Program Effectiveness Strategy

State of Hawaii, Department of Transportation
Highways Division, Oahu District
SWMPP, February 2022

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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION, OAHU DISTRICT

STORM WATER MANAGEMENT PROGRAM
PROGRAM EFFECTIVENESS STRATEGY

MS4 NPDES Permit No. HI S000001

State of Hawaii Department of Transportation
Highways Division, Oahu District
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LIST OF ACRONYMS AND ABBREVIATIONS

AMS	Asset Management System
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
DOH	State of Hawaii Department of Health
DOT-HWYS	State of Hawaii, Department of Transportation, Highways Division, Oahu District
kg/yr	Kilogram per year
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
No.	Number
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
SIS	Site Investigation Sheet
SOP	Standard Operating Procedures
SWMP	Storm Water Management Program
SWPCP	Storm Water Pollution Control Plan
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load

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1. INTRODUCTION

This *Program Effectiveness Strategy* is submitted to satisfy Part G.1.d of the State of Hawaii, Department of Transportation, Highways Division, Oahu District (DOT-HWYS) Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit No. HI S000001, effective September 1, 2020 (hereinafter MS4 NPDES Permit). The MS4 NPDES Permit Part G.1.d requires DOT-HWYS to submit to the State of Hawaii, Department of Health (DOH) a written strategy for determining the effectiveness of the Storm Water Management Program (SWMP) as a part of its *Storm Water Management Program Plan*.

MS4 NPDES Permit Part G Reporting Requirements:

> *Part G.1.d Program Effectiveness Reporting – As part of the SWMP, the Permittee shall submit to DOH a written strategy for determining effectiveness of its SWMP. The strategy shall incorporate the results of water quality monitoring efforts (see Part G.2.) as well as program implementation information and other indicators. The Permittee shall include an assessment of program effectiveness and identification of water quality improvements or degradation beginning with the 2nd Annual Report.*

The *Program Effectiveness Strategy* reflects the evolution from a compliance-based approach by DOT-HWYS to one where systematic program enhancements are made with a method for determining program effectiveness. This document introduces and discusses key concepts, and defines standard terminology used in developing the comprehensive framework to assess the effectiveness of the SWMP. Furthermore, this document outlines the approach that DOT-HWYS utilizes to adaptively manage the SWMP to improve effectiveness of Best Management Practices (BMPs) in reducing pollutants of concern, thereby achieving the maximum extent practicable (MEP) standard and the protection of water quality.

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2. STRATEGY

The Program Effectiveness Strategy incorporates elements of the California Stormwater Quality Association (CASQA) guidance documents, *A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs* (2015) and *An Introduction to Stormwater Program Effectiveness Assessment* (2007). The approach is built on CASQA's Outcome Levels framework, assessment methods, analytical methods, and targeted outcomes.

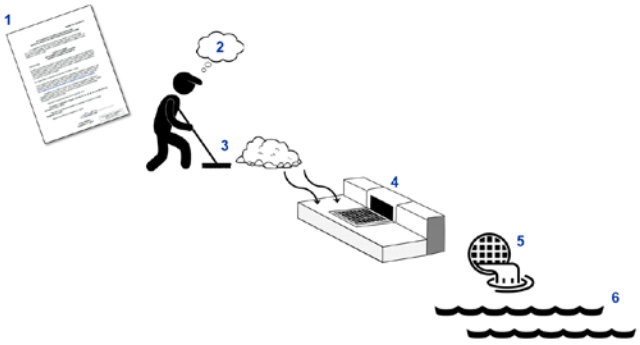
2.1 Storm Water Outcome Levels

The ultimate goal of any SWMP is water quality improvement, and the Outcome Levels reflect the relationship between an activity and its effect on water quality. Assessment outcomes are grouped into six levels and represent a gradation from activity-based to water-quality based outcomes. The Outcome Levels consist of:

(1) Permit Compliance
(2) Knowledge and Awareness
(3) Behavioral Changes
(4) Load Reductions
(5) MS4 Discharge Quality
(6) Receiving Water Quality

The Outcome Levels may generally be seen as degrees of separation from tangible water quality benefits and assessments should be conducted at the highest Outcome Level supported by data.

