MS4 Program Evaluation Guidance

U.S. Environmental Protection Agency Office of Wastewater Management

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1. Introduction and Background

1.1 Overview

Purpose of the Guidance

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Program Evaluation Guidance (Guidance) is intended to assist State and NPDES permitting authority staff to:

- Assess the compliance and effectiveness of Phase I and Phase II MS4 programs;
- Develop Phase II MS4 stormwater management programs (SWMPs);
- Assess pollutants of concern;
- Provide technical assistance.

TIP:

The questions and issues addressed in this MS4 Evaluation Guidance are intended to be used as a reference during an MS4 program evaluation, not as a script or checklist during the review.

Each evaluation should be customized to the issues and requirements specific to that MS4.

Unlike NPDES industrial wastewater permits which typically contain specific end-of-pipe effluent limits based on water quality standards or available treatment technology, MS4 permits usually include programmatic requirements involving the implementation of **best management practices** (BMPs) in order to reduce pollutants discharged to the "maximum extent practicable" (MEP). In addition, the permittees often are allowed flexibility in the types of BMPs and activities implemented to meet permit requirements. This flexibility, as well as the multifaceted nature of the requirements, makes it difficult to evaluate the effectiveness of MS4 stormwater programs. The purpose of this Guidance is to provide NPDES permitting authority staff the information and questions necessary to conduct a comprehensive MS4 program evaluation and determine if the permittee is implementing the program in order to reduce pollutants discharged to the MEP. This Guidance is not intended to be used as a checklist, rather as a reference to prepare for and conduct an MS4 evaluation. The evaluator must ultimately rely on personal experience and **best professional judgment** (BPJ) to conduct a comprehensive MS4 program evaluation.

An MS4 program evaluation is ultimately based on the requirements in the MS4 permit and commitments made in the stormwater management program (SWMP). These should serve as the primary references for a specific MS4 program evaluation, with this Guidance used as a tool to help assess compliance with the SWMP Plan and the permit. The evaluator may also recommend additional activities that should be conducted by the permittee to improve the SWMP. The term evaluation can refer to an audit, inspection or screening process depending on the level of detail utilized. These terms are defined under "Common Terms" below.

It is important to keep in mind that this Guidance is not an enforcement "how to" document, but can be used to *assist* in the enforcement process by describing a process for consistently and accurately assessing and documenting the compliance status of permittees based on permit or SWMP requirements. Notes, checklists, and reports developed as a result of an evaluation will be helpful when justifying and generating enforcement actions.

TIP:

Permittees may find this Guidance useful in conducting a self-audit to identify and proactively address issues.

Intended Audience

This Guidance is written for State and EPA staff responsible for NPDES MS4 permit issuance, compliance and inspections.

Permittees may also find the information in this Guidance useful in conducting a self-audit to improve the effectiveness of their SWMP.

Resources:

Information regarding permitting authorities or other NPDES information can be found at www.epa.gov/npdes/stormwater

Objective Evaluation

This Guidance is intended to provide information to evaluators to help them objectively evaluate if the permittee is implementing the SWMP to the MEP. This is going to vary from state to state and by permittee. For example, some states have requirements that go beyond the federal regulations, or have state programs or policies that affect the way in which certain requirements are articulated in a permit. In addition, individual NPDES MS4 permits may provide some details on the type of program elements the permittee must implement, but not describe in detail all activities necessary to implement each element. Typically these permits require that the permittee's SMWP Plan include this detail, however, and be submitted for approval. Or permits may specify goals or performance standards that the permittee must meet and then require them to develop the necessary program components to reach those goals or standards and describe them in their SWMP.

Each permittee may have a different approach to complying with a specific permit requirement based on MS4-specific traits or issues. For example, EPA regulations require permittees to develop "procedures for site inspection and enforcement" for addressing construction activities. MS4 permits will likely elaborate on this requirement in more detail, such as by specifying a minimum frequency for inspection. However, few MS4 permits will specify how the permittee should inventory their active construction projects or track enforcement activities. A permittee with only a few construction projects a year may be able to use a paper system to inventory and track construction projects. A permittee with hundreds or thousands of construction projects would likely need a database or similar electronic tracking system to ensure it was implementing the program to the MEP.

Some MS4 permits will not include any specific requirements at all and will only generally dictate that the required MS4 SMWP components are developed and implemented. These MS4 programs are often the hardest to objectively evaluate because there is no prescribed benchmarks to measure against. In these cases, the evaluator will need to subjectively assess the MS4's SWMP program against the intent of the associated regulations to reduce pollutants to the MEP. Evaluation techniques and tools (i.e. checklists) may need to be altered in these cases to best ascertain and assess the effectiveness and compliance status of such a program.

Common Terms

For purposes of this guidance, it is important to note that the term "evaluation" is generally used to define any assessment of an MS4 program. Evaluations are further defined as either "inspections", "audits", or "screenings" depending upon the level of review performed. These and other common terms used throughout this Guidance are defined as follows:

- Audit—comprehensive evaluation of all components of an MS4 program to assess overall implementation and identify problems
- MS4—the municipal separate storm sewer system (full text definition included in Appendix A); can refer to the conveyance system in addition to the jurisdiction(s) which own/operate the system.
- Permittee—the permitted owner/operator(s) of the MS4; the entity being evaluated
- Evaluation—any screening, audit or inspection of an MS4 program
- Evaluator—the NPDES permitting authority staff person who is conducting the evaluation of the MS4 program

- Inspection—focused evaluation of specific components of an MS4 program to verify compliance with permit requirements
- Municipal permittee—a general reference to a municipality that is the owner/operator of an MS4 and is covered by an NPDES MS4 permit
- Permit Area—Geographic area covered by the MS4 permit
- Permitting Authority—the State or EPA Region authorized to issue NPDES permits
- Screening—evaluation method used to get a basic impression of a program or uncover "red flags;" may be used as a precursor to a program evaluation
- Stormwater Management Program, or SWMP—the stormwater management program implemented by the permittee; also referred to as the "program"
- SWMP Plan—the document often used by permittees to document SWMP elements implemented or planned

How to Use this Guidance

The first part of this Guidance includes background information useful for review. Subsequent sections lead the evaluator through a series of steps to conduct an evaluation, which can be categorized into three parts: Advance Preparation, Conducting the Evaluation, and Post-Evaluation Activities.

The section titled "Conducting the Evaluation" is divided into subsections that describe in depth how to evaluate overall program management as well as each of the major SWMP components:

- MS4 public education and participation
- MS4 maintenance activities
- Construction activities
- Post-construction controls
- Industrial/commercial facilities
- Illicit discharge detection and elimination

For each subsection, the following information is provided:

- A description of regulatory requirements
- Resources for more information
- Common activities related to the SWMP component
- Materials to review prior to the evaluation
- Elements to address and questions to ask during the evaluation
- A description of any recommended in-field evaluation activities
- Common issues identified during evaluations

In addition, a glossary as well as multiple worksheets and checklists have been included in appendices as tools for the evaluator to prepare for and conduct an MS4 SWMP evaluation.

Appendix A—Glossary & Acronym List
Appendix B—Evaluation Worksheets

Appendix C—Field Visit Worksheets
Appendix D—Annual Report Review and Evaluation Worksheet

Note that this Guidance is best used as a preparatory tool and except for the worksheets in Appendices B and C does not lend itself well as a reference to be used *during* an evaluation.

1.2 Regulatory Overview

For More Information:
For information on stormwater programs and regulations visit www.epa.gov/npdes/stormwater

Background

A brief summary of EPA's stormwater regulations are presented below. Sections of relevant regulatory text are included in the Chapter 4 of this Guidance, however, MS4 stormwater program evaluators are referred to the NPDES Phase I and Phase II regulations, preamble, and other EPA guidance for detailed information on the stormwater regulations. State programs that wish to adopt this Guidance may want to add state-specific elements.

In 1987, Congress amended the **Clean Water Act** (CWA) to require implementation, in two phases, of a comprehensive national program for addressing stormwater discharges.

Stormwater Phase I

The first phase of the program, commonly referred to as "Phase I," was promulgated on November 16, 1990 (55 *Federal Regulations* (FR) 47990) and addresses MS4, active construction and industrial facilities.

Phase I requires NPDES permits for stormwater discharges from a large number of priority sources including medium and large MS4s generally serving populations of 100,000 or more, and several categories of industrial activity, including construction activity that disturbs five or more acres of land.

The Phase I permits mostly covered larger cities, and required them to develop a SWMP, conduct some monitoring, and submit periodic reports.

According to 40 CFR 122.26(b)(8), **municipal separate storm sewer system** means a "conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law)...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States. (ii) Designed or used for collecting or conveying stormwater; (iii) Which is not a combined sewer; and (iv) Which is not part of a **Publicly Owned Treatment Works** (POTW) as defined at 40 CFR 122.2."

TIP:
MS4 systems can be linear or more complex, open, piped, manmade, natural, or a combination of all of these things. Some carry groundwater or piped streams, are tidally influenced, or have some other constant source of non-stormwater discharge.

What constitutes an MS4 is often misinterpreted and misunderstood. An MS4 is not always just a system of underground pipes—it can include roads with drainage systems, gutters, and ditches. Although most entities with MS4s are local municipal governments (e.g., cities and counties), there are other governmental entities that manage storm drain systems at their facility, including state departments of transportation, universities, local sewer districts, hospitals, military installations, and prisons. As

previously stated in the "Common Terms" section, the term "MS4" can refer to the system itself or the entities which own and operate the system.

The operators of construction activities disturbing greater than 5 acres have been required to obtain NPDES permit coverage since 1992. General permits for large construction activity require construction operators to develop and implement a stormwater pollution prevention plan to control erosion, sediment and other wastes on the site.

The Phase I industrial stormwater program regulates eleven industrial categories, which EPA has further broken out into 30 sectors. Similar to construction activities, these industrial facilities have been required to obtain NPDES permit coverage since 1992. General permits require regulated industries to develop and implement a stormwater pollution prevention plan, including monitoring for some industries.

Stormwater Phase II

The second phase of the stormwater program, promulgated on December 8, 1999 (64 FR 68722) and amends existing Phase I regulations dealing with MS4s, active construction and industrial facilities.

Phase II Stormwater Minimum Measures

- ✓ Public education and outreach
- ✓ Public involvement/ participation
- ✓ Illicit discharge detection and elimination
- ✓ Construction site runoff control
- ✓ Post-construction stormwater management
- ✓ Pollution prevention/ good housekeeping for municipal operations

The Phase II regulations require NPDES permits for stormwater discharges from certain small municipal separate storm sewer systems and construction activity generally disturbing between 1 and 5 acres. The construction requirements essentially extended the Phase I threshold for construction activities from 5 acres down to 1 acre.

Under the Phase II MS4 stormwater program, operators of regulated small MS4s are required to

- Apply for NPDES permit coverage
- Develop a SWMP that addresses six minimum control measures
  - Public Education and Outreach on Stormwater Impacts
  - Public Involvement/Participation
  - Illicit Discharge Detection and Elimination
  - Construction Site Runoff Control
  - Post-Construction Stormwater Management in New Development and Redevelopment
  - Pollution Prevention/Good Housekeeping for Municipal Operations
- Implement the SWMP using appropriate stormwater management controls, or BMPs
- Develop measurable goals for the SWMP
- Evaluate the effectiveness of the SWMP
- Provide reports on program status

The Phase II regulations also required certain regulated industrial facilities, with no industrial activities exposed to stormwater runoff, to submit a certification of "no exposure" if the facility fell into one of the regulated eleven industrial categories but did not have an NPDES permit.

MS4 Permits

Phase I MS4 permittees were subject to the permit application requirements found at 40 *Code of Federal Regulations* (CFR) 122.26(d). The permit application consisted of two parts that provided the NPDES permitting authority comprehensive information to use in developing permit requirements. Information required in the application included a physical description of the MS4, legal authority of the MS4 operator, a characterization of the surrounding sources and the pollutants found in the stormwater discharge, and a description of fiscal resources. The most significant portion of the application was the development of a proposed SWMP that would meet the standard of "reducing pollutants to the MEP." Using the information submitted in the permit application, the NPDES permitting authority would then develop appropriate permit requirements. Phase I MS4 permittees were covered under individual permits issued to either single permittees or groups of co-permittees.

Although there are some exceptions, phase II MS4 permittees are primarily covered by general permits that require implementation of the six minimum control measures.

The specific requirements in MS4 permits vary greatly around the country. Some MS4 permits contain broad requirements that outline the basic SWMP components the permittee is required to implement, giving the permittee the flexibility to develop a program to meet these broad requirements. Other MS4 permits are more prescriptive and specify in detail the minimum activities and BMPs for each program element.

1.3 Types of Permittees

Traditional MS4 Programs

Many MS4 operators permitted under the NPDES program are either city or county governments. To evaluate this type of an MS4 program, an evaluator must have a basic understanding of the structure, operation and function of local governments. The structure and authority of local governments can vary by state (for example, the use of towns, townships, villages or parishes), therefore a general description of a common city/county local government structure is provided below.

TIP:

City and county stormwater management programs can be administered by various programs including: public works, building, and environmental program, or wastewater management staff, usually pretreatment.

Cities provide a variety of functions including fire and police protection, construction and maintenance of streets, stormwater and wastewater services, and providing for health, recreation, and social needs. Counties provide many of these same services in unincorporated areas. Cities are governed by a city council that establishes municipal policy and enacts local ordinances. Many cities are run by the council-manager system, where the elected council appoints a full-time professional manager to direct city departments and implement policy. Some cities are run by the mayor-council system, where a mayor (either elected or appointed by the council) works with the council to direct city departments and implement policy.

City boundaries can change through the annexation process. Unincorporated county land that is adjacent to the city can be annexed through a formal process.

Stormwater management responsibilities vary depending on the city or county. Some permittees assign stormwater program oversight and implementation to the public works department, while others assign stormwater to an environmental services department. Still others combine stormwater program implementation with wastewater treatment agencies, flood control authorities, or other regional entities. Also, some counties perform stormwater activities within incorporated cities (such as inspections). Each

permittee should clearly describe in the SWMP Plan the roles and responsibilities of each department involved in stormwater management.

Nontraditional MS4 Programs

As stated previously, the term MS4 does not solely refer to municipally owned storm sewer systems. Examples include, but are not limited to non-traditional entities such as state departments of transportation (DOTs), airports, universities, local sewer districts, hospitals, military installations, post offices, prisons, or irrigation districts.

For More Information:

The California Department of Transportation is a non-traditional MS4. To review the permit, programs, reporting, etc. visit: http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm

Because of the unique structure and features of many non-traditional MS4s, some of the traditional SWMP elements may need to be modified or may not be entirely applicable. For example, a public education program for a state DOT or military base would be very different from a public education program for a traditional city.

TIP:

When evaluating non-traditional MS4 SWMPs, be sure to adjust interview topics and questions, field inspections, and documents evaluated to accommodate any unique characteristics of the MS4.

In other instances, some non-traditional MS4s may lack the legal authority or employ a different type of enforcement mechanism than a city/county government to implement a SWMP component. For example, a state DOT may not have the legal authority to enforce controls on illicit discharges into its system. In these situations the DOT is encouraged to work with the neighboring regulated permittees to develop and implement a shared SWMP in which each permittee is responsible for activities that are within their individual legal authorities and abilities. The DOT could work closely with the permittees that surround the DOT MS4 (i.e. country or city) and use their enforcement authority to eliminate illicit discharges. In other words, a municipal permittee can utilize regulations which prohibit polluted runoff from leaving an individual property and entering the DOT MS4 if the property is covered under an appropriate municipal code (e.g. building, health, etc.) An evaluation of a non-traditional MS4 program must be very specific to the particular circumstances, permittee relationships, and permit requirements applicable.

2. Pre-Evaluation Preparation

2.1 Evaluation Goals and Benefits

Evaluation Goals

A permitting authority can have one or more overall goals when conducting an MS4 program evaluation. Identifying the overall goals of the evaluation will help in developing an appropriate schedule and focus. The primary goals in conducting an MS4 SWMP evaluation can include

TIP:

An MS4 evaluation should not be confrontational. The evaluation process works smoothly if both parties use the evaluation as a mechanism to improve the program and increase coordination.

- **Determination of compliance status.** Assessing the compliance status of a permittee with its MS4 permit and SWMP Plan is often a principal goal of an evaluation.
- **Assistance with permit issuance or renewal process.** An on-site program evaluation might be very helpful after the issuance or during renewal of a permit. The evaluation process can be used to identify and answer questions about implementation of program components within the first year of permit issuance. Towards the end of the permit term, the permitting authority can use the evaluation to assist the permittee with the permit application or SWMP Plan revision and/or the evaluation may provide valuable information to the MS4 permit writer to assist in the permit renewal process (including the drafting of a new Phase II General Permit).
- **Phase II SWMP development.** Because most Phase II permittees are just beginning to implement SWMPs, a full compliance evaluation might not be necessary. Nevertheless, an evaluation can also be a compliance assistance tool that can help to correct deficiencies early in the program. Permitting authorities could conduct evaluations geared toward compliance assistance early in the Phase II program development process.
- **Assessing pollutants of concern.** If a water body is impaired or there is a concern regarding pollutants common in urban stormwater, it may be helpful to assess the implementation effectiveness of MS4 programs in the watershed to reduce those pollutants. If a **total maximum daily load** (TMDL) has been developed for a waterway receiving a discharge from a permittee, a program evaluation may assist the permitting authority in assigning an applicable **wasteload allocation**, and/or assist the permittee in implementing the steps necessary to comply with the wasteload allocation.
- **Technical assistance**. Providing technical assistance is an important goal of an MS4 SWMP evaluation. Often it is the only time that the permitting authority staff and the permittees meet face-to-face and can be a valuable opportunity to share technical expertise, advice, reference materials, and examples of successful SWMPs implemented elsewhere.

Benefits of an Evaluation

There are a number of benefits from conducting an MS4 SWMP evaluation of a permittee, including:

- Determination of compliance and assistance with execution of appropriate enforcement actions
- Stronger coordination and working relationship between the permitting authority and the permittee
- Better understanding by the permittee of the expectations and permit requirements of the permitting authority
- An opportunity to clarify any misunderstandings in the MS4 permit requirements or SWMP Plan

- Improved permitting authority knowledge of the permittee's operations, priorities, constraints and challenges faced when implementing a municipal stormwater program
- A more effective SWMP resulting in better water quality

2.2 Advance Preparation

Evaluation Options

Which permittee(s) should be evaluated?
The first question to be answered is which permittee should be evaluated. If the permitting authority has jurisdiction over numerous MS4 permits, ideally all MS4s would be evaluated on an annual basis. If staff resources are limited and only a select number of evaluations can be conducted in a given year, a permitting authority may want to evaluate those MS4s with suspected compliance issues, those located in watersheds of concern, or those with pending permit renewals most frequently. However, permitting authorities should visit each permittee on a regular basis, even if they are not considered "bad actors" however, as evaluations provide many valuable benefits beyond compliance determination or assistance with permit renewal.

If a selected permit covers more than one co-permittee, the evaluator then must determine which co-permittee or co-permittees should be evaluated during a single evaluation. Some permits may cover 20-30 or more co-permittees and it may be impossible to evaluate them all in a single evaluation or year. Evaluations conducted early in the permit cycle may focus on the larger MS4s or those that coordinate activities for smaller permittees. Subsequent evaluations may focus on the smaller co-permittees that have compliance issues or located in watersheds of concern.

After the evaluator has determined which permittees are to be evaluated, the evaluator must consider several questions when determining the level of detail for the evaluation and how best to facilitate and coordinate the process.

What Level of Detail is Possible or Necessary?
If limited time is available, a screening-level evaluation may be an efficient and effective method for developing a basic impression of the program's compliance status or as a way to determine if a more in-depth evaluation is necessary (see Chapter 3). A screening is a way to uncover "red flags" or obvious instances of noncompliance with the MS4 permit. A screening-level evaluation is comprised of a basic interview with the MS4 coordinator or main contact of the program along with a review of the most recent annual report and the SWMP Plan. Documents can be obtained during the screening and reviewed by the evaluator at a later date. The screening-level evaluation should take a minimal amount of time but should be thorough enough to answer general questions about permit compliance. This type of screening may be the precursor to a detailed evaluation (see Chapter 4) at a later date.

A detailed on-site evaluation involves a more intensive review of files and detailed interviews with all or most applicable office and field staff. This type of review is more time-consuming but will provide a more comprehensive picture of SWMP development, coordination, and implementation.

Type of Evaluation	Typical Allotted Time[1]
Screening-level	2-6 hours per permittee
Detailed on-site evaluation	2-3 days per permittee

[1] Assumes one evaluator

Which Program Component(s) will be Evaluated?
A program component-specific evaluation focuses on a specific stormwater program area, such as construction activities or new and significant redevelopment. This type of evaluation may allow the evaluator to get more details through a more extensive file review or more numerous field inspections. For example, during an evaluation focused strictly on the construction component the evaluator may be able to interview all plan reviewers on staff, do an in-depth review of multiple erosion and sediment control plans, review those site's compliance histories, and perform inspections of each. This type of a review is especially helpful if the permitting authority has specific concerns about implementation of a particular component. Such an in-depth evaluation will typically take 1 to 2 days, depending on the complexity of the program and the amount of information to be covered.

Primary Phase I Stormwater Components
- ✓ Program management
- ✓ Maintenance activities
- ✓ Construction
- ✓ Post-construction
- ✓ Illicit discharge detection and elimination
- ✓ Public education/Participation
- ✓ Industrial/Commercial

A detailed on-site evaluation addresses all of the generally accepted primary stormwater program components (i.e., program management, MS4 maintenance activities, construction, post-construction, illicit discharge detection and elimination, public education/participation and industrial/commercial for Phase I MS4 permittees). The intent of a detailed on-site evaluation is to assess the permittee's entire SWMP and possibly identify specific areas or issues that might require a component-specific review in the future.

The level of detail that can be achieved during either type of evaluation is often dictated by the amount of time devoted to each program area. Both the screening-level and detailed on-site evaluation can vary in terms of level of detail.

Will the Evaluation be Conducted in the Office, the Field, or Both?
To get an accurate picture of "on the ground" implementation of the construction and industrial/commercial components of a typical SWMP, the evaluator will need to accompany inspection staff into the field. In addition, many permittees manage municipal facilities such as maintenance yards, material storage facilities, or other municipal facilities that would be helpful to visit during the evaluation to ascertain the permittee's municipal housekeeping practices. If time allows and the evaluator has questions about implementation of these aspects of the SWMP, field time should be built into the evaluation schedule.

As previously stated, this level of detail may not be necessary for a compliance screening or component-specific inspection. In addition, if the program areas being evaluated do not have a field element (i.e., public education), then field activities will not be necessary.

Evaluation Logistics

The MS4 program coordinator or primary contact should be notified well in advance to allow for proper coordination and scheduling amongst parties responsible for program implementation. The contact should be in charge of determining who the appropriate people are to include in the evaluation. Some examples of pertinent staff includes:

TIP:
It is helpful to exchange cell phone numbers to facilitate schedule changes, alternative meeting places, inspection schedules, etc.

