence).

Level 2 Outcomes are often used to gauge progress in, or to refine approaches for, achieving Level 3 Outcomes. That is, an understanding of whether awareness, knowledge, and/or attitudes have changed will allow the identification of barriers and bridges that may be influencing the desired target audience behavior.

The City of Imperial will work to identify barriers and bridges that may be influencing target audience behavior. The City of Imperial will assess Outcome Level 2 on an as-needed basis as part of the adaptive management process (**Figure 5**). It is expected that assessment at this outcome level will be included in the short- and long-term EAs.

¹⁵ See 2015 CASQA Guidance Document, Section 5.3 Outcome Level 2: Barriers and Bridges to Action



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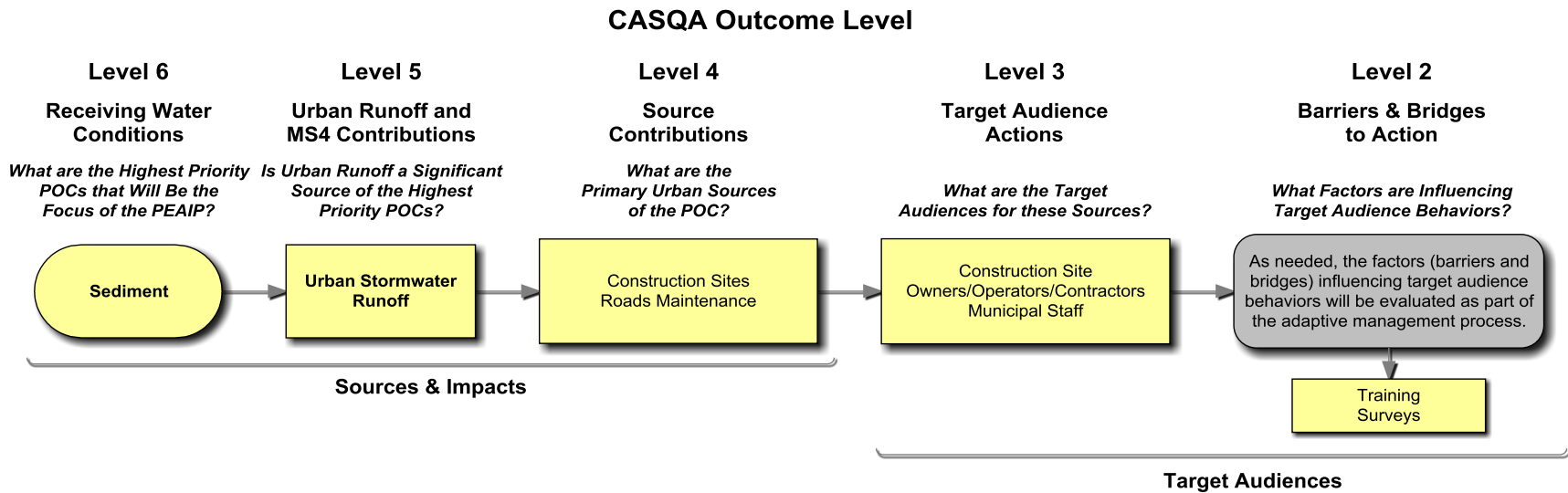


Figure 5. Assessment of Barriers and Bridges to Action

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2.3. IDENTIFICATION OF THE STORMWATER PROGRAM ACTIVITIES (OUTCOME LEVEL 1)¹⁶

Level 1 Outcomes focus on the various activities that are conducted within a program. Examples of these activities include providing education to residents, inspecting businesses, conducting surveys of target audiences, and conducting monitoring. Outcome Level 1 only measures the *implementation* of the stormwater program, rather than the *impact* of the program is having. The EAs will focus on the impact of the stormwater program by assessing Outcome Levels 2 through 6 as they relate to the high priority POCs.

Based on the identification of the highest priority POCs and their potential sources, target audiences, and key implementation activities (prioritized BMPs), the City of Imperial has identified the Program Elements for which the implementation of prioritized BMPs will be assessed (**Table 2**).

The implementation requirements within Attachment G of the Phase II Permit and the approved TMDLs were reviewed, and these requirements were used as the basis for both the management questions (see **Section 3**) and the identification of prioritized BMPs, or key implementation activities, for specific target audiences.