In general, Levels 1 through 4 may be considered *Indirect Outcomes*, as these outcomes are often assigned to implementation activities that may have a correlation with water quality improvement and serve as a proxy for water quality, but have no direct causal relationship. Levels 4 through 6 are considered *Direct Outcomes* as these outcomes demonstrate a direct, measurable effect on water quality.



Gradation of activity-based to water-quality based outcomes: Outcome Levels 1 through 6.

Note that Outcome Level 4 may be considered either an Indirect or Direct Outcome, as in certain situations a causal relationship may be established between a Level 4 outcome and water quality benefits.

Also note that each Outcome Level has value in informing management decisions, and the achievement of Outcome Level 6 may not be possible for every control measure. For example, in many instances Outcome Levels 2 or 3 may be sufficient for the effectiveness evaluation of outreach or training program implementation.

Outcome Level 1: Permit Compliance. Many program activities are conducted as a direct requirement of the MS4 NPDES Permit and therefore, Level 1 outcomes may take the form of a simple yes/no answer. Examples include developing a *Public Education and Outreach Plan* or maintaining an inventory of construction sites. Level 1 outcomes are assumed to be beneficial to water quality, but are not considered Direct Outcomes as it lacks the causal effect to support this assumption.

Outcome Level 2: Knowledge and Awareness. Outcomes at this level gauge whether educational efforts are progressing toward changes in knowledge and awareness. Measuring these outcomes is achieved through various methods including surveys and quizzes; and may be inferred through observation of public involvement such as counting the number of website visits, social media impressions, training attendees, and number of connections permits issued. Similar to Outcome Level 1, Level 2 outcomes are assumed to be beneficial to water quality but are considered Indirect Outcomes.

Outcome Level 3: Behavioral Changes. Level 3 outcomes measure the effectiveness of programs in motivating target audiences to change their behaviors and implement appropriate BMPs. These behavioral changes are tracked using surveys (e.g., public education surveys), site inspections (e.g., number of construction site deficiencies), and tabulating changes in program involvement (e.g., percentage of commercial facilities conducting corrective actions on time). Outcomes at Level 3 are considered Indirect Outcomes.

Outcome Level 4: Load Reductions. Outcomes at Level 4 quantify reductions in pollutant loads from sources after a BMP has been implemented. These outcomes include load reductions such as debris collected from street sweeping, volume of trash removed from Adopt-A-Highway, and volume of discharge prevented by implementing spill prevention and response procedures. Outcome Level 4 data should be analyzed temporally to provide feedback on the effectiveness of BMPs implemented. As a causal relationship between load reductions and water quality improvements may or may not be identified, Level 4 outcomes may either be considered an Indirect Outcome or Direct Outcome.

Outcome Level 5: MS4 Discharge Quality. The primary goal of the SWMP is to reduce pollutants in storm water runoff to the MEP, and ensure that discharges do not cause or contribute to exceedances in water quality standards in receiving waters. As such, Level 5 outcomes are the most direct measure of program effectiveness and are considered a Direct Outcome. Level 5 outcomes measure reductions in one or more pollutant of concern discharging from the DOT-HWYS MS4.

Outcome Level 6: Receiving Water Quality. Level 6 outcomes may be expressed through compliance with regulatory benchmarks or water quality standards, Total Maximum Daily Load implementation, protection of biological integrity, and other monitoring assessments. Receiving water quality is dependent on a watershed approach and relies upon partnerships with other agencies, land owners, and stakeholders, and may take years to establish a reliable data set.

2.2 Data Collection

The Outcome Level descriptions in Section 2.1 identify several methods for data collection. Data collection and subsequent analysis are important to consider in the design of Enhanced BMPs. The term *Enhanced BMP* is utilized throughout this document to identify a practice or program that is systematically targeted for improvement. Examples of enhancements include increasing the frequency of an activity, revising a practice, implementing a new training, or updating a plan.