- Program managers
- Inspectors

- Administrative staff
- Outreach specialists
- Legal staff

One or more conference calls prior to the evaluation may be necessary to establish the schedule, determine appropriate participants, and answer any questions. Establishing email contact with all of the players well in advance is key to providing necessary information, resources, as well. A final call is helpful the week before the evaluation to answer any last-minute questions, exchange contact information (especially cell phone numbers), confirm the schedule and meeting locations, and make necessary changes. A final evaluation schedule should be developed and distributed to all contacts well in advance to ensure everyone is prepared and expecting the evaluator(s) on the correct dates.

When conducting a component-specific inspection, depending on the complexity of the program, roughly 2 – 4 hours should be assumed for an adequate in-depth office review of each program component. Evaluation of inspection activities in the field can be time consuming due to travel times between sites and facilities, so it is important to allow adequate time in the field as well. Normally, four hours per component (e.g., construction, industrial/commercial) is adequate to evaluate inspection staff. Evaluation of municipal maintenance activities should include adequate field time to inspect the municipal public works yard or similar facility, but normally this should not take more than 1 – 2 hours. All of these time estimates should be confirmed with the permittee when establishing the draft schedule.

Depending upon the size of the area covered under the MS4 permit, the scope of the SWMP, and the type of evaluation to be conducted, a single evaluator could require three days for a comprehensive, in-depth office and in-field program audit.

More than one evaluator can be used to conduct a comprehensive audit as well. This allows one person to interview office staff and another to perform field activities thereby minimizing the number of days to complete the audit.

In addition, multiple evaluators can be used to assess multiple permittees covered under one permit simultaneously. This can be accomplished either by assigning evaluators or "teams" to a particular permittee or to a specific component for all permittees. For example, Team 1 would assess all construction programs for three separate permittees covered under the same permit during a three day period. This approach allows for a consistent review of the all three permittees' construction programs and helps to ensure an equitable assessment between them. Or, Team 1 could review all program components for the City of Pleasantville, while another evaluator reviews the Town of Bliss. This allows the evaluators to become intimately familiar with all facets of their respective MS4 permittees, SMWP, implementation challenges, etc.

It is helpful to try and minimize travel between office locations whenever possible and establish a central meeting place, such as a conference room in a city hall, to save time.

Often it is helpful for the evaluator to coordinate a "kickoff" meeting at the start of the evaluation to review the schedule, answer any last minute questions and finalize logistics. An outbrief session is helpful to coordinate at the conclusion the audit to give a tentative summary of findings from the evaluation. Care must be taken to caveat all

TIP:

Outbrief sessions should be limited to the findings the evaluator feels comfortable revealing prior to a more thorough review of documents, interview responses, and inspection results. In addition, it should be stated that the outbrief findings are subject to change. Rebuttals and questions by the MS4 staff should be limited to clarification of incorrect findings or misunderstandings.

findings as preliminary at that time subject to change based on further review of evaluation materials, the permit, or the SWMP Plan.

Below is an example of a comprehensive, 3-day MS4 program evaluation schedule that addresses the major SWMP components for typical Phase I and Phase II permittees.

Example Schedule for a Phase I Permittee

Monday

8:30 – 9:00	Evaluation Kickoff
9:00 – 12:00	Illicit Discharge Detection and Elimination & Industrial and Commercial Facilities (office)
1:30 – 5:00	Industrial and Commercial Facilities (field)

Tuesday

8:30 – 12:00	MS4 Maintenance Activities (office and field)
1:00 – 5:00	New Development/Redevelopment & Construction Activities (office)

Wednesday

8:30 – 12:00	Construction Inspections (field)
1:30 – 3:00	Outbrief Session

Example Schedule for a Phase II Permittee

Monday

8:30 – 9:00	Kick-off Meeting
9:00 – 10:30	Program Management, Effectiveness and Assessment
10:30 – 12:00	Public Education and Outreach Public Involvement/Participation
1:00 – 5:00	Post-Construction Stormwater Management Construction Activities (office)

Tuesday

8:30 – 12:00	Pollution Prevention/Good Housekeeping for Municipal Operations (office and field)
1:00 – 4:00	Construction Site Runoff Control (field)

Wednesday

8:30 – 10-30	Illicit Discharge Detection and Elimination
10:30 – 12:00	Outbrief Session

2.3 Materials to Review Before the Evaluation

The information provided below should be reviewed before an on-site evaluation. The level of review varies depending on the evaluator's experience with the particular permittee program being evaluated and the type of evaluation being conducted.

- **MS4 NPDES permit.** Because the evaluation is ultimately an assessment of the permittee's compliance with its NPDES permit, the evaluator must be very familiar with the permit and its requirements.
- **SWMP Plan.** The evaluator must review the permittee's latest SWMP planning document(s) and note the commitments and schedules for specific activities.
- **Latest annual report.** The most recent annual report must be reviewed to establish the current status of implementation. Previous annual reports could be reviewed if time permits and if the evaluator wants to assess trends before the on-site evaluation. See Chapter 2.4 below for guidance on Annual Report review.
- **Permitting authority correspondence with the permittee.** Review any relevant correspondence with the permittee regarding its stormwater program. This material might include permitting authority comments on the permittee's SWMP Plan, comments on annual reports, notices of violation (NOVs), or other notices.
- **Permitting authority inspections within the MS4.** Ideally, the evaluator should be aware if an NPDES permitting authority industrial or construction inspector has found violations within the permittee's jurisdiction. If this review is not completed before an evaluation is conducted, it should occur after the on-site evaluation and before the final evaluation report is developed. Any findings should be incorporated into the final report.
- **Permittee Web sites.** Often, permittees have developed stormwater Web sites that can provide copies of reports, guidance documents, and other more current information on the stormwater program.
- **Legal authority.** Review the permittee's legal authority, especially with respect to any exemptions or exclusions from the applicable ordinance.
- **Special water quality concerns.** Be aware of any impaired waters, TMDLs, high quality or protected status, or other water quality-related designations for water bodies to which the MS4 discharges.
- **Other water programs affecting the permittee.** A significant source of frustration to permittees is trying to meet requirements for multiple programs arising from a single agency (i.e. EPA or state environmental protection agency) when program staff within that agency do not understand the trade-offs (sometimes even contradictions) in funding and implementing the requirements of various regulations and programs. For example, an MS4 SWMP evaluator should at least be aware if the municipality being evaluated has a drinking water program, a state revolving fund loan, wastewater permit(s), **combined sewer overflow** (CSO) long-term control plan, or other requirement for which it must also account to the permitting authority. If there is time, it is helpful to find out a little bit about the program requirements applicable to the municipality. There may even be ways to streamline, modify or combine certain requirements to meet multiple program goals.

For More Information:

Chittendon County, Vermont, has developed a Web site to educate the general public about stormwater and the regional management program. Visit http://www.smartwaterways.org

Resources

✓ TMDLs http://www.epa.gov/owow/tmdl/

Resources

✓ Combined Sewer Overflows www.epa.gov/npdes/cso

✓ State Revolving Fund www.epa.gov/owm/cwfinance/cwsrf/index.htm

2.4 Annual Report Reviews

Applicable federal regulations for the NPDES stormwater Phase I regulations and Phase II Rule require that annual reports be submitted. Many permitting authorities include more specific requirements for reporting in their MS4 permits. These reporting requirements can include specific information required for each program component, or it can specify the format for the annual report. For permits with multiple co-permittees, often a central organization or lead co-permittee will coordinate the annual report and submit one to cover all co-permittees.

In general, an annual report should document implementation of the SWMP during the previous year; evaluate program results and describe planned changes towards continuous improvement. Generally written for the permitting authority, an annual report can also be written for the citizens of the community as a way to report progress in meeting water quality goals. To this end, an annual report should clearly illustrate three key items for each SWMP area:

- **Permit and SWMP Requirements.** These requirements either will be specifically prescribed in the permit itself, or described in the permittee's SWMP. The SWMP normally is considered a binding document and part of the permit once it is submitted and approved by the permitting authority. A description of applicable goals or performance standards for each SWMP component should be stated in this summary as well.

- **Summary of Year's Activities.** The summary should describe and quantify program activities for each SWMP component. Responsible persons, agency, department or copermittee should be included. Each activity should be described in relation to achievement of established goals or performance standards.

- **Planned Activities and Changes.** The annual report should describe activities planned for the next year highlighting any changes made to improve BMP or program effectiveness.

An annual report should describe not only the activities during the previous year, but should highlight the SMWP's effectiveness as well. It should be assumed that the ultimate goal of the SWMP is the protection or improvement of water quality; however, there may be multiple, smaller program goals. Identification of direct measures of success for a stormwater program is very difficult, therefore, what is considered 'effective' and how the permittee chooses to assess this effectiveness will vary. Ideally the permittee and permitting authority will establish performance standards or goals in an attempt to define and quantify what is "effective" when the permit is issued. If the performance standards or goals include definitive milestones or schedules, the annual report should highlight these as well.

In addition to the items described above, the annual report should include appropriate program budget information, and a summary of any required monitoring data.

It is important to remember that annual reporting and program assessment are valuable exercises for the permittee as well as the permitting authority. Reporting should not be seen as merely a 'bean counting' effort. The permittee benefits greatly as an annual program assessment guides program focus, helps to budget and target resources, helps justify program support, and facilitates participation among the affected departments and permittees.

Step 1: Related Document Review and Preparation

Prior to beginning the annual report review, an evaluator should review or obtain the following information:

- **NPDES permit provisions.** The NPDES permit requirements will serve as the primary basis for the annual report review. The permit should describe basic program requirements, discharge prohibitions and reporting requirements.

- **SWMP provisions.** The permittee's SWMP document will describe the overall management structure of the program, planned activities, milestones, schedules and any established performance standards or goals. The SWMP should describe if there is a blanket organization which coordinates the co-permittees and if the organization is coordinated by co-permittee staff or a consultant.

- **Previous annual report review comments.** If the previous year's annual report was received and reviewed by the permitting authority, any comments or response should be reviewed to determine if requested changes to report were made, requested information was provided, etc.

- **Previous annual reports.** It is helpful to have access to previous years' reports as certain documents may have been submitted which may be helpful to have on hand (i.e., an ordinance which established legal authority).

Step 2: Background Information

It is helpful to first document basic information about the permittee and permit. Each permittee has different land use, socioeconomic, and water quality issues which will shape the SWMP. All of this information may not be included in the annual report, but can be obtained through a cursory internet search.

- What is the population served by the permittee?
- What is the primary industry within the permittee's boundary?
- What are the primary land uses within the permittee's boundary?
- What are the priority pollutants within the watersheds of the permittee's boundary?
- Are there impaired waterways impacted by the permittee?
- Have TMDLs been established?
- Are there other sensitive areas of concern within the permittee's boundary?

Step 3: Legal Authority

While most important during the first permit year annual report review, it is helpful to confirm a permittee's legal authority to implement all components of the SWMP on an annual basis. Note any described changes to the SMWP and confirm that existing legal authority will support the implementation of those changes (i.e., requiring existing gas stations to install catch basin insert treatment BMPs). Any changes to applicable ordinances should be included in the annual report as well. If the actual codes or ordinances are not included in the annual report or previous annual reports, they should be obtained during an on-site evaluation.

Step 4: Fiscal Analysis

Phase I regulations require that annual expenditures and budget for the year following be included in each annual report. No such requirement exists for Phase II. If included, this information should be reviewed to determine if budget changes are being made. If funding changes are planned, an explanation should be provided (i.e., an additional inspector is being added or additional expenditures are not expected for the development of new outreach materials as they were developed during year one of the permit).

Step 5: SWMP Component Review

TIP:

When reviewing an annual report with the Worksheet provided, pay special attention to questions in the Worksheet answered "unknown." Program components for which little information was provided may be good candidates for an on-site evaluation.

While each MS4 SWMP will differ based on various factors (i.e., permit requirements, priority pollutants), the Worksheet lists some basic information that should be provided for each program component. In addition, each target established in the permit or SWMP should be documented and verified on the Worksheet as well. It is helpful to document all quantifiable data during the review to highlight what vital information may be missing and what, if any "red flags" need to be addressed with the permittee. For example, if the permittee provides the total number of construction inspections conducted, but does not provide the prioritized list of active construction sites, the reviewer cannot determine the frequency of inspections or whether high-priority sites were adequately monitored and assessed. Further if the permittee had established a goal of inspecting all active sites within 48 hours of every rain event, the reviewer would be unable to ascertain whether this goal had been met.

For each program component, the annual report should describe applicable training of staff which occurred during the previous year. It is helpful if agendas or presentation materials are included.

As described in the Conducting an Evaluation section of this Guidance, information regarding the implementation of the following SWMP components should be provided in a Phase I MS4 annual report (additional components may be required by the MS4 permitting authority):

- Program to detect and eliminate illicit discharges to the system
- Program to prevent, contain, and respond to spills
- Program to educate and allow citizens to report illicit discharges or other potential impacts to water quality
- Educational program to encourage the proper disposal of used oil and other toxic materials
- Program to reduce infiltration of sewage into the storm sewer system
- Program to reduce pollutants from active construction sites
- Programs to reduce pollutants in runoff from industrial, commercial, and residential areas

Phase II permittees are required to develop SWMPs which include similar minimum measures, each of which should be addressed in an annual report:

- Public education and outreach program
- Public involvement/participation program
- Illicit discharge detection and elimination program
- Construction site stormwater runoff control program
- Post-construction SWMP for new development and redevelopment (for development greater than or equal to one acre)
- Pollution prevention/good housekeeping program for municipal operations

For purposes of this Guidance and annual report review Worksheet, the above SWMP requirements have been combined and categorized into the following components for both Phase I and Phase II MS4s:

- Program Management
- Public Education and Public Participation
- Municipal Maintenance/Good Housekeeping
- Construction Activities
- New Development and Significant Redevelopment
- Industrial/Commercial Facilities
- Illicit Discharge Detection and Elimination

Step 6: Follow-Up Activities

The information obtained during the annual report review can be used in various ways.

1. To provide feedback to the permittee regarding program development or implementation. Often, permittees have limited contact with permitting authority staff and the submittal of an annual report is the primary means of communication during the year. It is important that the permitting authority review annual reports in a timely manner and respond with any comments, suggestions or criticisms.

2. To determine the need for an on-site evaluation. If the annual report elicited numerous questions about SWMP implementation, an on-site evaluation may be very helpful in determining compliance or effectiveness of the MS4 program.

3. To prepare for an on-site program evaluation. If a permittee has been selected for an on-site evaluation, the most recent and historic annual reports should be reviewed prior.

4. To determine the compliance status of the permittee and progress towards achieving permit requirements, milestones or measurable goals. The permitting authority may choose to use the annual report to determine compliance and issue necessary enforcement actions.

5. To note exceptional approaches, programs, or BMPs used by the permittee that might be helpful to other permittees. Often it is beneficial for permittees to share information, program ideas, educational tools or implementation approaches and annual reports are a good way to facilitate the distribution of ideas.

3. Conducting a Screening-Level Evaluation

3.1 Screening-Level Procedures

TIP:

Conduct a screening-level evaluation when you have limited time and want a "quick" assessment of the MS4.

The majority of this Guidance (Chapter 4 and the worksheets in Appendix B) describes how to conduct a detailed on-site evaluation of an MS4 program. However, if an evaluator does not have enough time to conduct a detailed on-site evaluation, a more limited screening-level evaluation could be conducted. The intent of the screening-level evaluation is to quickly identify the program areas that are deficient or noncompliance and should be targeted for a more in-depth evaluation. The screening-level evaluation is not intended to be an assessment of compliance with all permit conditions.

TIP:

Benefits of a screening-level evaluation:

- A quick "snapshot" of MS4 compliance
- Identify major strengths and weaknesses of a program
- Can be conducted in a relatively short amount of time

The screening-level evaluation ideally should be conducted on-site at the permittee's offices after a review of the permittee's annual report (see chapter 2.4). The screening-level evaluation could cover all program components or focus on specific program components that are of particular interest due to pollutants of concern, past compliance issues, or other factors. Depending on the level of detail, the complexity of the program and the number of program components to be reviewed, the screening-level evaluation could last from 2 hours to a full day.

To conduct a screening-level evaluation, the evaluator should be familiar with the permittee's NPDES permit and most recent annual report. The screening-level evaluation will need to be customized to the unique permit requirements and issues of each MS4, however, some of the more common questions and information to review during a screening-level evaluation are listed below. An evaluator should use this list as a guide to help them quickly assess whether a more comprehensive evaluation is necessary for a certain program component or to review the entire SWMP.

3.2 Common Screening-Level Questions

Program Management

Key questions to ask:

- ✓ Does your written stormwater management plan include specific milestones and quantities for each program/BMP?
- ✓ Describe how your SWMP is coordinated across departments.
- ✓ Describe the impaired waters, pollutants of concern and TMDLs for the waterbodies you discharge to. Does your SWMP include programs or BMPs specifically addressing these impairments?
- ✓ Describe how you evaluate the success of your stormwater management program.

Potential information to review:

- ✓ Stormwater management plan document
- ✓ Most recent annual report
- ✓ Organizational chart showing departments with stormwater responsibilities

Public Education and Participation

Key questions to ask:

- ✓ Describe your overall approach to educating the public on stormwater issues.
- ✓ What are the primary pollutants or behaviors you target with your public education program?
- ✓ Describe your top three target audiences and the messages you plan to deliver. How do they relate to the primary pollutants or behaviors?
- ✓ How do you evaluate the effectiveness of your outreach activities? Have you conducted any public awareness surveys?

Potential information to review:

- ✓ Public outreach strategy
- ✓ Results of any public awareness surveys
- ✓ Information tracking the distribution of outreach materials

MS4 Maintenance Activities

Key questions to ask:

- ✓ Describe your current MS4 mapping resources (e.g., has the permittee mapped storm drains, outfalls, inlets, municipal facilities, etc.).
- ✓ Describe your procedures for catch basin cleaning, street sweeping and MS4 maintenance.
- ✓ Do your municipal facilities have SWPPPs? If not, why?
- ✓ How are maintenance staff trained with respect to stormwater activities and BMPs?

Potential information to review:

- ✓ Catch basin cleaning records for the month of _____
- ✓ Stormwater plan or SWPPP for main municipal maintenance facility (including any self-inspection records)
- ✓ Standard Operating Procedures (SOPs) for stormwater-related maintenance activities

Construction Activities

Key questions to ask:

- ✓ Describe your legal authority to require erosion and sediment control BMPs and enforce stormwater requirements.
- ✓ Describe your system for tracking construction plans, active construction projects, inspections, and enforcement actions (including the number of projects disturbing greater than one acre last year).
- ✓ How do you coordinate implementation of your local erosion and sediment control requirements with the States (or EPA's) NPDES construction general permit requirements?
- ✓ Describe your process for reviewing plans to ensure stormwater BMPs are addressed. What BMPs does a plan reviewer look for on a plan?

- ✓ Interview an inspector to assess how stormwater inspections are conducted at construction sites. Ask about the frequency of inspections and the number of inspectors.
- ✓ Describe the most recent training attended by inspectors and plan review staff

Potential information to review:

- ✓ List of active construction projects disturbing greater than one acre for the month of _____
- ✓ Erosion and sediment control plan reviewed and approved by permittee (selected from list)
- ✓ Inspection reports for a selected project (including any enforcement actions for noncompliance)

Post-Construction Controls

Key questions to ask:

- ✓ Describe your post-construction design standards and legal authority.
- ✓ Describe your process for reviewing plans to ensure post-construction BMPs are addressed. Do plan reviewers use checklists to ensure consistent plan review?
- ✓ Describe your post-construction operation and maintenance (O&M) program (including your inventory of post-construction BMPs and your inspection and maintenance schedule).

Potential information to review:

- ✓ Post-construction plan reviewed and approved by MS4
- ✓ Records for post-construction BMP inspection and maintenance; both private and public if applicable
- ✓ An O&M plan for post-construction BMPs from a recently approved project

Industrial/Commercial Facilities

Key questions to ask:

- ✓ Describe your industrial/commercial facility program, including the types and numbers of facilities covered. How were these facilities selected?
- ✓ Describe the types of BMPs or stormwater requirements these facilities must meet.
- ✓ Describe your industrial/commercial inspection program (including the frequency of inspections and the number of inspectors)
- ✓ Interview an inspector to assess how industrial/commercial stormwater inspections are conducted. Ask about the frequency of inspections and the number of inspectors.

Potential information to review:

- ✓ List of industrial/commercial facilities subject to stormwater requirements
- ✓ Inspection report(s) for selected facilities
- ✓ Enforcement records for a facility out of compliance

Illicit Discharge Detection and Elimination

Key questions to ask:

- ✓ Describe your legal authority to prohibit illicit discharges and illegal dumping to the MS4 (including an exemptions).

- ✓ Describe any field screening activities. If an illicit discharge is discovered during screening, what is the process for determining the source and eliminating the discharge.
- ✓ Describe your illicit discharge investigation and spill response programs, including staff and equipment available.
- ✓ How are the locations of illicit discharges tracked and used to steer other SWMP components (i.e. industrial inspections, public education, etc).

Potential information to review:

- ✓ List of illicit discharge events investigated over the past _____
- ✓ Records on investigation, follow-up and enforcement relating to one or more event(s)

3.3 Screening-Level Evaluation Follow-Up

After a screening-level evaluation, an evaluator has several options:

- Submit a report to the permittee summarizing the findings and asking for deficiencies to be corrected
- Conduct a detailed on-site evaluation of those program components found deficient
- Conduct a detailed on-site evaluation of all program components

If an evaluator conducted a screening-level assessment of multiple permittees, common deficiencies can be used to target either more detailed evaluations or additional compliance assistance on those program components. Additional information on post-evaluation activities, including preparing a written report and follow-up activities, are described in Chapter 5.

4. Conducting a Detailed On-Site Evaluation

The following chapter describes the process and content of a detailed on-site evaluation. The following program areas are covered:

- Program Management
- Public Education and Participation
- MS4 Maintenance Activities
- Construction Activities
- Post-Construction Controls
- Industrial/Commercial Facilities
- Illicit Discharge Detection and Elimination

Each program area section includes a list of regulatory requirements that apply to that program area and describes activities that typically are performed by permittees to meet permit requirements. The sections also include a description of documents to be reviewed before the evaluation and a series of questions to be asked during the interviews. Also included is a list of common problems identified during evaluations.

Approach and Demeanor

An evaluator's approach and demeanor can have a significant impact on the success of the interviews by putting the interviewees at ease. Evaluations can be a stressful process for the permittee, which could result in stilted discussions and overly brief answers to questions. It is best to use a friendly approach and start by asking open-ended, broad questions that allow the interviewees to talk freely about their programs. Since MS4 stormwater programs are not "one size fits all," it is sometimes best to have the interviewees describe their approach to each program area up front rather than ask questions from a list that may not be organized in a way that makes sense in the context of their program's activities. To ensure that all topics are covered in sufficient depth, the evaluator should ask for clarification throughout and take a break at the end of the session to review the list of topics and ask follow-up questions if needed. Maintaining a conversational style will allow the interviewees to explain their answers and feel as though they can provide input into the interview process.

Kick-off Meeting

The first day of an evaluation should begin with a kickoff meeting to allow for introductions and an overview of the process and goals of the evaluation. The meeting usually includes all staff who will be interviewed, and it is a good time for higher-level managers and officials to be introduced to the process and understand what will be happening over the next few days.