¹⁶ See 2015 CASQA Guidance Document, Section 6.0 Program Implementation Strategies and Section 6.2 Step 1-A: Program Implementation Activities



Table 2. Program Elements for Which Prioritized BMPs Will Be Assessed through the Identified Management Questions

Program Element	Phase II Permit Provision(s)	Pollutants of Concern (POCs)		
		Sediment	XX	XX
Education and Outreach	E.7	--	**	**
Public Involvement and Participation	E.8	--	**	**
Illicit Discharge Detection and Elimination	E.9	--	**	**
Construction Site Stormwater Runoff Control	E.10	✓	**	**
Pollution Prevention/Good Housekeeping	E.11	✓	**	**
Post Construction Stormwater Management	E.12	--	**	**
Water Quality Monitoring	E.13	--	**	**

For each high priority POC, a summary of prioritized BMPs for the identified target audiences is provided in **Figure 6**. More detail is provided within the management questions (**Section 3**), as well as the data assessment and collection table(s) within **Section 4**.



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CASQA Outcome Level

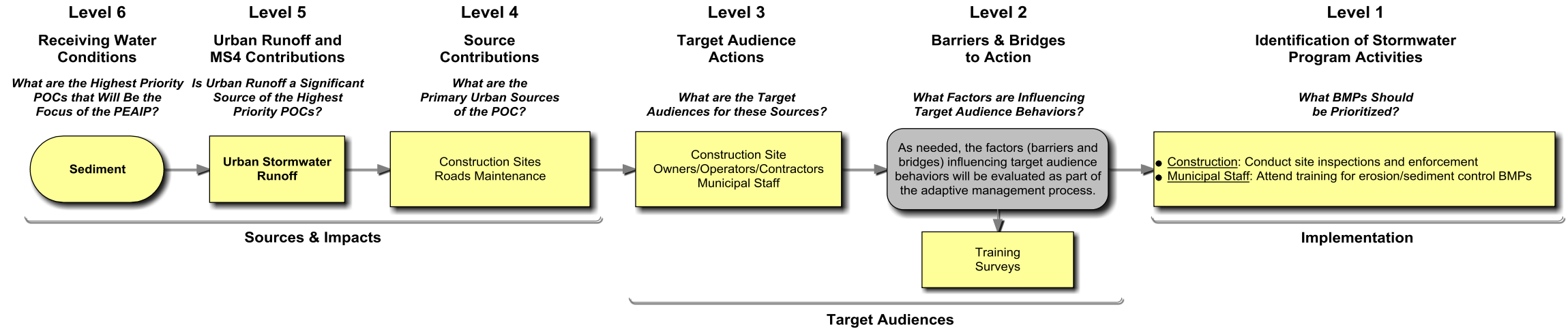


Figure 6. Prioritized BMPs Identified for Target Audiences

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3. Management Questions¹⁷

In order to focus the EAs, the City of Imperial has identified management questions for the prioritized BMPs that may be implemented to address the high priority POCs.

The assessment data and information collected by the City of Imperial (**Section 4**) are focused on Outcome Levels 2 through 6 and will be used to answer both water quality-based and/or programmatic-based management questions related to the prioritized BMPs.

The assessment data and information collected by the City of Imperial (**Section 4**) are focused on Outcome Levels 2 through 4 and will be used to answer programmatic-based management questions related to the prioritized BMPs.

¹⁷ See 2015 CASQA Guidance Document, Section 7.3 Assessment Objectives, Attachment B: Sources and Activities Profile Sheets, and Attachment C: Pollutant Profile Sheets



Pursuant to Provision E.14(a)(ii)(e-f), the types of questions that were considered for this PEAIIP include the following:¹⁸

- To what extent did implementation of the BMPs, group of BMPs, or stormwater program enhance or change receiving water quality?¹⁹ [OL6]
 - Did exceedance(s) of water quality objectives or water quality standards persist notwithstanding implementation of the stormwater program?²⁰
- To what extent did implementation of the BMPs, group of BMPs, or stormwater program enhance or change the urban runoff and discharge quality?²¹ [OL5]
- To what extent did prioritized BMPs or group of BMPs reduce pollutant loads from their sources to the storm drain system?²² [OL4]
- To what extent did prioritized BMPs or group of BMPs change the target audience's behavior?²³ [OL3]
- What barriers or bridges are influencing or could influence the target audience's ability or desire to implement the prioritized BMPs or group of BMPs? [OL2]

Based on a review of the types of management questions that may be utilized (above), the implementation requirements within Attachment G of the Phase II Permit, the approved TMDLs, the 303(d) list, and local monitoring data (where available), as well as an understanding of the primary urban sources of the POCs, the City of Imperial has identified management questions for each of the high priority POCs.