A variety of data collection approaches and assessment methods are available to evaluate the performance of BMPs implementation activities, program elements, and short- and long-term goals.

Data collection methods may be broadly categorized into the following approaches provided by CASQA, as shown in Table 1.

Table 1. Approach to Data Collection (CASQA, 2007).

Approach to Data Collection (CASQA, 2007)	
Approach	**Description**
Confirmation	This approach consists of documenting whether an activity or task has been completed. This is often expressed as a positive or negative outcome. This assessment method should be exclusively used for Outcome Level 1 activities.
Tabulation	Tabulation is a simple accounting method and may be expressed in both absolute numbers and in relative percentages. Tabulations is a common assessment method and useful for Outcome Levels 1 through 3.
Surveying	Surveying is comprised of a variety of methods, including interviews designed to discern the knowledge, attitudes, awareness, or behaviors of a target audience. Surveys are applicable for Outcome Levels 2 and 3.
Quantification	Quantification applies to efforts to quantify reductions in loading or runoff discharges. Quantification is most applicable to Outcome Levels 4 through 6.
Inspections	Site inspections and audits are common tools used to verify compliance or gather additional data by observations, record reviews, and sampling. Inspections are commonly used for Outcome Levels 3 through 5.
Reporting	Reporting includes receipt of implementation, compliance, or other assessment-related information by external parties.
Monitoring	Monitoring is the measurement of environmental or water quality conditions. Monitoring may be achieved through sampling or through observation. Monitoring methods apply exclusively at Outcome Levels 4 through 6.

2.3 Data Analysis

Data analysis involves the selection of the appropriate analytical method to evaluate the effectiveness of an Enhanced BMP.

A common mistake that can severely limit the explanatory value of the data is the failure to identify specific analytical approaches up front. Specificity is critical, and the choice of the analytical method may dictate what specific metrics to use, how the data may be collected, and the quality of the results. Analytical methods may be qualitative or quantitative, but all outcomes should have one analytical method associated with them.

CASQA provides these general approaches to data analysis.

Table 2. Approach to Data Analysis (CASQA, 2015).

Approach to Data Analysis (CASQA, 2015)	
Qualitative Assessment	Confirmation: Confirmation (Yes/No) that a program activity was in operation during the year or that a plans or materials were made available. Completion: Confirmation (Yes/No) a specific task was completed.
Descriptive Statistics	Numbers that are used to summarize and describe data. This includes statistical counts, averages, and variance.
Comparison to Reference Points	Comparison to an established reference point includes established targets such as benchmarks, waste load allocations, water quality standards, and targeted outcomes; or other reference points such as other MS4 programs, previous results, baseline values, etc.
Temporal Change	The most general goal of trend analysis is to look at data over time to discern whether or not a given indicator has increased or decreased over time, and if it has, how quickly or slowly the increase or decrease has occurred.
Spatial Analysis	Spatial analysis allows comparisons between watersheds or other geographic areas. The ability to conduct spatial analysis is generally limited by the availability or appropriate data for spatial characteristics.

2.4 Targeted Outcomes

Establishing targeted outcomes will identify desired changes and the specific strategies to develop to achieve those changes. Targeting creates a context for establishing measurability, interpreting results, and evaluating success over time. The upfront identification of applicable data requirements will ensure that outcomes are measurable and can be analyzed once resultant data is available.

Deciding on where to set the targeted outcomes is challenging. Management questions form the basis for the types of data that must be gathered and evaluated. The types of questions to formulate include evaluating relationships of data between Outcome Levels and/or in relation to geospatial area, land use, target audience, or time interval.

CASQA provides these general elements to consider in establishing a targeted outcome.

Table 3. Approach to Establishing Targeted Outcomes (CASQA, 2015).