The following is a sample agenda for the kickoff meeting. The evaluator should tailor the agenda to suit his or her own objectives:

- **Introductions.** The evaluator should introduce him- or herself and can provide a brief overview of his or her background in stormwater program evaluations. Then each person in the room can introduce him- or herself in turn. It is helpful to distribute a sign-in sheet at this time to collect the names, positions, and contact information for the people being interviewed throughout the week in case follow up is needed.

- **Goals and benefits.** Describe the goals and outline some of the benefits of the evaluation process. These are described in depth in Section 2.1 of this guidance.
- **Schedule.** Review the schedule for the week's interviews and discuss which topics will be discussed during each session. It is also helpful to clarify what type or level of staff should participate in each session and what documentation should be available for review.
- **Products and timeline.** The evaluator should describe the general content and organization of the report and provide a timeline for when a final report will be produced.
- **Questions.** Limit questions to the evaluation process, procedures, and report. Questions about a specific program topic can be addressed during that session.

4.1 Program Management

Regulatory Requirements

Applicable federal regulations for the Phase I and Phase II NPDES regulations are listed at right. NPDES MS4 permits must address these requirements and often more specific state requirements as well.

Common Activities

Comprehensive Stormwater Management Planning

Phase I and Phase II permittees are required to develop SWMPs designed to reduce the discharge of pollutants from the MS4 to the MEP. Ideally, a SWMP is developed with input from internal and external stakeholders including, but not limited to, departments, agencies, and co-permittees within the permitted area, the general public, nonprofit organizations, state agencies, and watershed groups. This program should be described in a planning document (SWMP Plan) that details organizational structure and coordination scheme and a detailed description of the proposed controls or program components (i.e., public education and outreach) that includes performance standards or goals, standards, or timelines and a prioritization of existing resources.

Multiple co-permittees or different agencies may be involved in the development and implementation of the MS4 SWMP programs and Plan. To ensure that the program is implemented consistently by all, it is important that the SWMP describe the communication mechanisms between the co-permittees, and between the co-permittees and other agencies. Within a permittee's stormwater management structure there might be different departments that are to develop, implement, and enforce various components of the program. The SWMP should describe how the various departments communicate and coordinate activities.

Performance standards and goals are important tools for permittees to use to gauge the success of their programs in achieving measurable benefits and improving water quality. The development of performance standards or goals may not be required for many Phase I permittees, however, you should discuss the establishment of water quality-or performance-based goals for SWMP components and refer Phase I permittee's to available measurable goals guidance developed in response to the Phase II regulations (see Resources text box).

Assessment and Evaluation

SWMP evaluations not only demonstrate progress, but also allow the permittee to adjust programming, funding, or staffing levels for the upcoming year to best use existing resources to maximize water quality benefit. Evaluations should examine both direct measures, such as water quality indicators, and indirect measures of program

Federal NPDES Regulations

- ✓ Phase I MS4 Regulations
  40 CFR 122.26(d)(2)(iv)
  40 CFR 122.42(c)
- ✓ Phase II MS4 Regulations
  40 CFR 122.34(a)
  40 CFR 122.34(d)
  40 CFR 122.34(g)(1)
  40 CFR 122.34(g)(3)
  40 CFR 122.35(a)

Resources

- ✓ Menu of BMPs
  www.epa.gov/npdes/stormwater/menuofbmps
- ✓ Measurable Goals Guidance for Phase II Small MS4s
  http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm
- ✓ Stormwater Phase II Fact Sheet Series
  http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm
- ✓ National Management Measures to Control Nonpoint Source Pollution from Urban Areas
  www.epa.gov/owow/nps/urbanmm/index.html
- ✓ Stormwater Phase II Compliance Assistance Guide
  www.epa.gov/npdes/pubs/comguide.pdf
- ✓ Institutional Aspects of Urban Runoff Management
  www.stormwater.ucf.edu/publications/urban_runoff.pdf
- ✓ Stormwater Authority
  www.stormwaterauthority.com
- ✓ Stormwater Manager's Resource Center
  www.stormwatercenter.net

effectiveness, such as improved compliance rates of construction operations resulting from inspections.

Measurable Goals

According to the Stormwater Phase II Regulations, small MS4 operators must reduce pollutants in stormwater to the MEP to protect water quality. The regulations specify that compliance with the MEP requirement can be attained by developing a SWMP that addresses the six minimum control measures previously described in this Guidance. One component required in the Phase II MS4 SWMP is the selection of measurable goals to evaluate the effectiveness of the individual control measures and the SWMP as a whole. Phase I MS4 regulations do not specify the creation of measurable goals per se, but require the assessment of water quality improvements or degradation and propose changes to the SWMP necessary to improve effectiveness. Requiring measurable goals of Phase I permittees allow permitting authorities to track the permittee's progress in implementing BMPs and the overall SWMP. The process for developing measurable goals and the benefits of incorporating them into the evaluation of a MS4 program are the same for Phase I or Phase II permittees.

Resources

- ✓ Measurable Goals Guidance for Phase II Small MS4s. http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm
- ✓ Measurable Parameters http://cfpub.epa.gov/npdes/stormwater/measurablegoals/parameters.cfm
- ✓ California Stormwater Quality Association. An Introduction to Stormwater Program Effectiveness Assessment. http://www.casqa.org/resources/product.php

To determine the effectiveness and success of a stormwater management program, managers must first determine the ultimate outcomes they wish to achieve. Then, programmatic, social, physical, and hydrological, or environmental indicators can be used to assess the achievement of the desired goals, or outcomes.

TIP:

Often, permittees do not develop measurable goals that truly quantify and track progress towards desired outcomes in the SWMP. Many times "performance standards" primarily consist of a list of BMPs. Performance standards should include quantifiable activities that can be tracked or criteria against which progress towards desired outcomes can be measured.

The California Stormwater Quality Association[1] (CASQA) asserts that there are six levels of stormwater management program outcomes. Each successive level represents increasingly difficult outcomes to not only achieve, but to assess.

The levels are:

1. Compliance with activity-based permit requirements
2. Changes in attitudes, knowledge and awareness
3. Behavioral change and BMP implementation
4. Pollutant load reductions
5. Changes in urban runoff and discharge quality
6. Changes in receiving water quality

Stormwater program managers may strive to achieve some or all of these outcomes; however, in general the "implementation outcomes" (1, 2, and 3 above) typically are easier to measure than the more complex goals of reducing loading and achieving changes in discharge and receiving water quality. In addition, these outcome levels are not independent of one another; the hope is that movement towards one will result in progress towards achieving another.

[1] CASQA. 2005. *An Introduction to Stormwater Program Effectiveness Assessment.* August 2005. http://www.casqa.org/resources/product.php

It is important that some measure of assessment be determined in conjunction with the establishment of each goal. A goal can be expressed qualitatively or quantitatively, and the associated index should be measurable, relevant, reliable, available, scientifically valid, replicable, and focused on measuring the outcome.

EPA has developed sets of "measurable parameters" for stormwater program managers to use as a guide when developing quantifiable goals. For example, the following implementation parameters could be used to quantify and track the effectiveness of an illicit discharge detection and elimination program component:

- Inventory conducted and sites prioritized for inspection
- Number of field tests conducted in high-risk areas
- Whether or not an ordinance was developed to allow entrance into private buildings for the purpose of conducting tests
- Number of illicit connections reported by business employees
- Number of survey responses indicating a possible illicit connection
- Number of illicit connections found
- Number of illicit connections repaired/replaced
- Whether or not an ordinance was developed for mandatory inspections of new buildings
- Number of new buildings inspected

CASQA asserts that depending on the outcome, various methods of obtaining necessary measurement data are available, including the following:

Method	Definition	Example
Confirmation	Documenting whether a task has been completed.	Development of an construction operator BMP outreach brochure
Tabulation	Tracking an absolute number or value of something	Number of brochures distributed to construction operators
Surveying	Determining knowledge, awareness, etc. of a group of people	Phone survey of 100 construction operators, 50 of whom had received the BMP brochure, to gauge any differences in stormwater awareness
Quantification	Estimating pollutant loading	Modeling to determine sediment load reductions prior to initiating construction operator outreach program – assumption made about BMP use before and after program
Inspections or site visits	Observing activities or BMPs	Inspections of construction projects before and after initiating construction operator outreach program
Reporting	Utilizing reports generated by third parties	Audit of construction component of the SWMP indicated that BMPs observed and the level of understanding demonstrated by operators had improved during the last year

Method	Definition	Example
Monitoring	Sampling or observation in the field to determine environmental or water quality conditions	Water quality monitoring above and below three comparable active construction sites (Site 1 – trained on construction BMPs, Site 2 – no training, Site 3 – random control, unknown level of BMP understanding) to determine any differences in per/acre disturbed loading of sediment

Permittees need to perform sampling and conduct scientific field assessments to assess specific water quality-related SWMP goals (i.e., pollutant load reductions, changes in urban runoff and discharge quality, and changes in receiving water quality). Some MS4 permits require water quality monitoring to establish baseline water quality conditions, determine the quality of discharges from different land uses or subwatersheds, measure the effectiveness of structural BMPs, or to participate in regional watershed monitoring efforts to track water quality trends.

Evaluating Program Management

Effective program management is essential to help guide SWMP development, implementation, administration, and continued assessment. Each program should have a management process that facilitates stormwater activity coordination between departments within each permittee, between co-permittees, and between the permittee and other organizations and agencies interested in stormwater quality. Some permits that regulate multiple co-permittees may allow for a separate "umbrella" management structure to perform certain functions, one of which may be management of certain components (e.g. public education) of the program and coordination among copermittees. These umbrella structures can be managed by the lead permittee or by consultants hired collectively by all co-permittees.

For More Information:

For an example of a program that uses an "umbrella" management structure, the Contra Costa Clean Water Program manages the stormwater program for nineteen co-permittees in Contra Costa County, California. Visit http://www.cccleanwater.org.

Another important aspect of program management is the development of goals or standards to measure effectiveness of the program from a water quality perspective. This is normally required by the permitting authority in addition to being helpful to MS4 SWMP coordinators for use in budgeting, staff allocation, and long-term planning. When evaluating a SWMP, you should question permittee staff regarding the desired outcomes for the program as a whole and for each individual program component. You should determine what, if any, assessment measures have been established for each goal and question the MS4 staff regarding progress.

The findings of the MS4 evaluation should not be based solely on the level of achievement of measurable goals. It is important, however, that the permittee's SWMP includes the use of measures to assess progress towards meeting goals that benefit water quality and not rely on "bean-counting." You should be confident that the SWMP is being regularly assessed and modified as necessary to improve effectiveness.

Typically, each MS4 SWMP would have a coordinator or other principal contact. This person would be the best to interview regarding program management procedures.

TIP:

Normally, it is not within the scope of a typical MS4 program evaluation to review or evaluate water quality monitoring data. Because of the amount of data, monitoring methods, and monitoring plans, this is an exercise best undertaken by NPDES staff that specializes in ambient water quality monitoring protocols and analysis.

Before the Program Evaluation

To prepare for the program management evaluation, an evaluator should review or obtain the following information prior to the evaluation:

Pre-Evaluation Checklist
- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report
- ✓ Memorandums of understanding

- **MS4 NPDES permit provisions.** Review the permit requirements for program management to identify any specific requirements (such as annual reporting details). The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP planning document(s) should describe the overall management structure of the program.
- **Latest annual report.** The annual report should be reviewed to help you become familiar with the management structure of the program.
- **Memorandums of Understanding (MOUs)** or other written agreements between or among co-permittees or other agencies stipulating arrangements and responsibilities for meeting permit requirements.

Records Review

The following records might help in evaluating the permittee's program management structure. Ask for copies of relevant information where it will help in writing the report or documenting a permit violation.

Documentation	What to Look For
▪ Stormwater program staff lists ▪ Organizational charts ▪ Contact names and responsibilities	▪ Are specific departments and/or individual positions identified as responsible for each part of the SWMP? ▪ Are lines of authority and responsibility clear?
▪ Performance standards ▪ Program goals/measurable goals ▪ Implementation schedule	▪ Has the permittee documented a schedule and goals for guiding the SWMP in subsequent years? ▪ Are these goals specific enough for the SWMP to be evaluated?
MOUs or other agreements	▪ Does the permittee document partnerships with other agencies, nonprofit organizations, or other cooperating entities? ▪ Are the roles and responsibilities of each entity clearly identified?
▪ Tracking systems ▪ Reporting and assessment procedures	▪ Has the permittee established procedures or deadlines for reporting or program assessment, both within the permittee's structure and between agencies or co-permittees?
Coordination meeting schedules, task force rosters	▪ Do permittee staff responsible for implementing the SWMP meet periodically? ▪ Do municipal agency representatives meet to discuss SWMP implementation? ▪ Does the permittee meet with cooperating entities to discuss SWMP implementation?

Elements to Address During the Program Evaluation

A successful management structure will generally be composed of the following elements:

- Comprehensive stormwater management planning
  - Public participation
  - Intergovernmental, agency, and department coordination
  - Staff inventory and organization
  - Performance standards or goals
  - Prioritization of resources
- Data collection and reporting
- Assessment and evaluation
- Program adjustments based on ongoing assessments

The common program elements are the key issues to consider during the review. For each of the elements listed above, this Guidance presents common program activities and questions to consider during the program evaluation. The questions are suggested for you to address each program component. Of course, a comprehensive SWMP evaluation must be tailored to the specific issues associated with each permittee and should include more specific questions regarding the permittee's permit structure and management challenges.

COMPREHENSIVE STORMWATER MANAGEMENT PLANNING

SWMP Planning Documents

- ✓ Has a SWMP Plan been developed? If so, when? Last revised?
- ✓ If a SWMP plan has not been developed, what guidance does the permittee use to implement components of the SWMP?
- ✓ Is there a schedule for revision of the SWMP plan?
- ✓ If multiple co-permittees are included in the program, does each permittee have their own SWMP planning document?
- ✓ Is there an additional MS4-wide document, plan, or program? Who developed it?
- ✓ How were internal and external stakeholders included in the development or revision of the SWMP plan?

Intergovernmental, Agency, and Department Coordination

- ✓ If the permit covers more than one permittee, does the program contain a description of the roles and responsibilities of each permittee and procedures to ensure effective coordination?
- ✓ Is there an "umbrella" group that facilitates administration and coordination among the co-permittees?
  - What functions does this group perform?
  - Are there task forces or committees who are used to coordinate program-wide components and to address specific issues related to different program topics (e.g., Public Education and Outreach Committee)?

- Who are members of these committees?
- Are there regular meetings to coordinate amongst the co-permittees?

- ✓ Is there a formal agreement (e.g., an MOU) between the co-permittees?
- ✓ Discuss with the permittee the institutional arrangements between city departments that have been developed to ensure coordination and collaboration on stormwater management activities.
- ✓ Is there a stormwater committee (or equivalent) within the municipal permittee to help ensure coordination among city departments?
- ✓ How often does the committee meet? Who are the members, and are all the relevant city departments involved?
- ✓ Is the stormwater program coordinated with nonpoint source, **brownfield** redevelopment, transportation planning, underground injection control, coastal zone, household hazardous waste, recycling, and other relevant programs?
- ✓ Does the stormwater program use nonprofit organizations, watershed groups or other community organizations to administer required elements of their permit or minimum measures?

Staff Inventory and Organization

- ✓ Does the permittee have a person designated to lead and coordinate the stormwater program and activities?
- ✓ Does the SWMP planning document include an organization chart listing responsible parties for each SWMP component?

Performance Standards or Goals

- ✓ Has the permittee established measurable goals or performance standards for program components?
- ✓ If performance standards have been established, are they measurable or are they essentially BMP recommendations with level of service (i.e., number of miles swept) requirements?
- ✓ Does the permittee attempt to quantify or assess a program or a BMP's water quality impact or effectiveness as opposed to merely tracking level of service? For example, the percentage of violation recidivism for industrial facilities reinspected during a permit term may provide better information about the effectiveness of the industrial inspection program than the total number of facilities inspected in a year.

Prioritization of Resources

- ✓ Has the permittee identified specific pollutants of concern for its local water bodies?
- ✓ Are these pollutants of concern consistent with priorities identified in the **303(d)-listed** impairments for local water bodies?
- ✓ Are these pollutants of concern consistent with any water quality monitoring data or studies conducted by the permittee or another agency?
- ✓ Has the permittee developed strategies to specifically address those pollutants?
- ✓ How does the permittee decide on program priorities? Are these reassessed periodically?
- ✓ Does the SWMP include a schedule of activities?
- ✓ Does the MS4 discharge to a water body on the state's list of impaired waters?
    - What pollutants are identified on the list?

- Has stormwater been identified as a source?
- Does the SWMP specifically address this pollutant?
- Does the SWMP identify BMPs specifically for sources or discharges to the listed water body?

✓ Has a TMDL been developed for a water body to which the MS4 discharges and for which stormwater has been identified as a pollutant source?

- What pollutants are addressed in the TMDL?
- Does the TMDL specifically address (or include wasteload allocations for) stormwater?
- Has the corrective action plan or other planning to address TMDLs been reviewed for integration with the SWMP?
- Does the permittee's stormwater program address the pollutants of concern identified in the TMDL?

✓ Is the permittee participating in any watershed planning efforts?

✓ Have any goals been developed based on watershed issues, strategies, or challenges?

✓ Has the permittee established a set of indicators or parameters to assess progress toward meeting the goal(s) of the watershed plan?

✓ Is the permittee's stormwater program implemented on a watershed basis?

ASSESSMENT AND EVALUATION

Programs

✓ Does the permittee regularly measure progress against the established performance standards and goals?

✓ Are the goals quantifiable?

✓ Is the permittee analyzing data in the annual report to identify program activities that may need to change to address problem areas?

✓ Has the SWMP been altered based on this evaluation?

BMPs

✓ Is the permittee able to track both structural BMPs and non-structural BMPs and activities?

✓ Has the permittee set measurable goals or performance standards to evaluate individual BMPs and activities or suites of BMPs that address a particular pollutant source?

✓ Is there a process to evaluate or revise individual BMPs and suites of BMPs when receiving water outcomes or endpoints are not being met?

✓ Do assessments evaluate impacts of BMPs on ground water?

✓ Is the permittee analyzing data in the annual report to identify individual BMPs or suites of BMPs that may need to change to address problem areas?

Water Quality

- ✓ Has the permittee documented environmental, water quality, stream corridor, habitat, or other types of improvements?
- ✓ Has the permittee estimated reductions in pollutant loadings from the MS4 or other quantifiable water quality benefits expected as the result of the municipal stormwater program?

MONITORING

Note: It is important to tailor these questions to each permittee's monitoring requirements as specified in their permit.

Wet Weather Outfall Screening and Monitoring

- ✓ Does the permittee conduct wet weather screening at outfalls to characterize stormwater flows from the MS4?
- ✓ Does the permittee have written screening procedures?
- ✓ What is the permittee's schedule for screening the sites?
- ✓ Are parts of the permit area prioritized for screening based on incidents of illicit discharges, land use, dumping reports, etc.?
- ✓ What parameters are being tested?
- ✓ How does the permittee prioritize sites for follow-up (e.g., magnitude and nature of suspected discharge)?
- ✓ Who conducts the sampling? What kind of training have sampling personnel received?
- ✓ What type of records are kept?
    - o Analytical results
    - o Date and duration (in hours) of the storm events sampled (rainfall data)
    - o Rainfall measurements or estimates (in inches) of the storm event which generated the sampled runoff (rainfall data)
    - o Duration (in hours) of the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event (rainfall data)
    - o Estimate of the total flow of the discharge sampled (stage and velocity)
- ✓ What analytical methods are used (i.e., 40 CFR Part 136)?
- ✓ What are the results of the initial sampling and analysis?
- ✓ Has the permittee made any changes to the monitoring program based on past results and experience?
- ✓ How have monitoring results been used to assess program components?
- ✓ Are monitoring data used to estimate pollutant loads for a TMDL?

Dry Weather Outfall Screening and Monitoring

- ✓ Does the permittee conduct dry weather screening at outfalls to identify non-stormwater discharges?
- ✓ Does the permittee have written screening procedures?
- ✓ What is the permittee's schedule for screening the sites?
- ✓ Are parts of the permit area prioritized for screening based on incidents of illicit discharges, land use, dumping reports, etc.?
- ✓ What parameters are being tested?
- ✓ How does the permittee prioritize sites for follow-up (e.g., magnitude and nature of suspected discharge)?
- ✓ Who conducts the sampling? What kind of training have sampling personnel received?
- ✓ What type of records are kept?
    - o Analytical results
    - o Date and duration (in hours) of the storm events sampled (rainfall data)
    - o Rainfall measurements or estimates (in inches) of the storm event which generated the sampled runoff (rainfall data)
    - o Duration (in hours) of the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event (rainfall data)
    - o Estimate of the total flow of the discharge sampled (stage and velocity)
- ✓ What analytical methods are used (i.e., 40 CFR Part 136)?
- ✓ What are the results of the initial sampling and analysis?
- ✓ Has the permittee made any changes to the monitoring program based on past results and experience?
- ✓ How have monitoring results been used to assess program components?
- ✓ Are monitoring data used to estimate pollutant loads for a TMDL?

Biological Monitoring

- ✓ Does the permittee perform biological sampling?
- ✓ Has a plan been developed to conduct biological sampling? If so, does the plan include the following:
    - o Identification of sampling stations and rationale for selection
    - o Location of known major MS4 outfalls discharging to water bodies in which sampling stations were chosen
    - o Land use activities near sampling stations
    - o Frequency of monitoring
- ✓ Who conducts biological sampling and what training have they received?

- ✓ Has the permittee made any changes to the monitoring program based on past results and experience?
- ✓ How have monitoring results been used to assess program components?

Ambient Monitoring

- ✓ Does the permittee conduct ambient monitoring to characterize water quality conditions in receiving waters?
- ✓ How were the sampling sites selected?
- ✓ Is sampling conducted both during dry weather and wet weather?
- ✓ What is the frequency of sampling?
- ✓ What parameters are analyzed? What sampling and analytical methods have been used?
- ✓ Does the permittee have a written protocol or procedures for this sampling program?
- ✓ Who conducts the sampling and what training have they received?
- ✓ Has the permittee made any changes to the monitoring program based on past results and experience?
- ✓ How have monitoring results been used to assess program components?
- ✓ Are monitoring data used to estimate pollutant loads for a TMDL?

DATA COLLECTION AND REPORTING

- ✓ What reporting requirements are included in the MS4 NPDES permit?
- ✓ If multiple permittees are covered, are there different requirements for the co-permittees and the "umbrella" group?
- ✓ For co-permittees or Phase II permittees that rely on other entities to implement required elements of the program, how are data provided or reported?
- ✓ How are the required data collected, tracked, and reported?
    - o Is there a database?
    - o Are there reporting forms?
- ✓ Are there internal reporting deadlines within the municipal program structure?
- ✓ Are the appropriate data being collected by the permittee to be able to measure effectiveness and determine if performance standards are being met?
- ✓ How are data disseminated to those who use them, if at all?

<u>In-Field Program Evaluation Activities</u>
In-field activities are not necessary to evaluate program management.

Common Issues Identified During Program Evaluations

- ✓ The permittee lacks necessary intradepartmental coordination on stormwater issues.
- ✓ The permittee does not describe a formal, coordinated program framework.
- ✓ The SWMP does not identify pollutants of concern or program priorities.