The management questions and CASQA outcome level(s) that they are addressing are summarized below.

¹⁸ The PEAIIP is focused on the *impact* that the stormwater program is having rather than the strict *implementation* of the program. Thus, the question listed in Provision E.14.a.(ii)(e)(1) regarding implementation of the Permit requirements is not included in the PEAIIP.

¹⁹ E.14.a.(ii)(f)(2)

²⁰ E.14.a.(ii)(f)(3)

²¹ E.14.a.(ii)(f)(1)

²² E.14.a.(ii)(e)(3)

²³ E.14.a.(ii)(e)(2)



3.1. SEDIMENT MANAGEMENT QUESTIONS

The management questions for sediment are summarized below. The CASQA Outcome Level(s) addressed by the questions are indicated in brackets.

3.1.1. Construction Site Stormwater Runoff Control [OL2-3]

- Are the construction sites being managed so that they are in compliance with the corresponding permits, local codes, and ordinances and preventing sediment from leaving the site?
 - Are Erosion Control, Sediment Control, and Good Housekeeping and Material and Waste Management BMPs being implemented and maintained?
 - Are any of the construction sites a source of illicit discharges of sediment?
 - If so, are these sites aware of the BMPs that they should be implementing on site, and are these BMPs implemented and maintained?
 - What are the common issues with BMP implementation that are identified during illicit discharge follow-up inspections?

3.1.2. Pollution Prevention and Good Housekeeping [OL2-3]

- Are Permittee staff aware of the erosion and sediment control BMPs that should be implemented during road maintenance, and do they understand how to implement them?
 - Are Permittee staff attending erosion and sediment control training sessions?



4. Data Assessment and Collection

4.1. DATA ASSESSMENT METHODS²⁴

During the EA process, the data collected will be assessed and/or analyzed using a variety of methods, such as:

- **Qualitative assessment** includes confirmation that an activity (e.g., construction site inspections) was conducted and/or that a specific task (e.g., completion of a pet waste brochure) was completed, as well as narrative assessment.
- **Descriptive statistics** are numbers that are used to summarize and describe data. Several descriptive statistics are often used at one time, to give a full picture of the data. Examples of descriptive statistics are counts (includes quantification and tabulation), averages, variance, etc. Other information includes: direct quantitative measurements of pollutant load removal, estimates of pollutant load removal for BMPs where direct measurement of pollutant removal is overly challenging, and direct quantitative measurement of behaviors that serve as proxies of pollutant removal or reduction.
- **Comparisons to established reference points** involve comparing collected data to established targets (targeted outcomes, discharge prohibitions, WQOs, required activity levels, etc.) or other reference points (other programs, previous results, baseline values, visual comparison using photographs over time, etc.).
- **Temporal change** is change over time. This includes variability, trends, and changes due to program implementation (e.g., simple change [absolute or %] or statistical trends).
- **Spatial analysis** allows comparisons between watersheds or other geographic areas. Impacts of runoff and/or control measures can be evaluated based on characteristics of the geographic regions (differences in land use, geology and geomorphology, hydromorphology, etc.).

²⁴ See 2015 CASQA Guidance Document, 6.3 Step 1-B Data Collection and Analysis Activities and 7.5 Data Analysis



4.2. DATA COLLECTION METHODS²⁵

The assessment data will be collected through various means such as:

- **Internal Tracking by Stormwater Program** of internal program data only (e.g., inspection data, public outreach and education efforts)
- **Reporting to Stormwater Program** by third parties only (e.g., BMP maintenance certifications, industrial facility monitoring data)²⁶
- **Site Investigations/Inspections** conducted by stormwater programs to directly observe or assess a practice (e.g., inspections, site visits, complaint investigations)
- **Interviews** conducted by stormwater programs to discern awareness and behavior (e.g., of third parties or stormwater program staff, municipal staff, public focus groups)
- **Surveying** by stormwater programs of third parties or stormwater program staff to discern knowledge, attitudes, awareness, behavior of a target audience (e.g., pre-/post-training surveys, public outreach surveys)
- **Monitoring and Sampling** data obtained directly by stormwater programs or contractors (e.g., receiving water or MS4 sampling, industrial facility visual observations during inspections)
- **Review of External Data Sources** by stormwater program staff (e.g., of data or information obtained via literature, the Regional Water Board, other regulatory programs, online databases, third parties)
- **Special Investigations** can encompass any of the categories above, but normally involve a more intensive one-time focus.