Approach to Establishing Targeted Outcomes (CASQA, 2015)	
Elements	**Examples**
• The **direction** of change.	• Increase or decrease
• The **nature** of the outcome.	• Hotline calls received, chemical concentration
• The **metric** (magnitude + unit) of the change.	• 20 people, 50%, 3.0 mg/L, 30 lbs.
• The **reference point** from which change is measured.	• Existing or baseline levels, previous results, results at another location
• The **timeframe** for achieving the change. This may include time elapsed or a period of time.	• Hours, days, months, years, reporting period, permit cycle

When crafting a targeted outcome statement, start with a general outcome statement then add specifics as follows:

[Direction] in [Nature] by [Metric] over [Reference Point] by [Timeframe].

For example, a targeted outcome for the Industrial and Commercial Program Training *Enhanced BMP* could be as follows:

[Increase] in [test results from Training] to [80% score average] by [end of the permit term].

3. METHODOLOGY AND APPROACH

In applying the *Program Effectiveness Strategy* to BMPs enhancements, DOT-HWYS seeks to establish a methodological approach that considers the data collection and analysis needs during the initial design. Establishing whether BMPs meet the MEP criteria is feasible only if sound design creates a feedback mechanism on effectiveness.

The methodology is a systematic approach to evaluate BMPs for enhancement and subsequently assess its effectiveness. The BMP evaluation is a three-part exercise to: (1) assign Outcome Levels to existing BMPs; (2) select Program BMPs to enhance; and (3) establish targeted outcomes based on identified assessment parameters.

3.1 Assign Outcome Levels

First, DOT-HWYS completed a comprehensive review of the existing BMPs implemented. For each BMP, DOT-HWYS assigned an Outcome Level, selected the data collection method, and identified the assessment parameters for analysis.

The following tables detail the BMP evaluations for each program.

Table 4. Public Education and Outreach Program BMPs.

MS4 NPDES Permit Part	Public Ed & Outreach BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.a	Public Education and Outreach Plan	(1) Permit Compliance	Completion	Permit compliance
D.1.a.(1)	Target Groups	(1) Permit Compliance	Completion	Permit compliance
D.1.a.(2)	Adopt-A-Highway Program	(4) Load Reductions	Tabulation Quantification	No. volunteer organizations Cubic yards of trashed removed
D.1.a.(2)	Websites	(2) Knowledge and Awareness	Tabulation	No. of website visits

MS4 NPDES Permit Part	Public Ed & Outreach BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.a.(2)	Social Media	(2) Knowledge and Awareness	Tabulation	No. of followers and likes on social media
D.1.a.(2)	School Programs	(2) Knowledge and Awareness	Tabulation Tabulation Tabulation	No. of students presented to No. of activity books distributed No. completed quizzes
D.1.a.(2)	Public Outreach Events	(2) Knowledge and Awareness	Tabulation	No. of event attendees
D.1.a.(2)	Other Display Materials	(2) Knowledge and Awareness	Tabulation	No. of materials distributed
D.1.a.(3)	Storm Water Awareness Surveys	(3) Behavioral Changes	Survey	Average behavior score

Table 5. Public Involvement/Participation Program BMPs.

MS4 NPDES Permit Part	Public Involvement BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
A.6	Public Review and Comment	(1) Permit Compliance	Confirmation	Permit compliance
D.1.b	Storm Water Management Program Plan	(1) Permit Compliance	Completion	Permit compliance

Table 6. Illicit Discharge Detection and Elimination Program BMPs.