- ✓ The program does not have measurable goals to track and quantify progress towards desired outcomes.
- ✓ The "umbrella" group for multiple co-permittees has a program or plan, but nothing has been developed for each specific co-permittee to detail actual implementation or goals specific to each co-permittee's program.
- ✓ No SWMP planning document(s) exist to guide the implementation of SWMP components.
- ✓ The SWMP has not been revised and updated based on evaluations of effectiveness.

4.2 Public Education and Participation

Regulatory Requirements

EPA's federal NPDES regulations for the stormwater Phase I and Phase II are listed at right. NPDES MS4 permits must address these requirements and often include more specific provisions.

Public education is not addressed as a separate program area in the Phase I regulations. Two general public education requirements are contained in the illicit discharge detection and elimination program requirements, as well requirements for education of pesticide, herbicide, and fertilizer applicators and construction site operators. The latter two programs are discussed in greater detail in the MS4 Maintenance and Construction Activities sections of Conducting an Evaluation.

The NPDES Phase II regulation's minimum control measures include requirements for Public Education and Public Participation.

Common Activities

Public education efforts aim to project information to the audience, while the goal of a public participation and involvement program is to encourage volunteerism, public comment and input on policy, and activism in the community. Many activities can and often do achieve both goals, therefore many permittees combine the two into one public outreach program component and develop joint materials. For example, a brochure about stormwater impacts could also invite residents to participate in a stream cleanup. In addition, it is common for several co-permittees to combine funds and produce one set of public outreach materials to distribute regionally or simply use another permittee's materials.

Goals and Objectives

Although not specified in NPDES regulations, ideally a stormwater outreach program should have a strategy to address public education and participation. The outreach strategy should be outlined in a document that may only be a few pages but should establish who is responsible for specific tasks, how much is budgeted, and the dates of implementation (especially if the permittee has to apply for funding support) and completion.

A permittee's outreach program should include goals based on specific stormwater quality issues in the community or pollutants of concern as well as specific target audiences. The goals can be quantitative (i.e., numbers of classroom presentations per year) or qualitative (i.e., increased stormwater awareness among Spanish-speaking residents regarding illegal dumping demonstrated by awareness surveys). Goals can be short-term or long-term but should be designed to be reassessed on a regular basis. Goals should also be progressive; for example, a goal for the first two years may be based on increasing public awareness of certain issues, whereas a goal for

Federal NPDES Regulations

NPDES MS4 permits must address these requirements and often include more specific state requirements:

✓ Phase I MS4 Regulations
Public Education
40 CFR 122.26(d)(2)(iv)(B)
40 CFR 122.26(d)(2)(iv)(D)(4)
40 CFR 122.26(d)(2)(iv)(A)(6)

Public Participation
40 CFR 122.26(d)(2)(iv)(D)

✓ Phase II MS4 Regulations
Public Education
40 CFR 122.34(b)(1)

Public Participation
40 CFR 122.34(b)(2)

Resources

- ✓ EPA Menu of BMPs http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm
- ✓ Getting In Step http://www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf
- ✓ EPA Stormwater Month Outreach Materials and Reference Documents www.epa.gov/npdes/stormwatermonth
- ✓ Think Blue San Diego, an overview of San Diego's stormwater pollution prevention program http://www.thinkbluesd.org/why.htm
- ✓ CTIC Know Your Watershed http://www.ctic.purdue.edu/KYW/

subsequent years would be based on measurable changes in behavior as a result of increased awareness.

Though each permittee may select its own unique set of goals, the ultimate outcome of all programs should be to elicit specific changes in behavior that benefit water quality. Brochures and presentations are means to this end, but they do not necessarily indicate a meaningful and successful public education program.

Message Development

The permittee's stormwater outreach messages should be clear, specific, and tied directly to elements that each specific audience values, in addition to goals established in the SWMP. Multiple messages may be necessary to address various audiences or behaviors.

Target Audiences

An outreach strategy should identify target audiences a permittee wants to reach with appropriate messages. Target audiences can be segmented by geographic location, demographics, occupation, or behavior patterns. Selection of a target audience can be based on stormwater quality issues and behaviors to be altered. The permittee should determine what information the target audience needs, gather information on the profile of the target audience, and collect information on the barriers to reaching this target audience. As stormwater awareness is evaluated and the program evolves, the target audience may change as well.

Message Packaging

Permittees use various packages to deliver messages to different target audiences. The packages should be appropriate to the audience (i.e., demographic, employment, geographic location, etc.). Packages for messages can include brochures, TV and radio spots, videos, presentations, events, and other formats.

Distribution Mechanisms

There are many ways to distribute outreach messages and materials. Distribution methods should be specific to the message and audience. Often, co-permittees or other partners (i.e., nonprofit organizations, watershed groups, other government agencies) share the distribution costs to best use available resources. Often goals or permit requirements are tied to distribution; therefore, permittees should track distribution of materials, program-related presentations, and other delivery methods.

Evaluation Methods

Permittees can evaluate the effectiveness of an outreach strategy in a number of ways, but any method should be linked to established measurable goals. Some use public surveys to gauge changes in awareness or behavior of the target audiences. The surveys can be conducted in person at events, on the phone, or using Web-based survey tools. Others track quantifiable data such as brochures distributed, people trained, participation in events, volunteer hours, etc. Ultimately, permittees should track metrics showing the adoption of desirable behavior changes.

Public Participation Activities

Ideally, permittees give the public the opportunity to participate in the development, implementation, evaluation, and improvement of the stormwater program. At the very least, permittees need to notify the public about the availability of the SWMP and notice of intent and solicit comments. Some permittees have stakeholder workgroups that are involved in developing policy and programs. Many permittees encourage and facilitate involvement by coordinating or promoting community events and promoting volunteerism in the community through activities such as storm drain stenciling, stream cleanups, riparian tree plantings, and other programs.

Evaluating Public Education and Participation Programs

The public education and participation component of a SWMP may be implemented by one person or department (e.g., a communications office) or be a combination of efforts by many people, departments, or agencies. An evaluator should question the SWMP coordinator about key staff to talk with prior to the evaluation. It may be possible for the coordinator to relay all necessary information without having to track down numerous staff. It is also a good idea for you to request that copies of pertinent outreach materials be compiled to review during the evaluation or taken to review after.

Some permittees will want to present all stormwater public education activities as an independent program area, while other permittees describe education activities in each relevant SWMP component (for example, education of construction operators is addressed in the construction component or public education on illicit discharges is addressed in the illicit discharge component). An evaluator should take note of how the permittee organizes its education activities and adjust the evaluation process accordingly.

Before the Program Evaluation

An evaluator should review or obtain the following information prior to the evaluation:

Pre-Evaluation Checklist
- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report

- **MS4 NPDES permit provisions.** Review the permit requirements for public education and public participation to identify any specific requirements (such as the type of activities the program must include or the pollutants the program must address). The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP should describe the overall outreach structure of the program and any measurable goals.
- **Latest annual report.** The annual report should be reviewed to help you become familiar with the activities that have been conducted in the past and the progress made towards achieving measurable goals of the program component.

Records Review

The following records might help in evaluating the compliance and performance of the permittee's public education and participation program. Ask for copies of relevant information where it will help in writing a report or documenting a permit violation.

Documentation	What to Look For
Public outreach or communication strategy	Target audiences, specific stormwater messages, tracking methods, measurable goals, a plan to review and modify the strategy over time.
Stormwater Web site	Pamphlets, calendars of events, hotlines, contact information, access to stormwater permit requirements and SWMP documentation, general stormwater information, volunteer opportunities
Public awareness survey	Public awareness surveys may be available to assess either baseline awareness or movement towards measurable goals.

Elements to Address During the Program Evaluation

This Guidance presents common program activities and questions to consider during the program evaluation. Of course, a comprehensive program evaluation must be tailored to the specific issues associated with each permittee and should include more specific questions regarding the permittee's permit structure and management challenges.

GOALS AND OBJECTIVES

- ✓ Does the permittee have a strategy document for education and participation?
- ✓ Does the document include specific goals?
- ✓ On what are the goals based?
- ✓ Are the goals measurable? How?

MESSAGE DEVELOPMENT

- ✓ Have specific messages been developed for stormwater outreach?
- ✓ On what are the messages based? Pollutants of concern? General awareness? Problem target audience? All of the above?
- ✓ Are different messages used for different target audiences (i.e., children, homeowners, industry, etc.) or is one central message used for all?
- ✓ Do the messages encourage participation in stormwater-related activities?
- ✓ Do the messages educate about behavior changes that the audience can make to contribute to a solution?
- ✓ Have messages been developed specific to reducing illicit discharges with information about how to report them to the appropriate authorities?
- ✓ Have messages been developed to educate pesticide, fertilizer, and herbicide applicators (including homeowners) about ways to reduce stormwater pollution?

TARGET AUDIENCES

- ✓ Has the permittee identified target audiences for outreach efforts? How are these target audiences selected? What are the target audiences?
- ✓ What land use groups (i.e. industry, commercial businesses) has the permittee targeted?
- ✓ Have certain ethnic groups or nationalities been identified as audiences to be targeted based on an evaluation of local demographics?
- ✓ Have the target groups been reevaluated based on evaluation of the strategy and progress that has been made?
- ✓ Has the Phase I permittee targeted pesticide, herbicide, and fertilizer applicators (including homeowners) and construction site operators for outreach?
- ✓ Has the Phase II permittee targeted industries or commercial businesses of concern for outreach?

MESSAGE PACKAGING

- ✓ Does the permittee have a variety of written educational materials?
- ✓ Does the permittee have a variety of other packages (i.e., Web site, presentations, displays) for educational materials?
- ✓ Did the permittee produce the education and outreach materials in the different languages that are spoken in the community?
- ✓ Do the permittee's materials explain stormwater issues in easy-to-understand terms?

DISTRIBUTION MECHANISMS

- ✓ Does the permittee track distribution of materials to measure effectiveness?
- ✓ Is the permittee focused solely on distribution or is an effort made to evaluate the impact of the messages?
- ✓ Does the permittee use a variety of distribution mechanisms to target various audiences?

EVALUATION METHODS

- ✓ How does the permittee evaluate the effectiveness of the outreach strategy?
- ✓ Has the permittee conducted a public awareness survey?
- ✓ Which outreach materials have been the most effective in soliciting public involvement and participation? Changing audience behaviors? Increasing general stormwater awareness?
- ✓ Have any changes been made to the outreach strategy or materials based on an evaluation of effectiveness?

PUBLIC PARTICIPATION ACTIVITIES

- ✓ What opportunities does the permittee give to the public to review and comment on any changes to the SWMP, such as public comment via a Web site, a public meeting, or a stormwater advisory group?
- ✓ What volunteer opportunities (i.e., stream cleanups, storm drain stenciling) does the permittee coordinate or publicize to encourage the public to participate in stormwater-related activities?
- ✓ Does the permittee sponsor or promote any of the following activities?
    - o Beach/stream/lake cleanups
    - o Volunteer stream monitoring
    - o Stream clean-ups or equivalent activities
    - o Stormwater citizen panel

<u>In-Field Program Evaluation Activities</u>

The evaluation for this program area will be primarily conducted with the permittee in the office or by reviewing materials before or after the evaluation. However, evaluators can take note during other field activities to observe the stormwater educational materials available and distributed. For example, when visiting the permittee's permit counter, assess the types of stormwater outreach materials available to applicants for new construction projects. When driving around the permit area, observe if posters,

billboards, or other signs display stormwater messages. These types of field observations about the permittee's public education activities can help assess the effectiveness of the program.

Common Issues Identified During Program Evaluations

The following should be closely considered during evaluations of permittees:

- ✓ Permittees set inappropriate or immeasurable goals for activities.
- ✓ Permittees are not including key target audiences.
- ✓ Permittees are not customizing the materials for the target audience.
- ✓ Permittees are not developing materials for commonly spoken languages.
- ✓ Permittees are not distributing the materials adequately using appropriate methods for the target audience.
- ✓ Permittees are not facilitating involvement in program development, implementation, and improvement during the course of the permit term.
- ✓ Permittees are not coordinating or promoting events or activities that would improve water quality or change behaviors of concern.

4.3 MS4 Maintenance Activities

Regulatory Requirements

Applicable Phase I and Phase II federal NPDES regulations are listed at right.

General Permits

Although MS4 maintenance activities are addressed in MS4 NPDES permits, it is important to note that some permittees will also have coverage under industrial stormwater general permits or have individual permits for maintenance facilities that fall under one of the covered industrial categories, such as landfills, waste transfer stations, or transportation facilities.

Federal NPDES Regulations

NPDES MS4 permits must address these requirements and often include more specific state requirements:

- ✓ Phase I MS4 Regulations 40 CFR 122.26(d)(2)(iv)(A)
- ✓ Phase II MS4 Regulations 40 CFR 122.34(b)(6)(i)

Common Activities

Infrastructure Mapping and Characterization

Debris, **floatables**, sediment, metals, and other pollutants are caught in the MS4 and a regular program to inspect, clean, and repair components of this infrastructure will reduce the pollutants leaving the system and entering surface waters. A map of the MS4 is important for the permittee to plan for and track proper maintenance of inlets, catch basins, outlets, conduits, and management structures such as detention basins.

Public Streets Operation and Maintenance

The SWMP should address and include various practices for operating and maintaining public streets, roads, and highways that reduce the impact on receiving waters of discharges from municipal storm sewer systems. These practices should include regular street sweeping and proper use of BMPs during street maintenance activities. In addition, where applicable, permittees should consider deicing agent application methods that minimize the discharge of pollutants into the MS4, as well as salt and sand storage, fleet maintenance, fueling, and washing.

Flood Management

Permittees should assure that the impacts on the water quality of receiving water bodies are assessed in municipal or regional flood management projects and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from stormwater is feasible.

Public Facilities Operation and Maintenance

The SWMP should include a mechanism to inventory and assess the impact of stormwater runoff from municipal facilities. The inventory should include all facilities that treat, store, or transport municipal waste as well as industrial/commercial facilities (facilities covered by a general permit as well as those defined by the Industrial/Commercial Facilities program component). Facilities

Resources

- ✓ Menu of BMPs www.epa.gov/npdes/menuofbmps
- ✓ California Stormwater Quality Association's Municipal BMP Handbook www.cabmphandbooks.com/Municipal.asp
- ✓ National Management Measures to Control Nonpoint Source Pollution from Urban Areas http://www.epa.gov/owow/nps/urbanmm/index.html
- ✓ North Texas Council of Governments - Stormwater Pollution Prevention Training Module Series http://www.nctcog.org/envir/SEEclean/stormwater/program-areas/pollution_prevention/CD/Version_1/P2_Training_Materials.asp

MS4 Facilities

- ✓ Municipal maintenance yard
- ✓ Fleet maintenance facility
- ✓ Chemical storage facility
- ✓ Household hazardous waste facility
- ✓ Solid waste transfer station
- ✓ Animal control facility
- ✓ Salt storage facility

with activities characterized as a potential threat should be inspected and BMPs should be implemented to reduce water quality impact.

Pesticide, Herbicide and Fertilizer Application and Management
The SWMP should include a component to reduce pollutants associated with the application of pesticides, herbicides, and fertilizer. This program should include, as appropriate, educational activities, permits, certifications and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at permittee owned or operated facilities, such as playing fields and other recreational facilities.

Training and Education
To ensure that maintenance staff is knowledgeable and proficient in the newest and most effective approaches to minimizing stormwater pollution from facilities and activities, many permittees require annual BMP training for field staff. This training may be presented in-house or staff may attend trainings provided by the permitting authority or industry. It is important to cross-train or educate any contracted staff used for field work as well. Many permittees also provide general stormwater awareness training to all employees.

TIP:

MS4 permittees are not required to enforce the NPDES (state or federal) industrial stormwater general permit, but they are required to comply with this permit at their own facilities. This includes the submittal of a notice of intent, development of a stormwater pollution prevention plan (SWPPP) or equivalent, inspections, and other requirements specified in the applicable industrial stormwater general permit.

Evaluating MS4 Maintenance Programs

MS4 maintenance encompasses a large variety of facilities and activities necessary to operate and maintain a permittee's infrastructure, which include streets, facilities, and the storm drain system. MS4 maintenance activities typically are designed to maintain a certain level of service to maintain the aesthetics of public areas, provide public safety, maintain public infrastructure, and provide flood management, rather than for stormwater quality protection. When reviewing MS4 maintenance programs, however, an evaluator should focus on activities that might impact stormwater quality. The following should be evaluated:

1. How the permittee has inventoried all its infrastructure and facility maintenance activities
2. How the permittee has reviewed maintenance activities to assess potential impacts on stormwater quality
3. Whether the permittee has revised activities or implemented new measures to protect stormwater quality

MS4 maintenance staff should be trained on stormwater BMPs and principles, and have clear guidance on appropriate stormwater BMPs to use during typical maintenance operations and facilities management.

Various departments may be involved in the MS4 maintenance component of a SWMP. Within a municipality, the majority of functions normally are performed by public works staff. However, be sure to discuss the areas to be evaluated with the SWMP coordinator to ensure that the appropriate staff are available to interview during the evaluation. Departments or agencies that might need to be interviewed include streets and highways, facilities management, water authority, fire department, wastewater treatment plant, flood control district, solid waste, and parks and recreation. As previously stated, it is important to interview managers as well as field staff whenever possible.

Before the Program Evaluation

To prepare for the MS4 maintenance program evaluation, an evaluator should review or obtain the following information prior to the evaluation:

Pre-Evaluation Checklist
- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report
- ✓ NPDES-permitted municipal facilities
- ✓ Municipal facility inspection reports

- **MS4 NPDES permit provisions.** Review the permit requirements for the MS4 maintenance program to identify any specific requirements (such as a minimum street sweeping frequency). The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP planning document(s) should describe the activities and BMPs that the permittee has committed to implement and may include measurable goals that provide deadlines for program implementation.
- **Latest annual report.** The annual report should be reviewed to identify past activities and help you become familiar with the permittee's SWMP.
- **List of permittee-owned or -operated facilities with NPDES permits.** Try to obtain a list of industrial facilities owned or operated by the permittee that are covered by an NPDES industrial stormwater permit issued by the permitting authority (i.e., household hazardous waste collection facility). This list can be used during the program evaluation to determine whether the permittee is including the facilities that are covered by an industrial stormwater general permit in the inspection program and to understand the types of facilities present in the permit area. The list can also help identify potential sites for the field inspections.
- **MS4 maintenance facility inspection reports.** Review reports from inspections performed by the permitting authority within the permit area and talk to state inspectors to determine if there have been past stormwater violations at facilities owned or operated by the permittee.

Records Review

The following records might help in evaluating the compliance and performance of the permittee's MS4 maintenance activities. Ask for copies of relevant information where it will help in writing the report or documenting a permit violation.

Documentation	What to Look For

Tracking systems
✓ Catch basin cleaning
✓ Street sweeping
✓ Pump station maintenance
✓ Structural BMP maintenance
	▪ What type of water quality-related information is tracked (i.e., tons of material swept)
	▪ Does the permittee set priorities and goals for MS4 maintenance activities each year?
	▪ How are these priorities and goals established?
	  ▪ Pollutants of concern
	  ▪ Watersheds of concern
	▪ Review how these activities are summarized for the annual report

In-field inspection sheets	▪ What guidance is provided to inspectors or maintenance crews to ensure they're properly inspecting and maintaining stormwater infrastructure?

Documentation	What to Look For
Maintenance SOPs	▪ Review standard operating procedures or any employee manuals or fact sheets used by permittee staff to conduct their day-to-day activities to determine if stormwater BMPs are described
List of municipal facilities	▪ Have the facilities been prioritized based on potential water quality impacts? ▪ Are the facilities inspected? How often? Who inspects?
MS4 maintenance facility SWPPPs	▪ Are SWPPPs (or equivalent) for permittee-owned or -operated maintenance yards, wastewater treatment plants, public transit facilities that perform maintenance, or other facilities adequately addressing stormwater? ▪ When were the SWPPPs last updated?
Training schedule	▪ Review training records to determine how often training is provided, who is required to attend
Pesticides, herbicides, and fertilizers ✓Application records and protocols ✓Applicator certifications and training	▪ Has the permittee tracked the types and amounts of chemicals applied in the permit area? ▪ Does the permittee have state-certified pesticide applicators? ▪ Are the applicators' certifications up to date?
Flood management program	▪ Review the permittee's capital improvement project list for flood drainage or flood management projects. ▪ Review the permittee's watershed master plans or flood drainage master plans for flood management projects. ▪ What types of evaluation criteria have been used to prioritize the projects on the (CIP) list or in the watershed master plan (e.g., water quality impacts)? ▪ Determine whether permittee has a documented evaluation showing why it is not feasible to retrofit existing flood management projects.

Elements to Address During the Program Evaluation

Although the specific nature of a successful municipal program is not specified in NPDES regulations, it will generally be composed of the following components:

- Stormwater infrastructure management and maintenance
- Public streets operation and maintenance
- Flood management
- Public facilities operations and maintenance
- Pesticide, herbicide and fertilizer application and management, as well as erosion control, landscaping, and turf grass care

- Standards, BMPs, and outreach for municipal staff
- Training and education

For each of the elements listed above, this Guidance presents questions to consider during the program evaluation. Of course, a comprehensive program evaluation must be tailored to the specific issues associated with each permittee and should include more specific questions regarding the permittee's permit structure and management challenges.

STORMWATER INFRASTRUCTURE OPERATION AND MAINTENANCE

Infrastructure Mapping and Characterization

- ✓ Does the permittee have a map showing all inlets, outfalls, storm drain conduits, stormwater management facilities, and receiving water bodies?
    - o Does this map include catch basins and structural stormwater controls?
    - o Is the map readily available and used by maintenance field staff when performing maintenance activities?
    - o Is the map in hard copy format only or is it also in a geographic information system (GIS)?
- ✓ Are infrastructure assets or components named or numbered to better track necessary maintenance and repairs?

TIP:

A map is also required for the illegal connection and illicit discharge detection and elimination programs described in this Guidance. The maps developed for MS4 maintenance and illegal connection and illicit discharge programs can be the same to best use resources.

- ✓ Is information regarding stormwater infrastructure maintained in a database or mapping system? What types of data are maintained?
    - o Type of structure or asset
    - o Location (address, latitude/longitude)
    - o Photo
    - o Date built
    - o Date last inspected
    - o Date last cleaned/maintained

Catch Basin Cleaning

- ✓ Does the permittee have a schedule for routine maintenance or cleaning of catch basins?
    - o How many are cleaned and how often?
    - o Has the permittee targeted certain areas for more frequent maintenance? Does this targeting help minimize stormwater pollution?
    - o Does the permittee set goals for how many basins are inspected and cleaned each year?
    - o How does the permittee track and record cleaning and maintenance needs?
    - o What information is documented? Does the permittee track which catch basins are cleaned, how much material is removed, and so forth?
    - o How does the permittee use the data collected to further its program or evaluate program effectiveness? Are the data used to help prioritize cleaning frequency? Are they used to identify areas for targeted outreach?
- ✓ What are the permittee's procedures for disposing of waste removed from catch basins or storm drains?
    - o Does the permittee flush material that could potentially discharge to surface water?

- If the material is removed using a wet vacuum, how is the material dewatered? How is the decanted water disposed?

- ✓ Does the permittee have a schedule for routine maintenance or inspection of storm drain pipes?
- ✓ What are the permittee's maintenance procedures for cleaning clogged storm drain pipes?