²⁵ See 2015 CASQA Guidance Document, 6.3 Step 1-B Data Collection and Analysis Activities, 7.4 Data Collection, Attachment B: Sources and Activities Profile Sheets, and Attachment C: Pollutant Profile Sheets

²⁶ The Phase II Permit requires Permittees to identify assessment methods for privately owned BMPs. At this time, the City of Imperial does not anticipate that these types of BMPs (e.g., structural, treatment control) will need to be evaluated for the high priority POCs that have been identified.



4.3. DATA REQUIREMENTS FOR SELECTED METRICS AND OUTCOME LEVELS

In the table(s) below, the POC-specific management questions representing focused program activities and/or prioritized BMPs are presented by Program Element, along with the assessment methods that will be used during the EA process and the associated assessment data that should be collected for evaluation (**Table 6**). The CASQA outcome levels that may be supported by the EA results are also indicated. Where applicable, the units for the required data are specified.

Although **Table 6** identifies the management questions, data assessment methods, and data collection methods that will initially be used for the EAs, future PEAIPs may modify and/or incorporate other management questions or data assessment/ collection methods based on the information gained from the implementation of the PEAIP. Any modifications to the PEAIP will be identified as a part of the Annual Reports.



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Table 3. Sediment Management Questions, Data Assessment Methods, and Data Collection Methods, by Program Element

Management Questions	Data Assessment Methods	Data Collection Methods
Construction Site Stormwater Runoff Control [Outcome Level 2-3]		
<ul style="list-style-type: none"> • Are the construction sites being managed so that they are in compliance with the corresponding permits, local codes, and ordinances and preventing sediment from leaving the site? <ul style="list-style-type: none"> ○ Are Erosion and Sediment Control BMPs being implemented and maintained? ○ Are any of the construction sites a source of illicit discharges of sediment? <ul style="list-style-type: none"> ▪ If so, are these sites aware of the BMPs that they should be implementing on site, and are these BMPs implemented and maintained? ▪ What are the common issues with BMP implementation that are identified during inspections? 	<p>Descriptive Statistics</p> <ul style="list-style-type: none"> • Total # of sites • # inspections conducted • # and % of sites adequately implementing BMPs • # verified illicit discharges involving sediment from construction sites • # and % of sites requiring follow-up inspection • # and % of sites in compliance pre- and post-follow-up inspection <p>Qualitative Assessment</p> <ul style="list-style-type: none"> • Narrative assessment of common issues with BMP implementation that were identified 	<p>Internal Tracking by Stormwater Program; Site Investigations/Inspections</p> <ul style="list-style-type: none"> • Track inspection results for all sites inspected, including number of initial inspections and follow-up inspections, number and type of BMPs implemented, issues identified • Track illicit discharge source investigation results
Pollution Prevention and Good Housekeeping [Outcome Level 2-3]		
<ul style="list-style-type: none"> • Are Permittee staff aware of the erosion and sediment control BMPs that should be implemented during roads maintenance, and do they understand how to implement them? <ul style="list-style-type: none"> ○ Are Permittee staff attending erosion and sediment control training sessions? 	<p>Descriptive Statistics</p> <ul style="list-style-type: none"> • # training sessions held • # participants <p>Comparison to Established Reference Points; Temporal Change</p> <ul style="list-style-type: none"> • % change in survey results to assess changes in awareness 	<p>Internal Tracking by Stormwater Program</p> <ul style="list-style-type: none"> • Track number of training sessions held and number of participants at each session <p>Surveying</p> <ul style="list-style-type: none"> • Survey Permittee staff regarding awareness of erosion and sediment control BMPs and understanding of how to implement them



5. Program Reporting and Modifications²⁷

GUIDANCE: This section provides more detail on the program management cycle, including conducting EAs and how program modifications may be identified using the results of the EAs.