MS4 NPDES Permit Part	IDDE BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.c.(1)	Connection Permits	(2) Knowledge and Awareness	Tabulation	No. of connection permits issued
D.1.c.(2)	Outfall Field Screening	(3) Behavioral Changes	Tabulation	Percentage of outfalls with identified dry weather flows
D.1.c.(3)	Track Cases in AMS Maximo	(1) Permit Compliance	Confirmation	Permit compliance
D.1.c.(4)	Investigate Illegal Connections and Illicit Discharges	(3) Behavioral Changes	Tabulation Tabulation	No. of complaints investigated No. of public complaints
D.1.c.(5)	Enforcement	(3) Behavioral Changes	Tabulation	Enforcement on-time response percentage
D.1.c.(6)	Spill Prevention and Response	(4) Load Reductions	Quantification	Gallons of discharge prevented from entering MS4
D.1.c.(7)	Facilitate Disposal of Used Oil and Toxic Materials	(1) Permit Compliance	Confirmation	Permit compliance
D.1.h.(1)	Training	(2) Knowledge and Awareness	Tabulation Survey/Quiz	No. of training attendees Average Quiz Score

Table 7. Construction Site Runoff Control Program BMPs.

MS4 NPDES Permit Part	Construction BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.d.(1)	Construction BMP Implementation	(1) Permit Compliance	Completion	Permit compliance
D.1.d.(2)	Inventory of Construction Sites	(1) Permit Compliance	Confirmation	Permit compliance
D.1.d.(3)(i) D.1.d.(3)(iii) D.1.d.(4)(i)	Construction NPDES Review and Approval Process	(3) Behavioral Changes	Tabulation Tabulation	No. of projects with plans reviewed No. of permits with plans reviewed
D.1.d.(3)(ii)	Connection and Discharge Permits Associated with Construction Activities	(2) Knowledge and Awareness	Tabulation	No. of connection and discharge permits issued
D.1.d.(3)(iv)	Plan Review Checklist	(1) Permit Compliance	Completion	Permit compliance
D.1.d.(4)(ii)	Public Construction Project Inspections	(3) Behavioral Changes	Tabulation	No. of deficiencies (critical, major, minor)
D.1.d.(4)(iii)	Private Construction Project Inspections	(3) Behavioral Changes	Tabulation	No. of deficiencies (critical, major, minor)
D.1.d.(4)(ii) D.1.d.(4)(iv)	Inspection Form(s), Inspection Checklist, and Reporting and Corrective Procedures	(1) Permit Compliance	Completion	Permit compliance
D.1.d.(5) D.1.d.(6)	Enforcement	(3) Behavioral Changes	Tabulation	Average days to corrective action (critical, major, minor)
D.1.h.(2)	Training	(2) Knowledge and Awareness	Tabulation Survey	No. of training attendee Average questionnaire score

Table 8. Post-Construction Storm Water Management in New Development and Significant Redevelopment Program BMPs.

MS4 NPDES Permit Part	Post-Construction BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.e.(1)	Design Standards	(1) Permit Compliance	Completion	Permit compliance
D.1.e.(2)	Review of Plans for Post-Construction BMPs	(2) Knowledge and Awareness	Tabulation Tabulation	No. of projects reviewed for post-construction BMP inclusions No. of projects required inclusion of post-construction BMPs
D.1.e.(3)	Post-Construction BMPs Inspection and Maintenance Database	(4) Load Reductions	Quantification	Cubic yards of debris removed
D.1.h.(3)	Training	(2) Knowledge and Awareness	Tabulation	No. of training attendees

Table 9. Pollution Prevention/Good Housekeeping – Debris Control Program BMPs.

MS4 NPDES Permit Part	Debris Control BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.f.(1)(i)	Asset Management System	(2) Knowledge and Awareness	Tabulation	No. of structure additions/deletions
D.1.f.(1)(ii)(a)	Street Sweeping	(4) Load Reductions	Quantification	Cubic yards of debris removed
D.1.f.(1)(ii)(b)	Storm Drain Inspection and Cleaning	(4) Load Reductions	Quantification	Cubic yards of debris removed
D.1.f.(1)(iii)	Storm Drain Placard Installation Program	(2) Knowledge and Awareness	Tabulation	Public education survey awareness results
D.1.f.(1)(iv)	Action Plan for Retrofitting Structural BMPs	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(1)(v)	Trash Reduction Plan	(5) MS4 Discharge Quality	Quantification	Cubic yards of debris discharged from MS4

Table 10. Pollution Prevention/Good Housekeeping – Chemical Applications Program BMPs.