Stormwater Management Structures

- ✓ Are catch basins and other inlet structures marked so that the public knows they drain to surface waters?
- ✓ Has the permittee inventoried the type and location of public stormwater management structures in its jurisdiction? How are the data collected and stored?
  - Pump stations
  - Drainage structures (debris basins, detention basins, regional ponds, etc.)
  - Structural treatment controls
  - Open channels
- ✓ How is vegetation maintained in grassed swales, rain gardens, pond perimeters, and other vegetated stormwater controls?
- ✓ Has the permittee mapped private stormwater management structures?
- ✓ How often are these facilities inspected?
- ✓ Are the stormwater management structures regularly maintained by the permittee?
  - Are records kept of material and debris removed during maintenance?
  - How is maintenance conducted? Are chemicals used to maintain vegetation and pests?
- ✓ How does the permittee use the data collected to further its program or evaluate program effectiveness? Are the data used to help prioritize cleaning frequency? Are they used to identify areas for targeted outreach based on type and volume of materials removed?

TIP:

Governmental Accounting Standards Board (GASB) Statement No. 34, Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments (Statement 34) establishes new requirements for the annual financial reports of state and local governments. The Statement was developed to make annual reports easier to understand and more useful to the people who use governmental financial information to make decisions. Statement 34 requires governments to document and report existing infrastructure and depreciate their capital assets.

Permittees can utilize the information obtained through this required reporting to inventory assets such as maintenance facilities, stormwater management structures and MS4 infrastructure (i.e. outfalls, storm sewer pipes, catch basin).

http://www.gasb.org/

PUBLIC STREETS OPERATION AND MAINTENANCE

Street Sweeping

- ✓ Does the permittee regularly sweep streets? Public parking lots?
- ✓ What is the schedule for street sweeping?
- ✓ Are areas scheduled for sweeping based on aesthetics only or is consideration given for reducing impacts on the stormwater management infrastructure and surface water?
- ✓ What types of sweepers are used? Wet or dry?

TIP:

It is a good idea to question both managers and field staff regarding BMPs used. It is helpful to ascertain the level of understanding at the field level as well what types of BMPs are deemed appropriate and feasible for the specific MS4.

- ✓ How is street-sweeping debris disposed? If the debris is dewatered, how is this done? How is the decanted water disposed?
- ✓ Are records kept of the amount of debris collected?
- ✓ How does the permittee use the data collected to further its program or evaluate program effectiveness? Are the data used to help prioritize cleaning frequency?

Yard Debris Reduction and Disposal

- ✓ Does the permittee offer guidance or services to encourage mulching and/or composting of grass clippings and other yard debris?
- ✓ Does the permittee offer seasonal recycling or disposal services to collect leaf litter, Christmas trees, yard debris, or other seasonal organic materials?

Public Streets, Roads, and Highways Maintenance

- ✓ What types of public streets, roads, and highways operation and maintenance practices and procedures are performed by the permittee?
- ✓ Are BMPs used by field crews to minimize stormwater impacts during road maintenance or repair activities?
- ✓ What types of BMPs are used? Discuss BMPs used for such activities as:
    - o Ditch cleaning
    - o Sidewalk repair
    - o Asphalt patching
    - o Curb and gutter repair
    - o Street striping
    - o Sign painting
    - o Maintaining dirt and gravel roads (preventing erosion, dust control)

Deicing Activities

- ✓ What types of deicing agents does the permittee use? If salt is used, has the permittee investigated alternatives?
- ✓ How are deicing agents, sand, or other materials stored? Is the material covered and/or bermed to prevent runoff?
- ✓ Does the permittee track the locations and volumes of deicing agents, sand, or other materials applied?
- ✓ Is the material picked up after the snow/ice event is concluded? Is there a schedule for picking it up after an event?

FLOOD MANAGEMENT

- ✓ Does the permittee have an inventory of structural flood management structures?
- ✓ Have these structures been assessed to determine whether retrofitting could provide additional water quality benefits?
- ✓ How often are flood management projects inspected and/or maintained?
- ✓ Are new flood management projects being designed or planned to include water quality considerations?

PUBLIC FACILITIES OPERATION AND MAINTENANCE

Facility Inventory

- ✓ Does the permittee have an inventory of public facilities? At a minimum, this list should include the following:
    - o Public works yards
    - o Public transit facilities
    - o Wastewater and domestic water treatment plants
    - o Sanitary sewer system overflow locations
    - o Public parks/open areas
    - o Public parking lots
    - o Public buildings
    - o Landfills and hazardous waste disposal sites, transfer locations, or storage facilities
- ✓ Have the facilities been inspected and assessed for water quality impacts?
- ✓ Are any facilities required to apply for coverage under a general industrial permit? Do these facilities have SWPPPs?

Maintenance Yard Management

- ✓ If the permittee is a municipality, does the municipal public works yard have a SWPPP?
- ✓ Who is responsible for implementing and maintaining the SWPPP?
- ✓ Who is responsible for periodically inspecting the yard for stormwater compliance?

Parks Operation and Maintenance

- ✓ Are there adequate trash enclosures available at park facilities? Are they emptied regularly?
- ✓ Does the permittee provide any stormwater education or signage at parks and other areas?
- ✓ How are public restrooms cleaned and maintained? What chemicals are used? How is cleanup water disposed of?
- ✓ How are public pools maintained? How is the chlorinated water disposed of?
- ✓ Does the permittee include pet waste disposal stations with signage and baggies in public parks?
- ✓ What BMPs are used to address:
    - o Stormwater impacts from turf grass maintenance?
    - o The transport of pesticides, herbicides, and fertilizers by stormwater?
    - o Erosion?
- ✓ What types of vegetated BMPs are implemented at parks (e.g., alternative landscaping to minimize high-maintenance turf grass, streamside buffers, reduced mowing frequency, etc.)
- ✓ Does the permittee implement water conservation measures at its park facilities?

Building Operation and Maintenance

- ✓ Are the permittee's parking lots regularly swept?
- ✓ How are enclosed parking structures and other public buildings cleaned? If power washing is used, are BMPs implemented to protect storm drain inlets?

Sanitary Sewer System Maintenance, Overflow, and Spill Prevention

- ✓ Does the permittee have a program to mitigate or prevent **sanitary sewer overflows (SSO)** from entering the MS4?
- ✓ Have flow pathways from SSO locations to catch basins or other points of entry to the MS4 been identified?
- ✓ Have spill prevention and cleanup plans been prepared?
- ✓ Does the permittee have a written procedure to ensure that the MS4 is protected from a sewage overflow or spill? Do the procedures include protection of the storm drain system during and after the cleanup of a spill or overflow?
- ✓ Does the permittee implement a reporting protocol to ensure that all spills and overflows are reported to the appropriate authorities or the department designated to collect and report the permittee's annual report?
- ✓ If the jurisdiction includes residential homes with septic tanks, how does the permittee educate homeowners about proper maintenance of the systems?

Water Supply Operation and Maintenance

- ✓ Have procedures been developed to ensure that field staff integrate stormwater management BMPs into their operation and maintenance activities?
- ✓ Are BMPs implemented to address the testing and flushing of new or existing water lines?
- ✓ Are BMPs implemented to address hydrant testing?
- ✓ Are BMPs implemented to address maintenance activities required to maintain underground water lines (e.g., trenching, excavation)?
- ✓ Does the permittee coordinate source water protection efforts with the stormwater program?

Chemical and Hazardous Material Use and Disposal

- ✓ What types of chemicals or hazardous materials are used by the permittee?
- ✓ Where are these materials stored?
- ✓ Has the permittee implemented an alternative materials program to reduce the use of hazardous materials?
- ✓ Has the permittee implemented an inventory reduction program to reduce the quantity of chemicals and hazardous materials stored and used?
- ✓ Does the permittee have a household hazardous waste collection center for the public?
    - o Are records of the quantity of materials collected maintained by type of material?
    - o How does the permittee notify the public of these sites?
    - o Does the permittee have special household hazardous waste collection days?
- ✓ How does the permittee use the data collected to further its program or evaluate program effectiveness? Are the data used to help prioritize maintenance frequency? Are they used to identify areas of targeted outreach?

PESTICIDE, HERBICIDE AND FERTILIZER APPLICATION AND MANAGEMENT

- ✓ What kind of program has been established to address pollutants associated with the application of pesticides, herbicides, and fertilizer at public facilities?
- ✓ Are the permittee's fertilizer/pesticide applicators certified? Are permits or other certifications required?
- ✓ Where are the chemicals stored? Are appropriate procedures and secondary containment followed?
- ✓ Is there a pesticide/fertilizer application plan?
- ✓ Does the permittee practice integrated pest management (IPM) or use alternatives to pesticides?
- ✓ How does the permittee implement alternative landscaping to minimize the use of fertilizers and pesticides?
- ✓ What types of educational activities does the permittee conduct for applicators?
- ✓ What types of BMPs are used during application of pesticides in public rights-of-way?
- ✓ What types of BMPs are used during application of pesticides at municipal facilities such as parks?

STANDARDS, BMPS, AND OUTREACH

Municipal Staff

- ✓ Have standard operating procedures or their equivalent been developed to ensure that municipal field staff integrate stormwater quality BMPs into their daily activities?
- ✓ Have BMPs or standards been officially adopted by the permittee for use by municipal field staff?
- ✓ What reference materials or guidance documents are provided to field staff regarding BMP specifications and details?
- ✓ How does the permittee ensure that staff are fulfilling their responsibilities as outlined in standard operating procedures? Do managers provide oversight on a regular basis?

Contracted Services Staff

- ✓ Does the permittee require contractors to incorporate stormwater quality BMPs into their activities?
- ✓ How are BMPs required? Are the requirements outlined in requests for proposals? Are they included in contracts?
- ✓ Have BMPs or standards been officially adopted by the permittee for use by contractual staff?
- ✓ What reference materials or guidance documents are provided to contractual staff regarding BMP specifications and details?
- ✓ How does the permittee ensure that contractors are fulfilling their responsibilities as outlined in their contracts? Are inspections performed? Are periodic reports submitted?

TIP:

Educational programs for pesticide, herbicide, and fertilizer applicators used by the permittee may be addressed during the public education and participation portion of the evaluation.

General Public

- ✓ Does the permittee provide any information to the public regarding:

- Cleaning up after pets
- Household hazardous waste disposal
- Oil recycling
- Litter reduction

TRAINING AND EDUCATION

- ✓ What type of general stormwater training is provided to staff that are not involved in field activities? How often?
- ✓ How are new employees trained?
- ✓ What types of activity-specific training is provided to field staff? Is information on specific BMPs provided?
- ✓ Is any training provided to contract staff?

In-Field Program Evaluation Activities

The primary in-field evaluation activity is an inspection of the permittee's public works yard(s) or other type of permittee owned or operated facility (i.e. fleet maintenance). The intent of this inspection is to verify that activities are performed as described in the SWMP. The facility should be inspected as if it were a typical industrial facility. During the inspection, look for the following:

TIP:

Other MS4 facilities, such as parks, marinas, and household hazardous waste collection facilities, should be visited if there is adequate time.

- ✓ Are chemicals, bulk materials, or other potential pollutants stored outside? Is there secondary containment? Are the materials covered?
- ✓ Where are the permittee's vehicles washed? Are wash racks and dewatering areas plumbed to sanitary sewers, if allowed? If not allowed, are wastewaters from wash racks and dewatering areas prohibited from entering the MS4?
- ✓ Where are the permittee's vehicles maintained? If outside, what BMPs are used to prevent polluted runoff?
- ✓ Does the facility have structural stormwater BMPs (e.g., stormwater detention ponds, stormwater filter devices) installed?
  - If so, how are they maintained?
  - What is the frequency of maintenance?
- ✓ Are inoperable vehicles stored and maintained in a way to prevent polluted runoff and leaching of contaminants to groundwater?
- ✓ Are storm drain inlets at the yard free of debris and regularly cleaned?
- ✓ Is the yard swept regularly? Are there oil stains and spills at the yard?

An additional in-field evaluation activity could include visiting maintenance staff as they conduct maintenance. For example, you could visit staff as they clean catch basins, perform street repairs, or conduct other similar activities to ascertain whether stormwater BMPs are being implemented and identify whether staff are knowledgeable about BMPs.

Document all findings in the field in as much detail as possible. An MS4 Facilities Inspection Worksheet has been included as Appendix C to assist in this documentation.

Common Issues Identified During Program Evaluations

The following are some typical problem areas associated with MS4 maintenance programs. These areas should be closely considered during evaluations:

- ✓ The permittee's MS4 maintenance staff lack training on and awareness of stormwater management BMPs.
- ✓ Permittee staff lack adequate guidance (e.g., MS4 maintenance BMP manual, SOPs, fact sheets) on proper stormwater management BMPs.
- ✓ Stormwater BMPs and procedures are not incorporated during routine MS4 maintenance activities.
- ✓ Maintenance yards lack SWPPPs and adequate controls to prevent stormwater contamination.
- ✓ Contractual staff performing operation and maintenance activities for the permittee are not required to consider stormwater quality and implement appropriate BMPs.

4.4 Construction Activities

Regulatory Requirements

EPA's federal regulations for the stormwater NPDES Phase I and Phase II regulations are listed at right. NPDES MS4 permits must address these requirements and often include more specific state requirements.

General Permits

As described above, stormwater Phase I and Phase II MS4 permittees must implement a SWMP that includes erosion and sediment controls on construction sites disturbing at least one acre. In addition to the regulation of construction site stormwater at the local level, EPA regulations also require construction sites disturbing greater than one acre to obtain an NPDES permit. This permit can be issued by the state permitting authority or EPA, depending on whether the state has been delegated the NPDES authority. This dual regulation of construction sites at both the local and state or federal level can be confusing to permittees and construction operators.

Although there are many similarities between the NPDES construction general permit and the MS4 construction program requirements, Municipalities are not required to ensure that local construction projects comply with NPDES construction general permits. Federal NPDES MS4 regulations describe broad requirements for a stormwater program to control construction site runoff to the MS4 and give the permittees flexibility in designing a local program to meet their needs. However, to avoid duplication and confusion between the two programs, some permittees choose to require the same BMPs and plan submittals (i.e., SWPPPs) as required by NPDES regulations.

Common Activities

Ordinance/Legal Authority

Many municipal permittees address legal authority for construction site stormwater runoff control in a grading or stormwater ordinance. The ordinance(s) should specify which sites are required to implement controls (i.e., MS4 regulations require all sites greater than one acre, but many permittees use a smaller area or volume threshold, such as 50 cubic feet of earth moved or proximity to water bodies). The ordinance should require erosion and sediment control BMPs to be implemented and maintained, a performance standard, and penalties for noncompliance.

Construction Site Inventory

The permittee should have an inventory of active and completed construction projects that includes information about the site and inspections that the permittee has conducted, including inspection findings and follow-up (letters, enforcement actions, additional inspections). Permittees should consider prioritizing the inventory to

Federal NPDES Regulations

NPDES MS4 permits must address these requirements and often include more specific state requirements:

- ✓ Phase I MS4 Regulations 40 CFR 122.26(d)(2)(iv)(D)
- ✓ Phase II MS4 Regulations 40 CFR 122.34(b)(4)

TIP:

MS4 permittees are not required to enforce the NPDES (state or federal) construction general permit, but they are required to comply with this permit for their own public construction projects (e.g., capital improvement projects, road construction). This includes the submittal of a notice of intent, development of a SWPPP or equivalent, inspections, and other requirements specified in the state's construction general permit.

Resources

- ✓ Menu of BMPs http://www.epa.gov/npdes/menuofbmps
- ✓ Construction Industry Compliance Assistance Center http://www.cicacenter.org/
- ✓ International Erosion Control Association http://www.ieca.org/
- ✓ Kentucky Erosion Prevention and Sediment Control Field Guide http://www.tetratech-ffx.com/wstraining/pdf/esc_guide.pdf

better target inspections based on project size, location, threat to water quality, or other factors. The permittee should also develop procedures for the receipt and consideration of complaints submitted by the public. Ideally, this information would be managed in a database and linked to a GIS for optimum tracking.

Resources (continued)

- ✓ California Stormwater Quality Association's Stormwater Best Management Practice Handbooks http://www.cabmphandbooks.com/Construction.asp
- ✓ MPCA Inspection guide and compliance assistance toolkit http://www.pca.state.mn.us/water/stormwater/index.html

Construction Requirements and BMPs

While the legal authority described above should require BMPs at construction sites, a permittee should also have additional specifications or guidance on what types of BMPs are expected at sites. These requirements and standards and specifications for BMPs should be readily available to project applicants.

Plan Review Procedures

The review of erosion and sediment control plans (or SWPPPs if required under an NPDES construction permit) should be based on formal review specifications, a checklist, or similar criteria. Plan review staff should document the BMPs considered, whether they were addressed on the plans, and any identified deficiencies.

TIP:

You should have a clear understanding of the plan review and approval process and how stormwater and erosion and sediment control requirements are included in this process.

Some municipal permittees require that projects submit a copy of the **notice of intent (NOI)** that has been submitted to the State or EPA before approving a project. In some states, the state requires that the permittee receive local erosion and sediment control approval prior to submitting a NOI. At a minimum, permittees should make sure that project applicants are aware of the requirement to apply for NPDES permit coverage for projects disturbing greater than one acre.

Some municipal permittees use contract staff to review some or all plans. Be sure to review plans completed by contractual as well as municipal employees.

Construction Site Inspections

A key element of the construction component is the frequency at which sites are inspected. Some permittees identify a minimum frequency of inspections (such as weekly and/or following a rain event) for all projects. Other permittees will rely on building inspectors to conduct erosion and sediment control inspections at the same time as other types of required inspections (e.g., electrical). This approach, however, can result in sites not being inspected for long periods of time if the building inspector is not called out for an inspection. Also, building inspectors are not necessarily trained to recognize erosion and sediment control problems or have other priorities besides stormwater.

TIP:

Some municipal permittees have different inspectors for their public and private projects, be sure to evaluate each in the field.

Inspections are often targeted to specific types of sites or during specific periods (especially immediately following a rain event). For permittees with numerous active construction projects, it is recommended that a prioritization process be developed to ensure that the sites with the greatest threat to water quality are considered high priority and inspected more frequently. Inspection results should be documented using paper forms or electronic databases.

Program Support and Resources
Permittees should have an established source of funding for their construction program, including adequate resources for frequent inspections and plan review. Funds often come from fees paid by the construction operators. If general funds are used to support the program, permittees should ensure that construction inspections are a line-item appropriation not subject to reduction or elimination based on board politics or budget constraints.

Enforcement
Permittees should have an established, escalating enforcement policy that clearly describes the action to be taken for common violations. Enforcement authority typically includes verbal and written warnings, fines, and "stop work" orders. Verbal warnings should be documented in addition to all written violation notices. The enforcement policy should also address how repeat or serious violations will be addressed, including referral of the case to the NPDES permitting authority in the most egregious cases.

TIP:

Review enforcement cases to assess whether the permittee is adequately ensuring compliance. Lack of fines, "stop work" orders, or other enforcement actions do not necessarily indicate that the permittee's enforcement program is inadequate. A lack of enforcement cases could be the result of an effective inspection program, or it could indicate problems with the inspection records, inspector training, inspection procedures, or even the lack of commitment from the permittee to escalate enforcement.

Training and Education
A SWMP should include training to plan review and inspection staff. This training should include classroom presentations, in-field training, and follow-up evaluations to determine whether the training was effective. Although some permittees also provide training to construction operators, most simply provide educational materials such as fact sheets or brochures that describe local requirements and recommended BMPs.

Public Construction Projects
Public construction projects must comply with both the local program and the applicable NPDES construction general permit (state or federal). This requires the permittee to take on dual roles as both local regulator and permittee. Permittees must apply the same local requirements to public construction projects as are required of private projects. Some permittees develop and design public construction projects in-house without direct involvement from the department that reviews most private construction projects; therefore, it is important that the public project designers are trained and proficient in stormwater BMPs as well. If a permittee hires outside designers for public projects, it is important that stormwater guidelines be provided to them to ensure compliance with local and NPDES permit requirements.

After the project is designed, many permittees will hire contractors to build the project. Interested applicants submit proposals to bid on the project. To ensure that successful applicants will abide by all stormwater requirements, it is recommended that the request for proposals (RFP) include specific language regarding installation and maintenance of all BMPs. Many permittees also include additional language in subsequent contracts (if there is a document separate from the proposal) obligating contractors to appropriate stormwater measures and outlining potential enforcement penalties (i.e. delayed or reduced payment). An evaluation of public construction projects should include a review of RFP or contract language relating to stormwater controls.

Evaluating Construction Programs

The evaluation of a permittee's construction program should focus on the regulatory mechanism to require and enforce the program, plan review procedures, and erosion and sediment control inspection procedures. The evaluation should begin with a thorough review of the permittee's ordinances, standards,

approved plans, and other relevant written materials. Ask staff to walk through the planning and approval process from initial plan receipt to final approval.

You should determine how erosion and sediment control BMPs are required in construction site plans and how they are implemented and enforced in the field. Inspectors from multiple departments might also inspect different portions of a development project. For example, building department inspectors may be charged with site inspections during the construction of the buildings, whereas public works inspectors may be responsible for the inspection of construction activities within the right-of-way, such as streets, sewer, and water. Various departments may inspect a site during different stages of the project. You must be sure to interview all applicable staff and departments, which could include building, planning, engineering, or public works. Questioning planners and engineers in addition to questioning inspectors is helpful in determining how well various staff work together to achieve "on the ground" BMP implementation.

Some municipal permittees manage public construction projects (including capital improvement projects or CIPs) differently than private construction projects, for example, in some communities private projects are reviewed and approved by the planning or building department, whereas public projects may be entirely planned, reviewed, approved, and developed by the public works department. Make sure you distinguish between these two types of projects during the evaluation, and if necessary, repeat the same questions for both private and public projects.

Before the Program Evaluation

To prepare for the construction program evaluation, an evaluator should review or obtain the following information:

Pre-Evaluation Checklist
- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report
- ✓ State or EPA Construction General Permit
- ✓ List of NPDES construction projects
- ✓ NPDES Construction inspection reports

- **MS4 NPDES permit provisions.** Review the permit requirements for the construction program to identify any specific requirements (such as a minimum inspection frequency). The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP planning document(s) will describe the activities and BMPs it is committed to implement and include measurable goals that provide deadlines for program implementation.
- **Latest annual report.** The most recent annual report should be reviewed to identify past activities and help the inspector become familiar with the permittee's program.
- **State or EPA NPDES Construction General Permit.** You should be very familiar with the requirements of the state or EPA's construction general permit, whichever applies, to ensure that conflicts between the SWMP and the state or EPA permit can be identified and violations of the state or EPA permit can be found.
- **List of NPDES construction projects.** Obtain a recent list of construction projects within the permit area that have been issued coverage under an NPDES general permit by the permitting authority (one acre or greater disturbed area). This list can be used during the program evaluation to determine whether the permittee has any public construction projects. The list can also help identify potential construction sites for field inspections. The list can also be crosschecked with a similar list requested and obtained from the permittee. Obtain information such as the operator name, name of the construction site, address, size, and other relevant information.
- **NPDES construction inspection reports.** Review inspection reports from construction inspections in the permittee's jurisdiction conducted by the permitting authority and/or EPA. Talk

to state or federal construction inspectors to determine if there have been past stormwater violations at construction sites in the permitted area and any role the permittee played in resolving the violations.