Beginning in Year 3, the PEAIP will be implemented, and EAs will be conducted each year and submitted along with the Annual Report. The completion of EAs is part of the program management cycle (**Figure 9**) and will, over time, inform program modifications.

During the EA process, the data and information collected to assist in answering the management questions (see **Section 4.3**) will be evaluated. These data will be assessed and/or analyzed using a variety of methods (see **Section 4.1**). The analysis methods to be used to address specific management questions have been identified in **Section 4.3**.

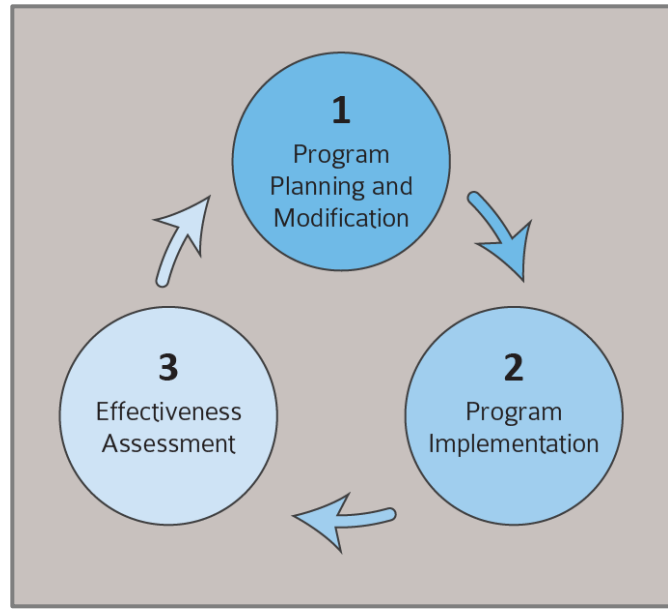


Figure 7. The Program Management Cycle (CASQA, 2015)

The EA may include both written and visual (i.e., tabular, graphical) depictions of the raw data (e.g., inspection data tracked internally by stormwater program) and the analyses that are conducted (e.g., descriptive statistics, qualitative analysis). The results of the analyses will be considered along with the POC-specific management questions. Depending on the availability of historical data, it is expected that more complex trends analyses will occur as part of the long-term EAs.

When EAs are conducted, a few issues (or “problem scenarios”) will be kept in mind when considering cause and effect and evaluating the effectiveness of the prioritized BMPs.²⁸ The issues may be one-to-one, one-to-many, many-to-one, or many-to-many (**Figure 8**). These types of relationships will be taken into consideration when answering management questions and drawing conclusions during the EA process.

²⁷ See 2015 CASQA Guidance Document, Section 7.0 Assessment Tools and Strategies, Section 7.2 Iterative and Adaptive Management, Section 7.3 Assessment Objectives, and Section 8.2 Program Modifications

²⁸ See 2015 CASQA Guidance Document, Section 3.0 Introduction to Strategic Planning for Stormwater Management Programs

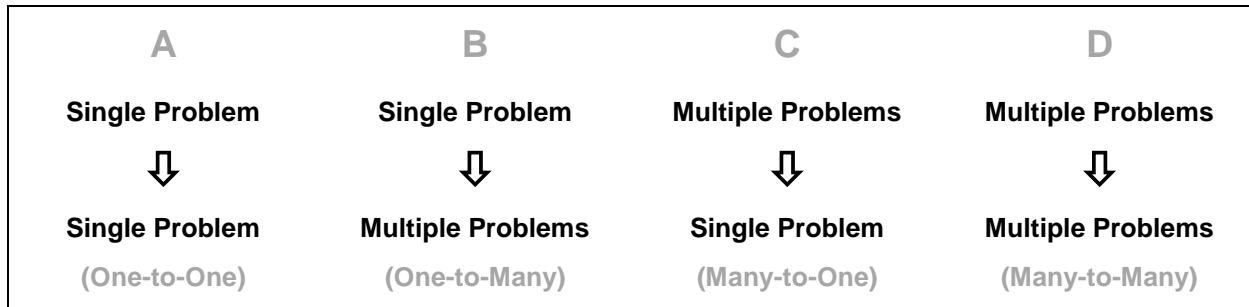


Figure 8. Example Problem Scenarios (CASQA, 2015)