MS4 NPDES Permit Part	Chemical Applications BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.f.(2)(i)	Chemical Applications BMPs	(3) Behavioral Changes	Tabulation	Gallons of herbicide applied
D.1.f.(2)(i)	Authorized Use List	(1) Permit Compliance	Completion	Permit compliance
D.1.h.(4)	Training	(2) Knowledge and Awareness	Tabulation	No. of training attendees

Table 11. Pollution Prevention/Good Housekeeping – Erosion Control Program BMPs.

MS4 NPDES Permit Part	Erosion Control BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.f.(3)(i)	Permanent Erosion Control Improvements	(4) Load Reductions	Quantification	Pollutants removed (kg/yr)
D.1.f.(3)(ii)	Temporary Erosion Control BMPs	(4) Load Reductions	Quantification	Cubic yards of debris removed
D.1.f.(3)(iii)	Highway Manual for Sustainable Landscape Maintenance	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(3)(iv)	Action Plan to Address Erosional Outfalls	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(3)(v)	Identification of Significant Erosional Areas	(1) Permit Compliance	Confirmation	Permit compliance

Table 12. Pollution Prevention/Good Housekeeping – Maintenance Activities BMPs Program BMPs.

MS4 NPDES Permit Part	Maintenance BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.f.(4)	Maintenance Activities BMPs	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(5)	Flood Control Project	(1) Permit Compliance	Confirmation	Permit compliance
D.1.h.(5)	Training	(2) Knowledge and Awareness	Tabulation	No. of training attendees

Table 13. Industrial and Commercial Activities Discharge Management Program BMPs.

MS4 NPDES Permit Part	IC Activities BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
D.1.g.(1)	Connection and Discharge Permits	(2) Knowledge and Awareness	Tabulation	No. of connection and discharge permits issued
D.1.g.(2) D.1.g.(3)	Industrial and Commercial Facilities Inventory	(1) Permit Compliance	Completion	Permit compliance
D.1.g.(4)	Priority Area Plan	(1) Permit Compliance	Completion	Permit compliance
D.1.g.(5)	Industrial and Commercial Inspection Program	(3) Behavioral Changes	Tabulation	Percentage of reinspected facilities resulting in deficiencies
D.1.g.(5)	Commercial Facility Ranking	(1) Permit Compliance	Confirmation	Permit compliance
D.1.g.(6)	SWPPP Review and Acceptance	(2) Knowledge and Awareness	Tabulation Tabulation	No. of SWPPPs reviewed Industrial Facilities without NPDES reported to DOH
D.1.g.(7)	Enforcement	(3) Behavioral Changes	Tabulation	Enforcement on-time response percentage
D.1.h.(6)	Training	(2) Knowledge and Awareness	Tabulation Survey	No. of training attendees Average quiz score

Table 14. Baseyard Facilities Program BMPs.

MS4 NPDES Permit Part	Baseyard Facilities BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
E.1	SWPCPs Implementation	(1) Permit Compliance	Completion	Permit compliance
E.2	Baseyard Inspections	(3) Behavioral Changes	Tabulation Tabulation	No. of deficiencies Percentage of on-time response for corrective action
E.3	NOIs	(1) Permit Compliance	Completion	Permit compliance

Table 15. Monitoring Program BMPs.

MS4 NPDES Permit Part	Monitoring BMPs Implemented	Outcome Levels	Data Collection Method	Assessment Parameters
F.1.a F.1.b	Annual Monitoring Plan	(1) Permit Compliance	Completion	Permit compliance
F.3	TMDL Implementation	(4) Load Reductions	Quantification	Pollutants removed (kg/yr)
F.4	Other TMDLs	(1) Permit Compliance	Completion	Permit compliance

3.2 Select BMPs To Enhance

From the list of existing BMPs implemented, DOT-HWYS selects the Program BMPs to target for enhancements. BMPs targeted for enhancements are selected to address a prioritized problem, achieve a program goal, or to capitalize on an opportunity.