Records Review

The following records might help in evaluating the compliance and performance of the permittee's construction program. Ask for copies of relevant information where it will help in writing a report or documenting a permit violation.

Documentation	What to Look For
Local ordinances	One or more of the following ordinances may be used by a municipal permittee to regulate erosion and sediment control. ▪ Grading ordinance ▪ Erosion control ordinance ▪ Stormwater ordinance ▪ Landscaping ordinance ▪ Health and safety codes
Design standards, BMP manuals, and fact sheets.	These can be state or local standards or be taken from a non-regulatory source
Construction plans reviewed and approved by the permittee	Where possible, try to review the plans for projects that you will also visit during the field portion of the evaluation
Construction project inventory or database	▪ Does one exist? ▪ How often is it updated? ▪ What is the source for the inventory?
Enforcement escalation response plan or procedure	▪ Is the enforcement process documented and codified? ▪ Are roles of individuals or departments clearly defined?

Elements to Address During the Program Evaluation

Although not specified in detail in NPDES regulations, a successful construction program will generally be composed of the following elements:

- Ordinance/legal authority
- Construction project inventory
- Construction requirements and BMPs
- Plan review procedures
- Construction site inspections

- Program support and resources
- Enforcement/referrals
- Training and education

The common program elements are the key issues to consider during the review.

ORDINANCE/LEGAL AUTHORITY

- ✓ What legal authority does the permittee have to require erosion and sediment control BMPs on construction sites and to ensure compliance?
- ✓ Does the permittee's legal authority address stormwater quality for all projects disturbing at least one acre?
- ✓ What exemptions does the ordinance or other legal authority allow?
- ✓ Does the legal authority authorize the permittee to require erosion and sediment control plans?

CONSTRUCTION SITE INVENTORY

- ✓ How does the permittee track construction projects?
- ✓ What information is collected?
    - o The number and status (active/inactive/completed) of construction sites
    - o The number, frequency, results, and follow-up actions resulting from inspections
    - o The actions taken to resolve the issues and dates when compliance was achieved.
    - o The number and type of enforcement actions taken at sites in violation
    - o Complaints submitted by the public
- ✓ Does the inventory include construction sites disturbing less than 1 acre?
- ✓ What is the threshold for tracking projects?
- ✓ Does the inventory track which sites have submitted an NOI for coverage under a state/EPA construction general permit?
- ✓ How is the inventory updated? How often?
- ✓ Does the permittee prioritize projects for more frequent or targeted inspections?
    - o If yes, based on what criteria?

CONSTRUCTION REQUIREMENTS AND BMPS

- ✓ What technical guidance (e.g., BMP manual or fact sheets) does the permittee use as the standard for design and selection of nonstructural and structural construction BMPs?
    - o Are project applicants required to follow these technical manuals?
    - o Does the guidance set minimum operation and maintenance requirements for BMPs?

TIP:

You should ask the permittee for a copy of the information packet that they provide to new project applicants. What type of stormwater information is included? Does it describe the types of BMPs and stormwater requirements that could apply to their project?

- Does the guidance include installation requirements for the BMPs?
- Does the guidance provide proper siting and use criteria for BMPs to ensure that adequate BMPs are being selected and implemented?

✓ Does the permittee provide guidance as to recommended BMPs to be used?

✓ Does the permittee have different requirements or standards for different times of the year (i.e., during the rainy season vs. the dry season)?

PLAN REVIEW PROCEDURES

✓ Does the permittee hold pre-application meetings on any construction projects? Are stormwater and erosion and sediment control requirements addressed at these meetings?

✓ Is there any plan review coordination with other city departments such as smart growth, redevelopment, traffic engineering, etc.?

✓ What is the permittee's threshold for plan review? (For example, does the permittee review plans for all projects disturbing greater than 1 acre, or do they use another threshold?)

✓ Does the permittee apply standard conditions that incorporate erosion and sediment control requirements into its plan review process?

- Get a copy of the standard conditions to determine if they specifically address erosion and sediment control

✓ Do the plan reviewers verify whether the project applicant has submitted an NOI to the state or EPA? Is evidence of NOI submission required before a plan can be approved or a local permit issued?

✓ Do plan reviewers use specific criteria or a checklist when reviewing plans?

✓ Does the permittee consider during the review process whether the construction project discharges to a TMDL/impaired water?

✓ When reviewing plans approved by the permittee, you should:

- Look for whether adequate BMPs are included on plans, details, and drawings for the installation of certain BMPs when applicable, what types of standard conditions or notes are included, and whether maintenance requirements are specified.
- Are inadequate or incomplete plans automatically returned to the applicant? Are these returns accompanied by an explanation of what is needed for approval?
- Are BMPs addressing other construction activities, such as materials storage and waste disposal, incorporated into the construction plans?
- Do the plans include notes addressing the prohibition of non-stormwater discharges?
- Were comments provided by the permittee to the project proponent reasonable and appropriate?

TIP:

You should select at least 2 to 3 approved projects with erosion and sediment control plans to review with the permittee. Try to choose different project types (residential, commercial) and sizes. Also review at least one public project plan to see if the permittee is applying adequate standards to municipal construction.

CONSTRUCTION SITE INSPECTIONS

- ✓ Does the permittee adequately inspect all phases of construction?
  - o Clearing and grubbing and site preparation
  - o Mass grading and public infrastructure/utility construction
  - o Building construction and final grading
  - o Final stabilization
- ✓ What departments are charged with erosion and sediment control inspections? Is the department responsible based on the location of the site (i.e. right-of-way vs. building site) or phase of development (i.e., grading vs. building)?
- ✓ Do the inspectors use a checklist or inspection form during each inspection?
- ✓ How many inspectors does the permittee use to verify erosion and sediment control compliance at construction sites?
- ✓ Does this number appear adequate to assess active construction occurring in the permitted area? Compare this to the total number of construction sites that need to be inspected at any one time (number of inspections per construction site per year). Consider project durations and phasing, local conditions (e.g., dry vs. wet seasons), and additional duties assigned to inspectors.
- ✓ Does the permittee have an established prioritization process for establishing inspection frequency? If so, on what factors is the prioritization based (i.e., size, proximity to water body, sensitive areas)?
- ✓ How often are sites inspected?
- ✓ Does the permittee target inspections during and immediately after wet weather events? If so:
  - o What size rain event triggers an inspection?
  - o How soon after a rain event?
- ✓ Is there an established rainy season for the area? Are sites inspected prior to the start of the rainy season to determine preparedness?

TIP:

Review inspection records to determine how the permittee corrects identified problems. If an inspection report identifies missing BMPs or a non-stormwater discharge, verify that there is an inspection record showing that the site was reinspected within a reasonable timeframe. Was the problem corrected?

PROGRAM SUPPORT AND RESOURCES

- ✓ Does the program have a dedicated source of funding to support plan review staff and inspectors?

ENFORCEMENT

- ✓ What types of enforcement actions are provided for in applicable ordinances (e.g., notices of violation, “stop work” orders, fines)?
- ✓ Is use of these actions outlined in an established, escalating enforcement policy?
- ✓ Review with the permittee statistics on enforcement of construction site erosion and sediment controls.
  - o How many enforcement actions are taken per year?
  - o Are follow-up inspections conducted to verify compliance?

- ✓ Are there limitations on the permittee's enforcement authority (e.g., limits on the dollar amount of fines, inability to issue civil penalties)?
- ✓ Do staff feel that their enforcement authority is adequate to achieve compliance on construction projects?
- ✓ What is the relationship with the City Attorney or other relevant prosecuting authority?

TRAINING AND EDUCATION

Staff training

- ✓ What type of training do construction inspectors receive? Are plan reviewers trained on erosion and sediment control BMPs and requirements?
- ✓ How often is training conducted? How many staff have been trained?
- ✓ What type of follow-up is conducted by the permittee to verify that the training is effective?

Construction operator education

- ✓ What types of educational materials have been developed and distributed to construction operators?
- ✓ How are they distributed? At the permit desk? During inspections?
- ✓ What type of training does the permittee provide or advertise to local construction operators?
- ✓ How often is this training conducted? How many construction site operators have been trained?
- ✓ Are contractors and developers required to attend?
- ✓ Does the training cover any of the following?
  - o Local and state erosion and sediment control requirements and permits
  - o Proper erosion and sediment control BMP design and installation
  - o Maintenance requirements for BMPs
  - o General construction stormwater permit requirements (state or federal)
- ✓ Are training sessions held in cooperation with other local permittees or regional authorities?

TIP:

Permittees must train their primary inspectors, but they should also provide at least basic stormwater training to other field inspectors not directly involved in the stormwater program, such as building inspectors and code compliance staff. At a minimum, this will encourage these staff to refer stormwater problems to the permittee's designated stormwater inspector.

PUBLIC CONSTRUCTION PROJECTS

- ✓ Do RFPs or contracts include language specifying stormwater requirements?
- ✓ Are inspection and maintenance requirements specified in the contract?
- ✓ What oversight does the permittee implement to ensure the contractor is implementing all requirements appropriately and adequately?
- ✓ What penalties are in place to require compliance from the permittee's contractors?

In-Field Program Evaluation Activities

In-field activities to evaluate the construction inspection program typically consist of accompanying one or more construction inspectors in the field as they conduct inspections. The construction inspector is to conduct the inspection; you are to strictly observe. Discourage construction inspectors from merely describing the inspection process. It is best to accompany more than one construction inspector, if possible, to see whether the permittee is providing adequate training to all inspectors.

TIP:

Let the inspector lead the inspection—just observe. Don't let the inspector "explain" how they would conduct the inspection—tell them to show you.

The main purpose of the field evaluation is to assess the permittee's construction inspection program—how knowledgeable the inspectors are about stormwater requirements and BMPs, how thorough of an inspection they conduct, and how they handle problems identified at construction sites. This assessment can sometimes be made after only one or two construction site inspections, while for other permittees it may take multiple inspections and visits with several inspectors to assess their inspection program. Try to limit the number of people that join each inspection—too many staff can overwhelm a construction site, making it harder for the construction inspector to conduct an actual inspection.

Schedule at least a half-day for construction inspections. Travel time between sites may be significant, so plan accordingly. For a large permit area with a lot of active construction, schedule a full day if possible to visit both private and public projects. Stress the need to visit as many construction projects as possible while still following the inspector's standard procedures. Try to observe a large variety of sites, such as small residential projects, larger housing developments, commercial projects, and public construction projects, projects in mass grading, projects close to completion, and projects adjacent to waterways.

As the inspector conducts the construction inspection, observe the following:

- ✓ Is the inspector knowledgeable about stormwater BMPs, requirements, and ordinances?
- ✓ Is the inspector familiar with the applicable construction stormwater general permit?
- ✓ Does the inspector check the approved plans at the construction site? (Note that some inspectors visit sites frequently and this is not always practical. Also, plans at small construction sites might not be kept on-site.)
    - o Ask the inspector if he or she has visited this particular site before. If the answer is no, the inspector should ask to see the plans, have reviewed them ahead of time, or brought a copy so he or she knows what BMPs have been approved for that site.
- ✓ Does the inspector use a checklist or otherwise document inspection findings in the field?
- ✓ What kind of written feedback is provided to the operator and within what timeframe do violations need to be addressed?
- ✓ What kind of report is generated as a result of the inspection? Does it detail all problems found at the site or does it document only that the inspection occurred?
- ✓ Are findings from inspections tracked in a central location or database?

TIP:

Be aware that permittees will often match you up with their "best" inspectors and want to take you to the most compliant sites. Visiting sites that are "bad actors" or typically non-compliant can also be very helpful in characterizing the inspector's knowledge and abilities. "Dirty" projects do not necessarily indicate inadequate inspections or inept inspection staff. It is sometimes helpful to the inspectors to have another set of eyes at a problem site to assess the issues and provide insight for solutions.

- ✓ How does the inspector track required follow-up inspections or enforcement actions?
- ✓ Is the inspector thorough? Does the inspector walk the entire site and identify all potential problems?
- ✓ Does the inspector note flow pathways and check for discharges from the site at outfalls or to storm drain inlets?
- ✓ What type of stormwater training has the inspector received?

The in-field activity is a good opportunity for you to ask the inspectors some of the same questions asked during the office portion of the program evaluation to see if the answers differ. Often, inspectors are more open to discussing "problems" with the program than are the program managers. Try to spend some time with the construction inspector talking informally about the program. (The drive between inspections is a good time for this talk.)

Document all findings in the field in as much detail as possible. A Construction Inspection Worksheet has been included in Appendix C to assist in this documentation.

Common Issues Identified During Program Evaluations

The following are some common problems with construction programs. These areas should be closely considered during evaluations:

- ✓ When erosion and sediment control inspections are included as part of building inspections, erosion and sediment control is seen as a less important aspect of the inspection compared to other aspects, such as electrical or plumbing.
- ✓ The inspectors may lack the training and time necessary to conduct thorough erosion and sediment control inspections.
- ✓ Construction inspectors sometimes lack the authority to enforce the local ordinance.
- ✓ The inspectors may not follow a formal, written, escalating enforcement policy, or such a policy does not exist.
- ✓ Construction inspectors do not document inspection results using a checklist or other document.
- ✓ Inspectors do not conduct thorough inspections (i.e., drive-by inspections are common).
- ✓ Construction inspectors do not verify that BMPs approved on plans are actually installed at the project.
- ✓ Construction inspectors do not inspect to determine if BMPs are adequately maintained.
- ✓ The permittee is not adequately tracking inspections and inspection results.
- ✓ The permittee is not verifying general permit coverage before approving plans for construction disturbing one acre or more.
- ✓ Plan review staff lack adequate guidance and criteria for reviewing erosion and sediment control plans.
- ✓ Inspectors of public projects (in-house or contractual staff) are not knowledgeable about the applicable construction general permit (this is a significant liability because the inspector is usually responsible for ensuring compliance with this permit).

4.5 Post-Construction Controls

Regulatory Requirements

EPA's federal regulations for the stormwater Phase I and Phase II NPDES MS4 regulations are listed at right. NPDES MS4 permits must address these requirements and often include more specific requirements.

General Permits

As described above, stormwater Phase I and Phase II permittees must implement a SWMP that includes a post-construction component that addresses stormwater runoff at the completion of construction of new or redevelopment sites that disturb at least one acre.

Federal NPDES Regulations

NPDES MS4 permits must address these requirements and often include more specific state requirements:

- ✓ Phase I MS4 Regulations
  40 CFR 122.26(d)(2)(iv)(D)
- ✓ Phase II MS4 Regulations
  40 CFR 122.23(b)(5)
  40 CFR 122.23(b)(5)

Common Activities

Ordinance/Legal Authority

The ordinance should have language requiring that all new development and significant redevelopment projects incorporate stormwater management BMPs and submit a plan that complies with design standards, zoning codes and comprehensive or master plans. Some permittees review required construction general permit SWPPPs, while others require the development and submittal of a separate post-construction plan to address local stormwater requirements. In addition, some permittees require that projects smaller than one acre implement post-construction stormwater controls. These requirements should be detailed in an ordinance to establish legal authority. Ideally, the ordinance will outline the contents of an approvable plan and responsibilities for operation and maintenance of approved BMPs. The operation and maintenance section should also describe who is responsible for inspections and maintenance (e.g., the homeowner, homeowners' association, permittee, etc.).

Comprehensive or Master Planning

Often, when the MS4 is a municipality, the permittees address stormwater management using the established local comprehensive or master planning process. Comprehensive or master planning typically is required by state law and is to be used as guide in decision-making about the built and natural environment by the governing body of the permittee (i.e., city council, planning commission, county board). A comprehensive plan contains long-term planning recommendations for the community and often addresses water quality issues either directly with specific water quality goals or indirectly through the encouragement of land use practices that minimize impervious surface (i.e., high density "villages") or encourage open space.

Resources

- ✓ Menu of BMPs
  www.epa.gov/npdes/stormwater/menuofbmps
- ✓ California Stormwater Quality Association's New Development and Redevelopment Handbook
  http://www.cabmphandbooks.com/Development.asp
- ✓ Georgia Quality Growth Program
  www.georgiaqualitygrowth.com
- ✓ EPA Smart Growth Web site
  www.epa.gov/dced/
- ✓ Smart Growth Online
  www.smartgrowth.org/
- ✓ EPA Low Impact Development Resource Center
  www.epa.gov/owow/nps/lid/
- ✓ Low Impact Development Center
  www.lowimpactdevelopment.org

The inclusion of water quality-related goals in the comprehensive plan could assist local planners and policymakers to institutionalize the stormwater principles necessary to implement an effective SWMP.

However, the comprehensive plan is not a substitute for a SWMP Plan because it cannot be changed or updated readily and does not include necessary implementation details of the stormwater program.

Post-Construction BMP Standards

While the legal authority described above should require the installation of BMPs at sites, a permittee should also have additional specifications or guidance on what types of BMPs are expected or required. Ideally, the ordinance will include language that refers to a guidance manual for BMP design and implementation. The recommended manual should contain sizing criteria, performance criteria, and guidance on selection and location of BMPs. The manual and preferred BMPs should be available to project applicants early in the planning phase of a project. The standards should include guidance for proper district or subarea design (e.g., a redevelopment district), proper site design (e.g., sending gutter water into landscaping), source control (e.g., covering trash cans), and stormwater treatment BMPs (e.g., sand filters).

Plan Review and Approval Procedures

The review of post-construction plans should be based on formal review specifications, a checklist, or similar criteria. Plan review staff should document the BMPs considered, whether they were addressed on the plans, and any identified deficiencies. Some permittees use contract staff to review some or all plans. Be sure to review plans completed by contractual as well as permittee staff.

TIP:

Review several types of recent development projects that have gone through the review process. Include small residential and large commercial development projects as well as both new development and redevelopment projects, if applicable.

Post-Construction BMP Inventory

The permittee should maintain inventory detailing the types and locations of planned and installed post-construction BMPs projects. There may be two types of inventories: (1) a traditional database for site-level structural BMPs, and (2) a tracking system for planning or development practices BMPs. Ideally, both types of information would be managed in a database and linked to a GIS for optimum tracking. Structural post-construction BMPs must be inspected and maintained to remain effective. Tracking the locations, conditions, ages of the structural BMPs as well as the inspection findings is critical to ensuring the proper maintenance occurs for the life of the BMP. For planning-related BMPs, tracking systems may be linked to code revisions or development permits. Note that some revisions may occur with State or regional codes or standards, which might require a separate tracking system.

BMP Inspection and Maintenance

Proper BMP installation, operation, and maintenance are critical to optimizing the effectiveness of post-construction BMPs. If BMPs are not maintained, they can become concentrated sources of pollutants themselves. Comprehensive “as built” inspections are necessary at the conclusion of a project to ensure the BMP has been built properly and regular inspections are critical to ensure the BMP is being maintained as needed. Permittees may inspect private BMPs or require that the owners/operators of the facility inspect them through maintenance agreements or other mechanisms. Often, permittees require that facility owner/operators submit documentation detailing inspection dates and maintenance performed.

Enforcement

Legal authority is needed to require owner/operators to maintain BMPs. This can be outlined in a maintenance agreement or other binding contract, but it must be included in municipal code or regulation as well. The permittee should have available enforcement actions to require the owner/operator to perform necessary inspections and maintenance. Some permittees have authority to abate problem facilities (i.e., maintain the facility and charge the owner/operator) if necessary.

Public Construction Projects

Municipal permittees must apply the same local requirements to public construction projects as is required of private projects. Some municipal permittees develop and design public construction projects in-house without direct involvement from the department that reviews most private construction projects; therefore, it is important that the public project designers are trained and proficient in stormwater BMPs as well. If the permittee hires outside designers for public projects, stormwater guidelines should be provided to them to ensure compliance with local and general permit requirements. Permittees should have an inventory of publicly owned stormwater management and treatment facilities and should have an inspection and maintenance program established.

Training and Education

Permittees should provide training to plan review and BMP inspection staff (if applicable). This training should include classroom presentations and in-field training as well as follow-up evaluations to demonstrate that the training was effective.

TIP:

A review of existing codes and land development regulations can be extensive. The following are previous efforts to evaluate development codes that may be helpful in this process:

Center for Watershed Protection Codes and Ordinances worksheet http://www.cwp.org/COW_worksheet.htm

EPA list of smart growth scorecards www.epa.gov/smartgrowth/scorecards/project.htm

King County Washington "Built Green" Checklists http://www.builtgreen.net/checklists.html

Evaluating Post-Construction Programs

Development can significantly alter landscapes by increasing imperviousness (e.g., roofs, driveways, parking lots) and changing drainage patterns, thereby increasing the volume and velocity of runoff from the site. Increased volume leads to degradation of receiving waters and increased flood frequency. Stormwater from newly developed impervious areas can also contain a variety of pollutants that are detrimental to water quality, such as sediment, nutrients, road salts, heavy metals, pathogenic bacteria, and petroleum hydrocarbons. Two groups of BMPs can minimize the impacts of stormwater from new development and redevelopment projects: nonstructural site design or source control measures, which prevent or reduce the generation of pollutants, and structural treatment BMPs that detain and treat stormwater to control the volume of runoff and reduce pollutant loading to receiving waters.

Postconstruction stormwater impacts are not likely to be controlled entirely with site-level BMPs. Thus regional, district and subarea planning is increasingly recognized as a means to control overall imperviousness. Postconstruction BMP standards are likely to include many interlinking requirements that affect common land development practices, such as street design, community layout, and land use mix. The aim of such standards is to revise building practices that drive impervious surface generation within a watershed to reduce the effects of the built environment at a meaningful scale. Note that this approach to stormwater management is new, so an evaluation of this area may address future planning activities in addition to current activities.

There are several approaches permittees may use to implement planning-level BMPs, each of which is are appropriate in different development settings and offers a unique set of benefits. Four of these approaches or frameworks—redevelopment, infill, compact design, and conservation development—are described below and may be found in a comprehensive plan or SWMP:

- *Redevelopment*: Under this framework, a permittee is looking to redevelop already impervious districts and lots. Programs to support redevelopment include downtown redevelopment plans, vacant property reforms, brownfields redevelopment, and corridor redevelopment plans. These programs are typically more successful when supported by financial programs (e.g., tax incentives and grants), policy support (e.g., priority infrastructure), and technical assistance and staffing support.

- *Infill*: Infill development, like redevelopment, takes place in areas supported by existing road, water, and sewer infrastructure. Infill development tends to have a smaller footprint than conventional new development projects. Infill sites, whether individual lots or larger parcels, are generally undeveloped and may be able to manage stormwater flows onsite. The policies described above for redevelopment would apply to infill development, as well as any policies to mitigate flows from infill.

- *Compact Design*: Compact designs seek to meet development needs on a smaller footprint to achieve both development and conservation goals. These designs can be used in redevelopment (e.g., transit-oriented development) or new development (e.g., cluster housing or rural or urban villages) situations and are suitable in urban, urbanizing, and rural settings. The key to successful designs lies in coordinating interlinking aspects of transportation, land use, and open spaces. This framework is particularly amenable to design guidelines for a district, including stormwater management.

- *Conservation Development*: This framework, typically used in rural areas or along the urbanizing fringe, is targeted for the lowest impact development. Successful programs will be tied to specific conservation objectives (e.g., habitat preservation, groundwater recharge) and will link the rural development scheme with rural economic development objectives.