Real-world relationships between outcomes in a typical stormwater management scenario are more likely to exist in complex webs (i.e., scenarios B, C, and/or D in **Figure 8**) than simple, linear chains. For example, a single MS4 discharge might receive contributions from hundreds or thousands of individual sources, varying with time. Multiple education activities might address the same intended behavioral change in a target audience, and only some of them to any effect. In each of these cases, it can be difficult to determine how any individual outcome is actually causing an observed effect or a desired change. Moreover, this effect can be multiplied as an analysis moves through successive layers of outcome levels. This emphasizes the need for focusing resources on the highest priority outcomes first.

The development of “outcome maps” may be used as a tool for determining how to apply specific methods and approaches to each unique assessment situation. Visual representations of the linkages between problem conditions can be extremely valuable (**Figure 9**).

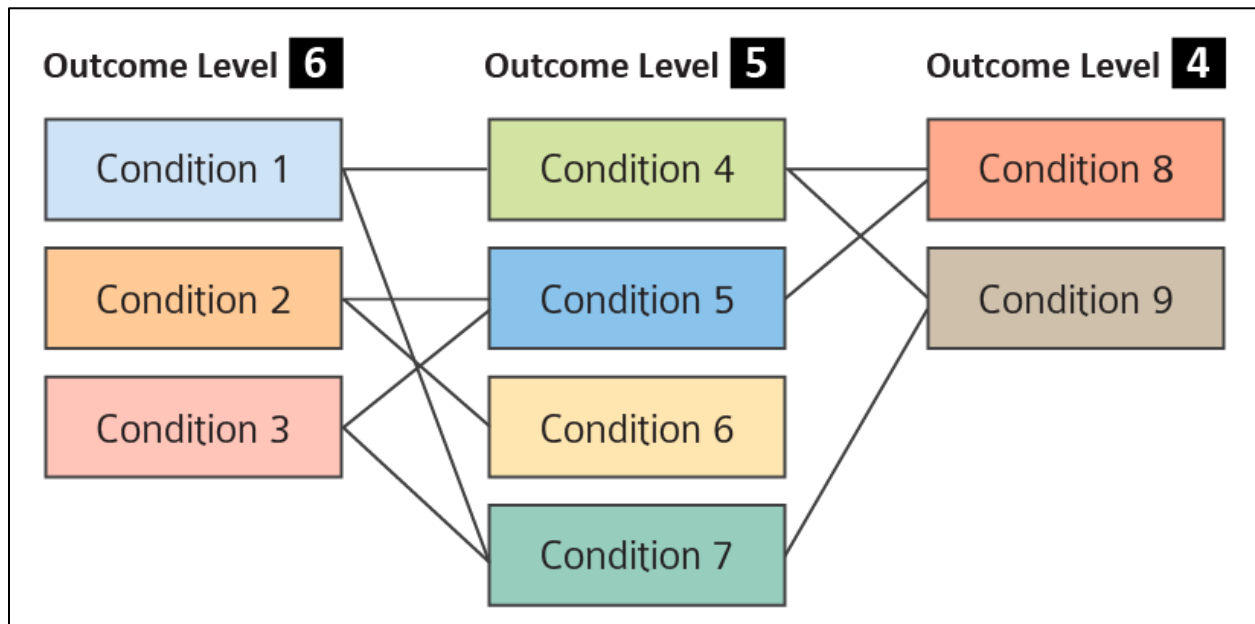


Figure 9. Example Outcome Map (CASQA, 2015)

In conjunction with the long-term EAs that will be conducted beginning with the Annual Report in Year 5, the City of Imperial will review the EAs that have been conducted, as well as recommendations based on the experience of stormwater staff in implementing the program, and identify areas for improvement. The management questions and data collection results will be reviewed and used as the basis for summarizing the short- and long-term progress of the stormwater programs towards reducing the potential impacts of urban runoff on receiving waters. The City of Imperial will identify modifications that may be necessary to improve program effectiveness at reducing pollutant loads, achieving the MEP standard, and protecting water quality.