To track progress in meeting the targeted outcomes, metrics are developed to assure that an assessment can be made. When selecting a data collection method, a spectrum of targeted outcomes, programmatic outcomes, and data gap resolution goals are considered. This step is critical to conduct the desired analysis, and report on the goals and metrics during the next step.

Table 16. Example of Industrial and Commercial Program BMPs Selected for Enhancement.

Industrial and Commercial Program BMPs Enhancements			
Program BMPs	Enhancements	Outcome Levels	Data Metrics
Industrial and Commercial Inspection Program	Update Industrial and Commercial SIS Checklist	1	Completion
Enforcement	Update Enforcement SOP	3	Tabulation

3.3 Establish Targeted Outcomes

After the Enhanced BMPs are selected, DOT-HWYS utilizes the Assessment Strategy Worksheet to establish targeted outcomes and an implementation timeline. The Assessment Strategy Worksheet guides the selection of targeted outcomes, performance standards, and metrics that may be used to assess effectiveness of programs and define measurable goals.

The Assessment Strategy Worksheet is also the tool DOT-HWYS utilizes as a feedback mechanism when Items 10 Evaluation of Assessment Results and Item 11 Use of Data are completed on the worksheet.

Table 17 shows an example of an Assessment Strategy Worksheet.

Table 17. Assessment Strategy Worksheet with Enhanced BMP Example.

ASSESSMENT STRATEGY WORKSHEET FY21	
SWMP Program: Industrial and Commercial Activities Discharge Management Program	Date: 1/27/2020 Code: IC5-FY21 Enhanced BMP MS4 Permit Part: Part D.1.g.(7) AR 20–21 Section: 11.1.7 ☒ Single BMP ☐ Applicable to Program BMPs: Outcome Level: 3 Track: Initial, Date, Items, Status: AJ 5-7-20: Item 9. AH 2-24-21: Items 10, 11, and Next Actions.
1. Review SWMP *Program Effectiveness Strategy*. *See Chapter 3 Methodology and Approach, Section 3.1.*	
2. Review the Program BMPs tables with Outcome Levels assigned to each BMP, the data collection methods, and assessment parameters.	
3. Select BMP to enhance: *Enforcement* Update Enforcement SOP.	
4. Establish a targeted outcome to determine effectiveness: [Direction of change] *of* [BMP] *by* [Metric units] *over* [Reference Point] *by* [Timeframe]. Increase percentage of enforcement responses received on time to 90% by June 30, 2021.	
5. Identify approach to data collection: ☐ Confirmation ☒ Tabulation ☐ Survey/Quiz ☐ Quantification ☐ Inspections ☐ Reporting ☐ Monitoring Identify if data is currently tracked or will need to be tracked (and if so describe tools needed to track): Enforcement response time is currently tracked in AMS Maximo.	
6. Identify analytical method for data collection: ☐ Qualitative Assessment ☒ Statistics ☒ Comparisons ☐ Temporal Change ☐ Spatial Analysis Provide a brief description of the analytical method: Count enforcement responses received on time and compare results over time.	
7. Timeline for Implementation: ☐ Days ☐ Months ☐ Years ☒ Reporting Period ☐ Permit Cycle ☐ Other A. Pre-Activity Preparation: Update Enforcement SOP. B. Tasks and Activities: Implement in 2020. C. Post-Activity and Tracking: Compare results in 2021 to previous years.	
8. Execution:	a. Start Date: January 1, 2020 — b. End Date: June 30, 2021 c. Interim Milestones Dates, as applicable: 6/30/20 – Update Enforcement SOP. 12/31/20 – Implement revised Enforcement SOP. 6/30/21 – Identify percentage of enforcement responses received on time.

9. Write summary paragraph for Future Enhanced BMP:

Summary paragraph has 5 sentences: (1) Identify the Future Enhanced BMP. (2) Explain the Outcome Level. (3) Identify the metrics used. (4) State anticipated start date. (5) Discuss Future Enhanced BMP measurable goal.