TIP:

When permittees review development codes to identify areas where stormwater benefits can be incorporated, the following are typically examined:

- ✓ Review of parking demand or indications of overly high parking ratios
- ✓ Overlarge setbacks from the street or other lot lines
- ✓ Minimum lot size requirements in urbanizing areas
- ✓ Highly separated uses embedded in codes
- ✓ Subdivision and street requirements
- ✓ A review of barriers to low impact development, redevelopment or other land efficient forms, including State or institutional barriers and standards

When evaluating the post-construction, new and redevelopment component of a SWMP, it is helpful to discuss the process chronologically in the order that a project would occur. Ask the permittee's planning staff to walk you through the process as if you were a developer proposing a project. Discuss what post-construction stormwater BMPs are required for new and redevelopment projects, how and when developers are informed of the stormwater requirements in the initial planning stages, how plans are reviewed for stormwater standards, on what legal authority requirements and standards are based, what is required for plan approval, how the BMPs are inspected during and after construction, and how the permittee ensures that BMPs are adequately operated and maintained.

Typically, an on-site evaluation for post-construction BMPs will involve interviewing planning and engineering staff. Planners usually work with developers to determine what is required for plan submittal, but engineering staff may actually review the plans and verify design calculations.

Before the Program Evaluation

To prepare for the post-construction program evaluation, you should review or obtain the following information:

- **NPDES MS4 permit provisions.** Review the permit requirements for the post-construction program to identify any specific requirements (such as a design standard for post-construction controls). The NPDES permit will serve as the primary basis for the program evaluation.

Pre-Evaluation Checklist

- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report
- ✓ Comprehensive plans
- ✓ Economic development plans

- **SWMP provisions.** The permittee's SWMP planning document(s) will describe the activities and BMPs the permittee has committed to implement and include measurable goals that provide deadlines for program implementation.
- **Latest annual report.** The annual report should be reviewed to identify past activities and help the inspector become familiar with the permittee's program.

Records Review

The following records might help in evaluating the compliance and performance of the permittee's post-construction program. Ask for copies of relevant information where it will help in writing a report or documenting a permit violation.

Documentation	What to Look For
Local ordinances	One or more of the following ordinances may be used by a permittee to regulate post-construction BMPs ▪ Grading ordinance ▪ Stormwater ordinance ▪ Landscaping ordinance ▪ Other portions of the code used by code enforcement staff to enforce aesthetic concerns ▪ Zoning codes or land development regulations (where the permittee chooses to amend existing codes to implement post-construction improvements) ▪ Economic development and capital improvement plans that support the district or comprehensive planning goals ▪ Design guidelines for larger development areas (e.g. subdivisions, mixed use districts, downtown redevelopment programs) ▪ Local and district open space and park plans that serve to support the post-construction program
Comprehensive or General Plans	Review for language that requires consideration of water quality concerns when evaluating development projects
Design standards, BMP manuals, or fact sheets	These can be state or local standards or be taken from a non-regulatory source
Post-construction plans reviewed and approved by the permittee	Where possible, try to review the plans for projects that you will also visit during the field portion of the evaluation
Post-construction BMP tracking system	Database or other system used to track the location of post-construction BMPs that have been installed and the maintenance performed or required for each BMP

Elements to Address During the Program Evaluation

Although not specified in detail in NPDES regulations, a successful post-construction program will generally be composed of the following elements:

- Ordinance/legal authority
- Comprehensive or master planning
- Post-construction BMP standards

- Plan Review and approval procedures
- Post-construction BMP inventory
- BMP inspections
- Enforcement
- Public construction projects
- Training and education

The common program elements are the key issues to consider during the review. For each of the elements listed above, this Guidance presents common program activities and questions to consider during the program evaluation. The questions are suggested for you to address each program component. Of course, a comprehensive program evaluation must be tailored to the specific issues associated with each permittee and should include more specific questions regarding the permittee's permit structure and management challenges.

ORDINANCE/LEGAL AUTHORITY

- ✓ What legal authority does the permittee have to require post-construction BMPs on development sites and to ensure maintenance?
- ✓ Does the permittee's legal authority address post-construction requirements for all projects disturbing one acre or more?
- ✓ Does the legal authority require site design, source control, and stormwater treatment BMPs?
- ✓ What exemptions does the ordinance or other legal authority allow?
- ✓ What procedures for alternative compliance (i.e., planning-level BMPs and other non-structural controls) are allowed?
- ✓ Does the legal authority authorize the permittee to require stormwater management plans to address post-construction impacts?

COMPREHENSIVE OR MASTER PLANNING

- ✓ Does the comprehensive or master plan include elements encouraging the control of water quality or quantity (e.g., flooding) from existing or new developments?
- ✓ Does the plan include elements to encourage protection of natural features (such as wetlands, buffer strips, etc.)?
- ✓ Does the comprehensive or master plan include elements to encourage minimization of impervious surfaces?
- ✓ Does the comprehensive plan include elements to encourage open space?

POST-CONSTRUCTION BMP STANDARDS

- ✓ What technical guidance (e.g., BMP manual) does the permittee use as the standard for design and selection of post-construction BMPs? It is not necessary to do a thorough review of the manual or standards used by the permittee. Question the planners regarding the following key items:
    - o Are project proponents required to follow the technical manual?

- Does the guidance provide siting and use criteria for the BMPs to ensure proper and adequate BMPs are being selected and implemented?
- Does the guidance provide siting and use criteria for BMP selection based on the development context (i.e., BMP selection appropriate for ultra urban-areas versus those more appropriate for more rural settings with larger parcels)?
- Are pollutants of concern that are typically generated by the proposed development type considered when selecting or approving BMPs?
- Does the technical manual provide guidance on sizing, performance, and location of BMPs?
- When was the BMP manual last updated?

✓ Does the permittee have different requirements or standards for different types of developments (e.g., specific post-construction requirements for gas stations or automobile repair facilities)?

✓ Does the permittee have design manuals related to land-efficient site designs (e.g. better site design, better models for large retailers)?

✓ Does the permittee promote source control and site design standards to reduce the generation of pollutants in addition to treatment BMPs?

✓ Does the permittee include in standards and manuals specifications for innovative site design practices, such as low-impact development and other techniques that manage runoff on-site?

✓ Are project applicants encouraged or required to use vegetative BMPs that promote infiltration, such as swales, biofiltration practices, etc., where possible?

✓ Does the permittee offer financial incentives to support post-construction stormwater goals (e.g., programs to support redevelopment, such as enterprise zones, or stormwater utility credits)?

TIP:

Select 2 to 3 approved projects with post-construction BMPs to review with the permittee. Try to choose different project types (residential, commercial) and sizes. Also review at least one public project plan to see if the permittee is applying adequate standards to municipal developments.

PLAN REVIEW AND APPROVAL PROCEDURES

✓ What is the project size threshold for the permittee to require post-construction BMPs?

✓ Does the permittee apply standard conditions that incorporate post-construction installation and maintenance requirements into its plan review process?

- Obtain a copy of the standard conditions. Do they specifically address post-construction stormwater management?

✓ Do plan reviewers use specific criteria or a checklist when reviewing plans?

✓ Does the permittee consider pollutants of concern or whether the project discharges to a 303(d) listed impaired water when determining which BMPs are required?

✓ Does the permittee consider such regional concerns as smart growth initiatives, watershed master plans, and other larger-scale planning efforts to ensure that each new development and redevelopment plan is consistent with the goals of these initiatives?

✓ When reviewing plans approved by the permittee:

- Look for whether adequate BMPs are included on plans, details, and drawings, what types of standard conditions or notes are included, whether maintenance requirements are specified, and whether the location of BMPs would hinder maintenance.
- Look for BMPs that may not be easily characterized, in particular the comprehensive planning and land-efficient planning BMPs.
- For commercial/industrial projects, review whether adequate source control BMPs are required on plans.
- Were comments provided by the permittee to the project proponent reasonable and appropriate?

✓ What types of projects must be reviewed by the permittee for post-construction stormwater controls? Does the permittee have a process to identify priority projects identified in the MS4 NPDES permit?

✓ What types of standards or technical guidance do the permittee's reviewers use to review projects?

✓ Does the permittee condition improvements to existing developments with requirements for post-construction stormwater controls? How are these redevelopment requirements triggered?

POST-CONSTRUCTION BMP INVENTORY

✓ How does the permittee track the installation and maintenance of post-construction BMPs?

✓ What information is collected?

- Location
- Owner/operator
- Recommended maintenance schedule
- Inspection findings

BMP INSPECTION AND MAINTENANCE

✓ Does the permittee require maintenance agreements for all projects with post-construction BMPs?

✓ Are "as-built" inspections required at the conclusion of a development project?

- Do staff conduct these inspections or are they self-certified?

✓ Does the permittee inspect private facilities or require inspections by owner/operators?

✓ If the permittee performs the inspections, how often are they performed?

✓ If owner/operators are required to inspect and maintain their BMPs, how is this authorized? Through a MOU? Through conditions of approval? Through another type of agreement?

✓ How does the permittee ensure inspections are occurring?

- Does the permittee send reminder notices?
- Does the permittee require the owner/operator to submit inspection reports?

ENFORCEMENT

- ✓ How does the permittee require proper maintenance and repair after the inspection?
- ✓ What types of enforcement actions are provided by ordinance (e.g., notices of violation, abatement)?
- ✓ Is the permittee's enforcement authority limited (e.g., limits on the dollar amount of fines, inability to issue civil penalties)?

PUBLIC CONSTRUCTION PROJECTS

- ✓ Does the permittee use post-construction BMPs for public projects?
- ✓ Has the permittee instituted a pilot program to test and showcase innovative BMPs on public property or in public buildings?
- ✓ Are they tracking the location, inspection history, and condition of the BMPs?
- ✓ Who inspects them? How often?

TRAINING AND EDUCATION

Training for staff

- ✓ Are plan reviewers trained on post-construction BMPs and requirements?
- ✓ What type of training do staff performing "as built" and post-construction inspections receive?
- ✓ How often are the trainings conducted?
- ✓ How many staff have been trained?
- ✓ What type of training or education does the permittee provide to city-contracted developers and engineers on post-construction requirements?

Developer and plan designer education

- ✓ What types of educational materials have been developed and distributed to developers and designers regarding post-construction BMPs and application requirements?
- ✓ How are the materials distributed? At the permit desk? During inspections?
- ✓ What type of training does the permittee provide or advertise to local developers and designers?
    - o How often is this training conducted?
    - o How many developers and designers have been trained?
- ✓ Are they required to attend?

<u>In-Field Program Evaluation Activities</u>

In-field evaluation activities primarily focus on verifying that structural and source control BMPs approved by the permittee were installed and are being maintained properly in the field. Select several completed projects that were subject to post-construction requirements. Take along the approved plans so that the locations and types of BMPs can be verified.

Note whether BMPs are installed as designed or if BMPs have been modified or removed after the project has been completed. For example, trash storage areas could have been modified after installation, slopes might have become destabilized, or storm drain stenciling could have been removed or become illegible.

In addition, in-field evaluation activities should include inspections of publicly owned stormwater BMPs, such as detention basins, to verify that they are being adequately maintained.

Common Issues Identified During Program Evaluations

The following are some areas where past on-site evaluations have found problems in post-construction programs. These areas should be closely considered during evaluations:

- ✓ The plan review staff lack training on design requirements for development standards and conditioning of new development projects.
- ✓ The permittee lacks review criteria, checklists, or a formal plan review process to assist plan review staff in reviewing development projects.
- ✓ The permittee does not assess BMPs for effectiveness at more than one scale (e.g., at both the site and watershed scales).
- ✓ The permittee institutes blanket BMP requirements (i.e., those that apply to all projects) that do not take into account the development setting.
- ✓ The permittee institutes BMP requirements that act as unintended barriers to better models for development and redevelopment.
- ✓ The permittee developed its program from a "Menu of BMPs" that has resulted in BMPs that are easy to administer but are not the most effective or do not address target stressors.
- ✓ The permittee does not consistently condition plans with post-construction stormwater controls.
- ✓ The permittee does not require inspection and maintenance of post-construction controls.
- ✓ The permittee lacks a system to track approved structural and source control BMPs for inspections and ongoing maintenance.
- ✓ The permittee's BMP tracking system is based on conventional, structural measures that are more readily quantified than non-structural techniques that work on a watershed basis, such as comprehensive planning or improved street designs.
- ✓ The permittee has not updated approved BMP lists to reflect advances in low impact development or comprehensive planning-related BMPs.

4.6 Industrial/Commercial Facilities

Regulatory Requirements

Applicable federal regulations for the NPDES stormwater Phase I and Phase II MS4 regulations are listed at right. NPDES MS4 permits must address these requirements and often include more specific state requirements. This program area is mainly applicable to Phase I MS4 permittees; Phase II MS4 permittees address stormwater discharges from industrial facilities and commercial businesses as part of their education programs.

Federal Regulations

NPDES MS4 permits must address these requirements and often include more specific state requirements:

- ✓ Phase I MS4 Regulations
  - 40 CFR 122.26(d)(2)(iv)(C)
  - 40 CFR 122.26(d)(2)(i)(A)
  - 40 CFR 122.26(d)(2)(ii)
- ✓ Phase II MS4 Regulations
  - 40 CFR 122.34(b)(ii)

General Permits

To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component. Operators of industrial facilities included in one of the 11 categories of stormwater discharges associated with industrial activity that discharge or have the potential to discharge stormwater to an MS4 or directly to waters of the United States require authorization under an NPDES industrial stormwater permit. Construction activity is one of these 11 categories, but because of the nature of construction stormwater controls, the category is discussed separately from the other 10 categories. Most states are authorized to implement the NPDES stormwater permitting program. EPA remains the permitting authority in several states and territories, on Indian Country lands, and at some federal facilities.

Resources

- ✓ EPA Menu of BMPs www.epa.gov/npdes/stormwater/menuobmps
- ✓ Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices www.epa.gov/npdes/pubs/contents_indguide.pdf
- ✓ Sacramento County Industrial Stormwater Compliance Program www.sactostormwater.org/industrial/compliance.asp
- ✓ Multi-Sector General Permit www.epa.gov/npdes/msgp

For those areas where EPA is the permitting authority, the **Multi-Sector General Permit (MSGP)** provides facility-specific requirements for many types of industrial facilities with a single permit. The permit outlines steps that facility operators must take prior to being eligible for permit coverage, including development and implementation of a SWPPP.

It is important to note that some permittees will also have coverage under industrial stormwater general permits or have individual permits for maintenance facilities that fall under one of the covered industrial categories, such as landfills, waste transfer stations, or transportation facilities. Please refer to the "MS4 Maintenance Activities" section of Conducting an Evaluation for information regarding municipal facilities that may also require industrial stormwater permit coverage.

Common Activities

The industrial and commercial facilities program component can be implemented by various departments and staff. Many municipal permittees use existing pretreatment and restaurant inspectors to fulfill the stormwater requirements. Some permittees choose to hire outside consultants to perform inspections and maintain the inventory of facilities.

Legal Authority

Many municipal permittees have adopted stormwater ordinances that outline general or specific discharge prohibitions that apply to industrial and commercial properties. These ordinances should list discharge exemptions, inspection requirements, and penalties for non-compliance. Some permittees, however, must

rely on multiple existing codes (i.e., health, building, hazardous materials) designed to protect health and human safety. In these cases, the program coordinator and inspection staff should be able to articulate the combination of codes that provide the authority to inspect, prohibit, or stop illegal discharges, require BMPs, and enforce instances of noncompliance.

Facility Inventory

The types of industrial and commercial facilities that a permittee needs to inspect can vary significantly from permittee to permittee. Some localities may have large industrial areas with few commercial businesses, while others may have a large number of restaurants and retail businesses but no industrial facilities at all. Still other permittees may have a mix of many different types of industrial and commercial facilities. Permittees should characterize the facilities and prioritize them based on their potential impact on stormwater quality, and the inspection program should be based on this prioritization approach.

Many permittees have developed a database to inventory industrial/commercial facilities and manage the inspection program. The inventory can be created using multiple resources, such as the permitting authority's list of facilities that are covered under the state industrial general permit, business licenses, list of pretreatment significant industrial users, and phone books or other professional directories. As per the federal regulations, the inventory should be organized by watershed with a description (such as standard industrial classification (SIC) codes) that "best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, stormwater associated with industrial activity." The database inventory should include facility type, past inspection or enforcement results, proximity to receiving waters, potential pollutant sources on-site, and other pertinent information to assist in inspection prioritization and management. Many permittees use the same database to manage the construction inspection program as well.

Standards, BMPs, and Outreach

Many municipal permittees have stormwater ordinances that include specific BMPs or standards for industrial and commercial facilities to protect water quality and minimize stormwater pollution. Others have adopted pollution prevention standards for new or redevelopment of industrial/commercial facilities that are required through conditions of approval, improvement permits, etc. Phase I MS4 permittees have developed brochures, fact sheets, and posters to hand out to operators during inspections to educate them about appropriate BMPs. Many permittees have developed these materials in multiple languages to use in a variety of communities. Some permittees have Web sites with links to relevant outside resources for more information. Many permittees also acknowledge that educating facility operators is essential to implementing BMPs and minimizing stormwater pollution and should be done, not only during inspections, but also through workshops, conferences, and professional meetings.

Staff Training

To ensure that inspectors are knowledgeable and proficient in the newest and most effective approaches to minimizing stormwater pollution from industrial/commercial facilities, many permittees require annual BMP training for inspection staff. This training may be presented in-house or staff may attend trainings provided by the permitting authority or industry. It is important to cross-train any other staff (e.g., pretreatment, health department) used for stormwater inspections as well.

Inspections

Most effective industrial/commercial inspection programs maintain a complete facility inventory and group them according to priorities established by the permittee. An inspection frequency is determined based on priority, and a database is used to manage such information as inspection findings, enforcement actions, and required follow-up activities. Many permittees use and cross-train existing staff to perform industrial/commercial inspections, but some permittees may need to maintain an exclusive stormwater inspector due to a potentially large number of high-priority facilities. There should be an inspection

standard operating procedure that has been formalized and documented. It should include a checklist to be used during the inspection and possibly a report format. Inspectors should be aware of federal, state, and local stormwater regulations that may apply to industrial/commercial facilities. Inspectors should be familiar with various types of BMPs commonly used at the types of facilities typically found in the permit area and should be able to educate facility operators about such BMPs. In addition, inspectors should understand and use the permittee's established enforcement escalation response plan to gain compliance as necessary. The inspection staff should be proficient in the enforcement escalation procedure and should properly document all enforcement actions accordingly. Inspections should be used not only to identify non-compliance issues, but as an opportunity to educate facility operators about proper stormwater BMPs.

Program Support and Resources

Permittees should have an established source of funding for their industrial/commercial facilities program, including adequate resources for frequent inspections. Funds can come from fees paid by the business owners. If general funds are used to support the program, permittees should ensure that industrial and commercial inspections are line-item appropriations not subject to reduction or elimination based on board politics or budget constraints.

Enforcement

The ordinance establishing legal authority for the industrial/commercial inspection component of the SMWP should define all stormwater discharge prohibitions, describe any exemptions or waivers, detail the enforcement escalation procedure, and outline any fines or other penalties for noncompliance. Inspectors should have the ability to levy a penalty such as a compliance directive, notice of violation (NOV), or administrative fine to the facility during an inspection if non-compliance is noted. Significant fines or penalties should be included in the ordinance for egregious violations or recidivism.

Evaluating Industrial/Commercial Inspection Programs

The evaluation of an industrial/commercial inspection program focuses on the permittee's legal authority to require and enforce their program, prioritization of facilities, and in-field inspection procedures. The evaluation should begin with a thorough review of the permittee's ordinances, standards, guidance, and other relevant written materials.

Before the Program Evaluation

To prepare for the industrial/commercial inspection program evaluation, you should review or obtain the following information prior to the evaluation:

Pre-Evaluation Checklist
- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report
- ✓ List of NPDES facilities
- ✓ Inspection reports

- **MS4 NPDES permit provisions.** Review the permit requirements for the industrial/commercial inspection program to identify any specific requirements (such as a minimum inspection frequency). The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP planning document(s) will describe the activities and BMPs the permittee has committed to implement and may include measurable goals that provide deadlines for program implementation.
- **Latest annual report.** The most recent annual report should be reviewed to identify past activities and help you become familiar with the permittee's program.
- **List of NPDES industrial facilities.** Try to obtain a list of industrial facilities in the permit area that are covered under an industrial stormwater general permit issued by the permitting authority or are included in the pretreatment program of local or regional POTWs. This list can be used during the program evaluation to determine whether the permittee is including these facilities in

the inspection program and to understand the types of facilities that are found in the permit area. The list can also help identify potential sites for field inspections. The list can also be crosschecked with a similar list requested and obtained from the permittee.

- **Industrial inspection reports.** Review reports from inspections performed by the permitting authority and talk to state or EPA inspectors to determine if there have been past industrial stormwater violations at facilities located in the permit area.

Records Review

During the evaluation, you should ask for copies of relevant information to assist in writing the report or documenting a permit violation. The following records might help in evaluating the compliance and performance of the permittee's industrial/commercial inspection program.

Documentation	What to Look For
Local ordinances, regulations, or policies that might apply to industrial/commercial facilities	▪ Stormwater ordinance ▪ Health codes ▪ Municipal code sections dealing with aesthetics; vehicles; dumpsters, trash, solid waste; and litter, trash, sweeping ▪ Building codes
Enforcement escalation procedure or response plan	Flow chart or procedure that specifies a process by which fines can be levied and legal action taken against facility operators or business owners who violate stormwater rules and ordinances
Tracking system	Database or other system used to track the following information: ▪ The number and type of industrial facilities in the permit area ▪ Prioritization scheme or other method that determines inspection schedule and frequency ▪ The number, frequency, and results, along with follow-up actions resulting from inspections ▪ The number and type of enforcement actions at facilities
Examples of inspection reports	▪ Hand-written field notes and formal write-ups if both are used
Examples of enforcement files or cases	▪ Records should document enforcement and follow-up activities ▪ Review both a completed file and one that is in progress if possible
Training	▪ Review any records documenting how often training has been provided to municipal inspectors, who prepared and delivered the training, who attended, and how long the training lasted, as well as any examples of the training materials used ▪ Educational information, brochures, or other BMP guidance used by staff or distributed to facility operators

Elements to Address During a Phase I MS4 Program Evaluation

Although not specified in detail in the NPDES Phase I MS4 regulations, a successful industrial/commercial inspection program will generally be composed of the following elements:

- Legal authority
- Facility inventory/prioritization
- Standards, BMPs, and outreach
- Staff training
- Facility inspections
- Program support and resources
- Enforcement/referrals

The common program elements are the key issues to consider during the review.

LEGAL AUTHORITY

- ✓ Does the Phase I permittee have the authority to require industrial and commercial facilities to implement stormwater BMPs? Does the Phase I permittee have the authority to conduct inspections and enforce requirements?
    - o What ordinance(s), code, or policy provides this legal authority?
- ✓ What types of facilities are covered under this legal authority?
- ✓ Who (e.g., specific staff, department, etc.) has the authority to enforce the ordinances and/or inspect the facilities?
- ✓ What exemptions does the ordinance or other legal authority allow?