The City of Imperial will provide a summary identifying the following types of modifications (as applicable):

- Improving upon the PEAIIP by identification of any potential data gaps and/or revisions that may be necessary for the evaluation of the POC-specific management questions;
- Improving upon prioritized BMPs (i.e., key implementation activities) that have not been fully implemented and/or did not achieve the expected result;
- Continuing and expanding upon prioritized BMPs that proved to be effective, including identifying new prioritized BMPs or modifications to existing prioritized BMPs, with the goal of increasing pollutant load reductions;
- Discontinuing BMPs that may no longer be effective; and
- Based upon identification of bridges and barriers, changes in how the City of Imperial intends to provide outreach to target audiences in order to reduce PGAs and increase implementation of prioritized BMPs.

The summary of program modifications will be provided with the fifth year Annual Report and will include the identified priority program areas and the schedule the City of Imperial will follow to complete the identified modifications during the next permit term. By conducting these assessments and modifying the program as needed, the City of Imperial will ensure that the program management cycle is utilized (**Figure 9** and described in **Section 2**).



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Appendix A

GLOSSARY OF TERMS

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Glossary of Terms²⁹

Adaptive Management: Adaptive Management is a structured process of directing decision-making with an aim toward achieving identified goals or milestones and addressing/reducing uncertainty over time.

Assessment Methods: Assessment Methods are processes used to obtain or evaluate assessment data or information. Depending on the particular outcome and/or management questions, numerous assessment methods may be used.

Best Management Practice (BMP): Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollutants discharged to waters of the United States.

California Stormwater Quality Association (CASQA): Since 1989 CASQA has been a leader in the stormwater field. CASQA represents a diverse range of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout the state. The Effectiveness Assessment Subcommittee has provided input and guidance on stormwater program effectiveness assessment issues since 2004; developing a standardized conceptual approach to evaluating municipal program elements in 2007 and updating that approach in 2015.

Effectiveness Assessment (EA): Effectiveness Assessment includes the methods and activities that stormwater managers use to evaluate how well their programs are working, and to identify modifications necessary to improve them. EA is the mechanism by which feedback is evaluated to enable ongoing adaptive management.

Program Management Cycle: The Program Management Cycle broadly divides stormwater program management into three phases:

1. Program planning and modification;
2. Program implementation; and
3. Effectiveness assessment.

Over time, the repeated application of this process—each phase continuously informing the next—should result in the improvement of stormwater programs and the achievement of the desired results that they are designed to achieve.

Maximum Extent Practicable (MEP): The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet.

Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source and/or treatment control BMPs. MEP primarily emphasizes pollution prevention and source control BMPs (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than best available technology or best available. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following

²⁹ The Glossary of Terms is primarily based on the Glossary of Acronyms and Terms in the *Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs*, CASQA 2015

process over time: municipalities propose their definition of MEP by way of the programs set forth in their stormwater management plans/programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes the proposal for MEP as it applies both to overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance).

In the absence of a definition, the State Water Resources Control Board defined MEP as set forth in a memo dated 11 February 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel.³⁰

Municipal Separate Storm Sewer System (MS4)³¹: An MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is:

- Owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.;
- Designed or used to collect or convey stormwater;
- Not a combined sewer; and
- Not part of a Publicly Owned Treatment Works (POTW) (sewage treatment plant).

Outcome Level: The CASQA approach utilizes a series of six categories of outcomes to establish a logical and consistent organizational scheme for assessing and relating individual outcomes. The outcome levels represent a general progression of conditions that are assumed to be related in a sequence of causal relationships.

- **Outcome Level 6 (Receiving Water Conditions):** Level 6 Outcomes describe receiving water conditions. They can apply either to existing conditions or to improvements that will be sought over time through program implementation.
- **Outcome Level 5 (MS4 Contributions):** Level 5 Outcomes may be measured within the MS4, or as discharges from it. Evaluation typically focuses on pollutant concentrations and/or loads. Level 5 Outcomes provide a direct linkage between upstream sources and receiving waters and are a critical expression of program success.
- **Outcome Level 4 (Source Contributions):** Level 4 Outcomes measure reductions in the discharge of pollutants from sources.
- **Outcome Level 3 (Target Audience Actions):** Level 3 Outcomes address the actions of target audiences, and whether or not changes are occurring over time. The major categories of target audience actions are pollutant-generating activities (PGAs); best management practices (BMPs) and supporting behaviors.
- **Outcome Level 2 (Barriers and Bridges to Action):** Level 2 Outcomes provide a means of gauging whether activities are producing changes in the awareness, knowledge, or attitudes of target audiences. Level 2 Outcomes are often used to gauge progress in, or to refine approaches for, achieving Level 3 Outcomes.