DOT-HWYS will revise the Enforcement SOP to increase the NOV issue by date from 7 days to 14 days of the date of inspection. This increased timeframe gives DOT-HWYS more flexibility to compile the report, and will benefit the facility receiving the NOV by initially allowing them more time to respond, even though their response due by date will remain 20 days from NOV issuance.

Enforcement response time is currently tracked in AMS Maximo. DOT-HWYS will count enforcement responses received on time and compare results over time.

DOT-HWYS assesses this Future Enhanced BMP at Outcome Level 3. The enforcement response times will be tracked in Excel against a benchmark. The targeted outcome for this enhanced BMP is to achieve an on-time response rate of 90%.

10. Evaluation of Assessment Results: *Write your evaluation.*

The Enforcement SOP was updated on January 15, 2020, to increase the NOV issue by date from 7 days to 14 days. In addition to increasing the issue by date, DOT-HWYS transitioned to sending electronic enforcement letters. The increased timeframe provides DOT-HWY more flexibility to compile the report and benefits the facility receiving the NOV by initially allowing them more time for corrective action.

BMP Effectiveness

DOT-HWYS assesses this Future Enhanced BMP at Outcome Level 3. The increased timeframe and transition to sending electronic enforcement letters together resulted in a 100% enforcement on-time response rate, which surpasses the measurable goal of a 90% on-time response rate. The increased on-time response rate demonstrates the effectiveness of this Enhanced BMP.

11. Use of Data: *Based on results of the BMP assessment, the Program may be modified to:*

- ☐ Continue Enhanced BMP activities.
- ☐ Improve activities that did not accomplish goals.
- ☐ Discontinue efforts that may no longer be productive.
- ☒ Expand upon efforts that proved to be effective.
- ☐ Shift priorities for more effective use of resources.
- ☐ Other: _____
- ☐ Close: Initials _____ Date _____

Next Action(s):

Update Enforcement SOP to allow facilities to correct deficiencies prior to issuing an enforcement letter.

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4. PROGRAM EFFECTIVENESS REPORTING

The evolution of the DOT-HWYS SWMP through the iterative process of program planning, program implementation, and effectiveness assessment is documented in the Annual Report that DOT-HWYS prepares and submits to DOH. The Annual Report sections for each Program chapter generally follows the format below.

Section 1. Program Implementation of BMPs

This section provides a table that cross references the following program elements: MS4 NPDES Permit regulations, SWMP Plan language, the BMPs requirements, and the Annual Report Section. This section briefly describes the BMPs implemented for each program.

Section 2. Program BMPs Assessment

This section reports on the data collected for activities performed during the reporting period to meet MS4 Permit requirements.

2.1. BMP Assessment Metrics

Presented in a table format, this subsection documents the performance of all Program BMPs in comparison to the assessment parameters established in the *Program Effectiveness Strategy* Section 3.1.

2.2. Enhanced BMPs

This subsection highlights the implementation of Enhanced BMPs and evaluates the assessment results.

Section 3. Future Activities

This section describes the planned activities, as well as specific measurable goals to be met in the next reporting period.

3.1. Continue Implementation of BMPs

This subsection identifies the BMPs that will not be enhanced in the next reporting period, but will continue to be implemented as described in the SWMP Plan.

3.2. Future Enhanced BMPs

This subsection details the BMPs targeted for enhancement in the next reporting period, and identifies the data collection and data analysis methods that will be utilized.

REFERENCES

State of Hawaii Department of Transportation, Highways Division, Oahu District. 2020. Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit No. HI S000001, effective September 1, 2021. Honolulu, Hawaii.

California Stormwater Quality Association. 2015. *A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs.* URL: https://www.casqa.org/resources/effectiveness-assessment/guidance-documents/strategic-approach

California Stormwater Quality Association. 2007. An Introduction to Stormwater Program Effectiveness Assessment.