³⁰ http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/def_mep_bj_21193.pdf

³¹ Based on the definition in Title 40 Code of Federal Regulations §122.26 (b)(8)

- **Outcome Level 1 (Stormwater Program Activities):** Level 1 Outcomes, which are often defined by specific stormwater permit requirements, address a variety of stormwater program activities. This outcome level measures the *implementation* of the program, not the *impact* that the stormwater program is having.

Phase II MS4 Permit: The Phase II Permit, issued in 1999, requires regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their stormwater discharges. Each regulated MS4 is required to develop and implement a stormwater management program/approach to reduce and/or eliminate the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) and effectively prohibit discharges of non-stormwater into its MS4, unless such discharges are authorized.

Pollutant of Concern (POC): A pollutant that is reasonably expected to be present in urban runoff and may reasonably be expected to affect the designated uses of the receiving water. Urban runoff pollutants of concern may include sediments, non-sediment solids, nutrients, pathogens, oxygen-demanding substances, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, and/or pesticides and herbicides.

Program Element: Program Elements are distinct components of a stormwater program that focus on reducing pollutants from a particular activity or pollutant source/target audience. The Program Elements for the Phase II municipal stormwater program include the following:

- Program Management
- Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction
- Pollution Prevention/Good Housekeeping
- Post Construction
- Water Quality Monitoring

Receiving Water Conditions: Receiving Water Conditions can include any chemical, biological, or physical parameter that can be measured or assessed in receiving waters (i.e., chemical concentrations, dissolved oxygen levels, biological integrity, species diversity, eutrophication, microbiological or toxicological conditions, hydromodification).

Source: “Source” means anything with the potential to generate pollutants prior to their introduction to the MS4. A typical program broadly addresses the following source categories: residential areas, construction and development sites, commercial and industrial sources, and municipal operations. Sources may alternatively be defined by the populations associated with areas, facilities, or activities, e.g., residents, dog-walkers, mobile car washers, or restaurant employees.

Source Contribution: Source Contribution can refer either to a source loading or to a reduction in that loading. Source loadings are the pollutant loadings added by sources to a MS4. Source reductions are changes in the amounts of pollutants associated with specific sources before and after control measures are employed.

Target Audience: A “Target Audience” consists of the people (individuals and populations) that are expected to gain knowledge or engage in the behaviors that a stormwater program is intended to elicit. BMPs and other controls are implemented by many types of third parties, so the term “target audience” is broadly defined and virtually any group of people could be a target audience, including municipal staff members, the general public, elected and appointed officials, other government agencies, etc.



Public Education and Outreach on Storm Water Impacts

Developing programs to increase public awareness and to involve the public can be an effective method for controlling pollution associated with Urban Runoff. The City will create and distribute educational materials and perform outreach to residents and businesses about the impact of polluted Storm Water runoff discharges, and that their actions can make a positive impact on water quality.

Public Education and Outreach Methods

Education materials will focus on illegal dumping, disposal of household hazardous waste and antifreeze, batteries, oil and paint disposal information, lawn and garden maintenance, car washing, fertilizer, pesticide and household chemical use, pet care, and landscape & gardening. All materials will discuss how these items impact the water bodies and the proper disposal methods to prevent stormwater pollution. The following methods will be implemented during specific years.

Year	Methods
2015	<ul style="list-style-type: none">• Develop Storm Water pollution prevention educational materials<ul style="list-style-type: none">○ Brochures○ Pamphlets○ Utility Bill inserts• Distribute educational materials<ul style="list-style-type: none">○ City Hall○ Flyers and posters at Library○ Brochures and pamphlets at Market Days and other special events• Purchase permanent (10 year) storm drain markers (stencils). Begin stenciling storm drains.• Update City website to include stormwater pollution prevention measures
2016	<ul style="list-style-type: none">• Complete stenciling all storm drains• Include educational information on all business license application and water service activation• Conduct public workshops at schools, through the Children's Rainforest program, or through the City's Recreation programs.