FACILITY INVENTORY

- ✓ Has the permittee completed an inventory of industrial/commercial facilities discharging to the stormwater system?
- ✓ What types of facilities are included on the inventory?
- ✓ What sources were used to create the inventory?
    - o Facilities that filed NOIs for EPA MSGP or state industrial general permit coverage?
    - o Significant industrial users within the pretreatment program?
    - o Business licenses?
    - o Phone book?
    - o "Windshield" survey?
- ✓ Does the inventory include all the industrial/commercial facilities subject to the industrial general permit?
    - o Does the permittee periodically check to see if new facilities that must be covered by an industrial stormwater general permit have filed an NOI?
    - o What is the process for notifying the permitting authority of non-filers?
- ✓ If applicable, does the inventory include all the facilities specified as required in the MS4 NPDES permit?
- ✓ How is the inventory updated? How often?

- ✓ What information is maintained about the facilities?
- ✓ How is the inventory maintained and stored?
- ✓ Does the permittee prioritize the facilities?
- ✓ Is the prioritization based on facility type, past inspection or enforcement results, proximity to receiving waters, potential pollutant sources on-site, and so forth?
- ✓ Is the prioritization used to determine frequency of inspections?
- ✓ Has the permittee mapped the locations of prioritized facilities to cross-reference reports of dumping, illicit discharges, or other water quality issues?

STANDARDS, BMPS, AND OUTREACH

- ✓ Has the permittee adopted standards or BMPs that industrial/commercial facilities are required to implement (e.g., all car dealerships must install a wash rack plumbed to the sanitary sewer)?
- ✓ Are the requirements for new developments only or are they triggered by improvements of existing facilities? Are there schedules for implementing retrofits?
- ✓ Are these standards applicable to existing facilities, new facilities, or both?
- ✓ Does the permittee refer facility operators to specific stormwater BMP or standards guidance documents?
- ✓ What type of educational program has been developed for industrial and commercial facility operators?
- ✓ What type of brochures, handouts, or guidance on BMPs is provided to these facilities by the permittee?
- ✓ When is this information provided? During inspections? During training events? During professional organization presentations?

STAFF TRAINING

- ✓ What type of training do the industrial and commercial inspectors receive?
- ✓ How often?
- ✓ If additional inspectors are used (e.g., food safety inspectors for restaurant inspections, pretreatment inspectors), are they trained specifically on stormwater BMPs and requirements? By whom?

INSPECTIONS

- ✓ Who performs inspections and for what types of facilities (e.g., health inspectors for restaurants, pretreatment inspectors for industrial facilities with a pretreatment permit)
- ✓ How often are industrial and commercial facilities inspected?
  - o How is the frequency determined?
- ✓ Does the permittee's industrial/commercial inspector(s) use a standard checklist during inspections?

TIP:
It is a good idea to ride with the inspector during the in-field portion of the evaluation. This is a good time to talk informally about the any program, staffing, and noncompliance issues.

- ✓ Is a report written after the inspection? How is the inspection documented in the file?
- ✓ Does the permittee verify NPDES permit coverage for facilities?
- ✓ For industrial facilities, does the inspector review the SWPPP and monitoring data during the inspection?
- ✓ Does the permittee refer non-filers to the permitting authority?
- ✓ Do inspectors provide educational materials during inspections? What types?
- ✓ If multiple departments or agencies perform inspections, how is information transferred or cataloged?

PROGRAM SUPPORT AND RESOURCES

- ✓ Does the program have a dedicated source of funding to support inspectors?

ENFORCEMENT

- ✓ In instances of noncompliance, do the inspection staff use a formalized, approved enforcement escalation procedure?
- ✓ How was the enforcement escalation procedure developed? Is it used? Is it effective?
- ✓ Who is authorized to apply various enforcement procedures (e.g., NOVs, fines)?
- ✓ What types of penalties are readily available to the inspection staff?
- ✓ What is the most common method of gaining compliance (e.g., NOVs, fines, abatement)?
- ✓ Have the permittee describe a recent non-compliance issue at an industrial/commercial facility to assess how compliance was achieved.
- ✓ At what point are non-compliance cases referred to the NPDES permitting authority? How many have been referred in the last 12 months?

In-Field Phase I Program Evaluation Activities

To determine whether the permittee is adequately inspecting for compliance at industrial/commercial facilities, it is necessary to observe the inspectors "in action." Discourage inspectors from merely describing the inspection process; you need to observe an actual inspection in process.

Schedule at least a half-day for this in-field activity being sure to allow enough time for travel between facilities. If the permittee is conducting both commercial and industrial inspections, try to observe inspections at each type of facility. If the permittee has more than one inspector, accompany a different inspector at each type of facility. In general, small, less complex facilities are better to visit than large industrial facilities. Work with the permittee to select typical facilities. For example, if the vast majority of facilities are vehicle maintenance facilities, visit several of those. It should be made clear that the inspectors are to conduct the inspections; you are only to observe.

Try to limit the number of people that attend each inspection. Too many staff can overwhelm a small facility, making it harder for the inspector to conduct a representative inspection. Discuss which facilities are to be inspected early in the evaluation process. This will allow enough time to schedule inspection staff and arrange transportation logistics.

Many times, inspectors do not participate in the office evaluation, so the in-field activity is a good opportunity to ask the same questions to see if the answers are consistent. Also, many inspectors are more open to discussing "problems" with the program than are stormwater program managers. Try to spend some time with the municipal inspector talking informally about the program.

First and foremost, during a site visit the municipal inspector should be able to determine whether illegal discharges are occurring or could be imminent from industrial/commercial facilities. Visiting a site during a rain event is optimal to observe potential issues. In the event that the inspector does feel immediate action is necessary, it is important that the inspector either have the legal authority to cease discharges and require immediate BMPs, or be aware of who does have this ability and under what legal authority. The inspector should be aware of all applicable ordinances, as well as administrative, civil, and criminal recourse in the event of non-compliance. The inspector should be aware of the enforcement escalation procedure or plan as well.

As the inspector conducts the industrial or commercial inspection, observe the following:

- ✓ Is the inspector knowledgeable about stormwater BMPs, requirements, and ordinances?
- ✓ Is the inspector familiar with the applicable industrial stormwater general permit (state or federal)?
- ✓ When inspecting an industrial facility, does the inspector check whether the facility has a waste discharge identification number, and does the inspector review the facility's SWPPP?

TIP:

It is a good practice to visit at least one facility with historic or existing compliance issues. This can be an excellent way to demonstrate how effective the inspection and enforcement program is, and often the inspector will welcome outside assistance and advice.

- ✓ Does the inspector use a checklist or otherwise document inspection findings in the field?
- ✓ What kind of written feedback is provided to the operator and within what timeframe do violations need to be addressed?
- ✓ What kind of report is generated as a result of the inspection? Does it detail all problems found at the facility or does it document only that the inspection occurred?
- ✓ Are findings from inspections tracked in a central location or database?
- ✓ How does the inspector track follow-up inspections or enforcement actions?
- ✓ Is the inspector thorough? Does the inspector walk the entire site and identify all potential pollutant sources?
- ✓ Does the inspector note flow pathways and check for discharges from the facility at outfalls or to storm drain inlets?
- ✓ Is the inspector able to educate the facility manager on proper BMPs or requirements? What educational material is provided?

Document all findings in the field in as much detail as possible. An Industrial/Commercial Inspection Worksheet has been included as Appendix C to assist in this documentation.

Elements to Address During a Phase II MS4 Program Evaluation

- ✓ Has the permittee identified specific business sectors that might be a significant source of stormwater pollutants to the MS4?
- ✓ What type of educational program has been developed to address stormwater discharges from industrial facilities and commercial businesses?
- ✓ What type of brochures, handouts, or guidance on BMPs is provided to these businesses by the permittee?
- ✓ How is this information provided? As a result of complaints or illicit discharge incidents? During training events? During professional organization presentations?
- ✓ How does the permittee evaluate the effectiveness of education and outreach efforts in terms of measuring changes in stormwater management and pollution prevention practices at industrial facilities and commercial businesses?

Common Issues Identified During Program Evaluations

The following are some typical problem areas associated with the industrial/commercial SWMP component. These areas should be closely considered during evaluations:

- ✓ The permittee has yet to fully implement an inspection program for industrial and/or commercial facilities.
- ✓ The inventory of industrial/commercial facilities is not complete and is not regularly updated.
- ✓ Facilities have not been prioritized according to water quality threat.
- ✓ The permittee has not conducted outreach to facilities on the types of stormwater BMPs that should be implemented.
- ✓ Industrial/commercial inspectors have not been trained on stormwater BMPs and requirements.
- ✓ The permittee does not have a process to identify non-filers to the permitting authority.
- ✓ The permittee lacks written procedures and standards for conducting industrial/commercial inspections and for enforcement.
- ✓ The permittee cross-trains existing inspectors (e.g., pretreatment, food safety) to perform stormwater inspections but does not provide adequate time and resources to perform them.

4.7 Illicit Discharge Detection and Elimination

Regulatory Requirements

EPA's federal regulations for the stormwater Phase I and Phase II MS4 regulations are listed at right. NPDES MS4 permits must address these requirements and often include more specific requirements.

Federal Regulations

- ✓ Phase I MS4 Regulations 122.26(d)(2)(iv)(B)
- ✓ Phase II MS4 Regulations 40 CFR 122.34(b)(3)

Common Activities

Legal Authority

Permittees must develop and implement an effective program to prohibit illicit discharges from entering the MS4. The prohibition of illicit discharges should be linked to legal authority to ensure proper enforcement. This legal authority can be included in public health and safety regulations, specific stormwater regulations, sewer use bylaws, local ordinance, or a combination of several parts of the code.

Resources

- ✓ Menu of BMPs www.epa.gov/npdes/stormwater/menuofbmps
- ✓ Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments www.cwp.org/
- ✓ Illicit Discharge Detection and Elimination Manual www.neiwpcc.org/PDF_Docs/iddmanual.pdf

Mapping

Phase I MS4 permittees should have developed a map of known municipal outfalls discharging to waters of the United States as part of their source identification conducted for Part I of their NPDES application. Phase II permittees are required to develop a map of outfalls and the names of locations of all waters of the United States that receive discharges from those outfalls. To be useful, these maps should also include the storm drain pipe network and catch basin locations, along with other relevant information such as the location of stormwater treatment facilities, watershed boundaries for each outfall, critical land uses and pollutant sources, and municipal facilities. Outfalls and drainage areas should be prioritized in order of their potential to be a source of illicit discharges. Ideally, this information would be managed in a database linked to a GIS.

Field Screening

Field screening of outfalls during dry weather can help to identify illicit discharges in priority areas. Of particular concern are areas of older development, areas with a high concentration of automobile-related industries, and areas with high concentrations of industrial facilities among others. Documentation of the illicit discharge detection and elimination (IDDE) program component in the SWMP Plan should include a detailed summary of the departmental responsibility for field activities, frequency of inspections, inspection procedures, inspection equipment, and documentation procedures for field activities.

Investigation of Potential Illicit Discharges

Municipalities should have a written procedure for how they will locate, eliminate, and prevent illicit discharges to the MS4. The procedure should address both spills and illegal connections to the MS4 and should be available to all staff responsible for responding to illicit discharges. The procedure should also specify how spills and illicit discharge incidents are tracked.

Spill Response and Prevention

The purpose of spill response programs is to reduce the risk of spills and improve response and cleanup when they occur. These programs usually require coordination among fire, police, health, and public works departments. The departments responsible for implementing the program should be identified and the SMWP should address employee training, reporting procedures, spill containment, storage and

disposal activities, documentation, and follow-up procedures. For each of these elements, particular attention should be given to good housekeeping and materials management practices. Procedures can be implemented through modification of ordinances and enforcement or through coordination with existing spill prevention or spill containment programs. Most permittees address this element through the development of a spill response plan.

Public Awareness and Reporting Program

Permittees should promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges to the MS4 or receiving waters. Typical public awareness and reporting programs may include developing a hotline number, educating school students, using inserts in utility bills, and developing media announcements. Permittees should have a system in place to quickly route all public calls to appropriate staff, track the calls, and document response and enforcement, if used, for reporting purposes.

TIP:

IDDE public awareness efforts are often discussed during the evaluation of the public education and involvement program.

Proper Management of Used Oil and Toxics

Permittees should provide information on where the public can safely recycle or dispose of used oil and toxic materials to minimize illegal dumping.

Preventing Sanitary Sewer Discharges

Although not a specific requirement of Phase II programs, Phase I MS4 permittees are required to limit infiltration to the MS4 of seepage from municipal sanitary sewers. Many permittees have developed a sanitary sewer overflow program to address discharges from their sanitary sewers. Others have developed programs to promote proper maintenance of septic tanks.

TIP:

Maintenance field crews are usually the best "eyes and ears" available to the permittee to detect illicit discharges and illegal dumping activities. It is important that the information observed in the field is communicated the appropriate staff for follow up and outreach.

Education and Training

Training for staff should include spill response procedures and procedures on how to locate, eliminate, and prevent illicit discharges. Permittees should also educate the public on the hazards of illegal dumping and illicit discharges to the MS4.

Evaluating Illicit Discharge Detection and Elimination Programs

Common sources of illegal, non-stormwater discharges include sanitary wastewater, automobile maintenance waste products such as motor oil or antifreeze, laundry wastewater, household toxic substances, spills from car accidents, runoff from excess irrigation, and industrial sources of cooling waters, rinse water, and other process wastewater. Although these illicit discharges can enter the storm sewer system in various ways, they generally result from either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the storm drain system or spills). Illicit discharges can be further divided into those discharging continuously and those discharging intermittently.

Phase I NPDES MS4 regulations require that a program be developed to detect and remove illicit discharges into the storm sewer by prohibiting these discharges, field screening outfalls, investigating potential illicit discharges, controlling the infiltration of sanitary sewage into the storm sewer, and developing programs for spill response and prevention, public awareness and reporting, and used oil and toxics disposal.

Typically, staff charged with implementing the IDDE SWMP component are from multiple departments and agencies, although this varies from permittee to permittee. The primary responsibility for detecting and investigating illicit discharges normally falls to the public works department. Public works field crews are in the field every day and are the best source of information about what is happening in the permit area. Also, public works departments often have access to the maps and equipment necessary to track discharges to their source. Normally, public works field staff are not authorized to use enforcement against dischargers, so code enforcement staff may be necessary to investigate cases. Many permittees use the fire department for cleanup of spills, and sometimes police departments are charged with manning a "hotline" for complaints called in by citizens and for ultimately investigating dumping or other illegal activities.

Before the Program Evaluation

To prepare for the IDDE program evaluation, an evaluator should review or obtain the following information prior to the evaluation:

Pre-Evaluation Checklist
- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report

- **MS4 NPDES permit provisions.** Review the permit requirements for the IDDE program to identify any specific requirements, such as a proactive outfall screening. The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP planning document(s) will describe the activities and BMPs they have committed to implement and may include measurable goals that provide deadlines for program implementation.
- **Latest annual report.** The annual report should be reviewed to identify past activities and help you become familiar with the IDDE program.

Records Review

Consider reviewing the following records during the on-site evaluation to determine the permittee's capabilities and extent of implementation.

Documentation	What to Look For
Ordinance and policies	▪ Code which allows the permittee to prohibit illicit discharges from commercial, industrial, or residential sources ▪ Should include or reference an enforcement escalation policy
Enforcement escalation policy	▪ Should describe the process for eliminating the source of an illicit discharge and for obtaining recourse or abatement if necessary ▪ Should describe which staff are authorized to enforce the applicable ordinances and which enforcement mechanisms are available
Illicit discharge tracking records and databases	Database or other system used to track the following information: ▪ The number and type of illicit discharges located in the permit area ▪ Follow-up actions once discharges are located ▪ Locations of discharge incidents (e.g., on a map or in a GIS)

Documentation	What to Look For
Dry-weather monitoring or screening records	▪ Describes the location and description of dry weather flows ▪ Monitoring data associated with a discharge ▪ Information about the source of a discharge and actions take to identify sources
Spill Response Plan and records	▪ These records may be maintained by a different agency such as the fire department, but the permittee should have access to the information and be provided a regular report of spills that impact the MS4
Recycled oil and household hazardous waste educational materials	▪ These materials may be presented during the public outreach part of the evaluation
Web site or other educational materials for reporting illicit discharges and dumping	▪ Review educational materials to determine if the general public has adequate information to identify and report illicit discharges ▪ Materials should have a reporting number that is viable 24 hours a day
Training records	▪ Training records should be available to document that the permittee's employees are regularly trained on recognize an illicit discharge

Elements to Address During the Program Evaluation

The NPDES regulations specifically require the following elements in an IDDE program for both Phase I and Phase II programs:

- Legal authority
- Mapping
- Field screening
- Investigation of potential illicit discharges
- Spill response and prevention
- Public awareness and reporting program
- Proper management of used oil and toxics
- Preventing sanitary sewer discharges
- Education and training

The common program elements are the key issues to consider during the review. For each of the elements listed above, this Guidance presents common program activities and questions to consider during the program evaluation. The questions are suggested for you to address each program component. Of course, a comprehensive program evaluation must be tailored to the specific issues associated with each permittee and should include more specific questions regarding the permittee's permit structure and management challenges.

CHAPTER 4.7: ILLICIT DISCHARGE DETECTION AND ELIMINATION

LEGAL AUTHORITY

- ✓ Does the permittee have an ordinance to prohibit illicit discharges and dumping to the MS4?
- ✓ What exclusions are included in this ordinance?
- ✓ What enforcement mechanisms are authorized in the event of an illicit discharge being detected?
- ✓ Has an enforcement escalation plan been developed?

MAPPING

- ✓ Does the permittee have a map showing storm drain pipes, outfalls, and storm drain inlets?
- ✓ Is the map readily available to the personnel who would respond to an illicit discharge incident?
- ✓ Does the permittee have a map of the storm drain system showing the locations of outfalls and municipally maintained structural stormwater controls?

TIP:

The IDDE mapping and field screening discussion may need to be coordinated with the discussion of MS4 maintenance activities. Ideally, the maps developed for public agency activities and for IDDE would be the same because often public works field maintenance crews are involved with inspections of outfalls.

FIELD SCREENING

- ✓ How are field screening areas identified?
- ✓ Are areas of the MS4 prioritized based on incidents of illicit discharges, land use, dumping reports, etc.?
- ✓ How often are field screening areas evaluated?
- ✓ Are outfalls inspected during dry weather to identify any potential dry-weather discharges? What does the inspection include?
- ✓ If dry-weather flows are present, are they being sampled to determine potential sources of pollutants? For what parameters?
- ✓ Does the permittee have a database (or other method) to track locations of illicit discharges, spills, and illegal dumping?
- ✓ Does the database track dry-weather monitoring or screening data?

INVESTIGATION OF POTENTIAL ILLICIT DISCHARGES

- ✓ Does the permittee have a procedure for tracing the source of an active illicit discharge?
- ✓ Who performs the investigations?
- ✓ Are these procedures written in a document or plan?
- ✓ What equipment does the permittee use to find illicit discharges?
- ✓ Does the permittee have equipment to videotape storm drains, or can it quickly contract out this work?
- ✓ How are investigations tracked?
- ✓ Has an enforcement response plan been adopted for use when an illicit discharge source has been located?

- ✓ Review complete paperwork trails for several illicit discharge events (including a spill and an unknown illicit discharge in the storm drain system).
    - o Was the full investigation process documented?
    - o Are adequate enforcement actions taken when required?
- ✓ Does the permittee have the ability to collect cleanup and abatement costs from the responsible party?

SPILL RESPONSE AND PREVENTION

- ✓ Does the permittee have a clear set of procedures in place that details who is responsible for responding to spills and emergency situations?
- ✓ Do field staff have spill containment supplies in their vehicles, and are they trained to contain minor spills?
- ✓ Is a contractor or other entity available for larger spills?
- ✓ Does the permittee have the ability to collect cleanup and abatement costs from the responsible party?
- ✓ How are spills and spill response tracked to ensure adequate reporting?

PUBLIC AWARENESS AND REPORTING PROGRAM

- ✓ Does the permittee prioritize subwatersheds or neighborhoods and assign resources for educational efforts based on frequency and types of illicit discharge incidents?
- ✓ Is there a general phone number or "hotline" in the phone book or Web site that people can call to report a spill or dumping?
- ✓ What types of public outreach materials are available to publicize public reporting?
- ✓ Does the permittee track the number of public calls or complaints reporting illicit discharges?

PROPER MANAGEMENT OF USED OIL AND TOXICS

- ✓ Assess education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials such as household hazardous waste.
- ✓ Does the permittee have recycling or collection facilities to which the public can take used oil and other toxics?
- ✓ What type of toxics does the permittee manage recycling and disposal?

PREVENTING SANITARY SEWER DISCHARGES

- ✓ Has the permittee conducted any studies or evaluations to determine whether sanitary sewers are contributing pollutants to the MS4?
- ✓ What is the extent of infiltration and inflow into the sanitary sewer system? How is this impacting discharge from the MS4?
- ✓ If the permittee also operates a sanitary sewer system, do they have procedures to prevent sewage spills and SSOs to the MS4?

EDUCATION AND TRAINING

- ✓ What type of training do field staff (e.g., storm sewer maintenance crews, street sweepers) receive on spill response and IDDE?
- ✓ Are staff generally educated about what illicit discharges are and how to report them?

In-Field Program Evaluation Activities

IDDE activities can be difficult to evaluate in the field. If, during an on-site evaluation, the permittee receives a report of a potential illicit discharge, you could accompany the response staff (if allowed) to view their response procedures. Other in-field activities include viewing the equipment available for responding to illicit discharge events (e.g., response trucks, spill containment equipment, video equipment for investigating storm drains) and talking to field staff about their knowledge of and training in illicit discharge identification, reporting, and response.

Another field activity is observing the dry-weather screening program. Staff can take you to screening/sampling points to demonstrate the permittee's dry-weather sampling procedures. An Outfall Visual Inspection Worksheet has been included in Appendix C to assist in this field inspection.

Although field activities are somewhat subjective, during all field activities you should get a sense of whether the staff are aware of illicit discharges and proactive in identifying and addressing them. For example, if the industrial inspector observes obvious illicit discharges while driving to an inspection, does the inspector ignore these incidents or stop and report them?

Common Issues Identified During Program Evaluations

The following are some areas in which past on-site program evaluations have found problems with IDDE program components. Consider these activities as you conduct evaluations:

- ✓ IDDE programs are largely reactionary spill response programs and do not contain a proactive element to detect or prevent discharges.
- ✓ The permittee lacks adequate documented procedures for how to conduct illicit connection and illegal discharge investigations (e.g., the permittee does not have written procedures for tracking and identifying the source of a discharge).
- ✓ The permittee fails to conduct any dry-weather screening to identify illicit discharges.
- ✓ If a discharge is found, the permittee does not have specific criteria, which could include numeric criteria, to determine whether the discharge is illicit. In most cases, unless the discharge is obviously illicit (e.g., presence of discoloration, oil sheen), the permittee assumes the discharge is either irrigation runoff or groundwater and does not conduct further investigation of the quality or source of the discharge.
- ✓ Staff are not adequately trained on illicit discharge identification, reporting, and response.
- ✓ The permittee does not track illicit discharge events and does not target areas of the MS4 for additional inspection based on areas with past incidents.

5. Post-Evaluation Activities

5.1 Preparing the Written Report

After the MS4 SWMP evaluation, it is important that a written description of findings is provided to the permittees. Using only an oral outbrief is not a sufficient way to convey any recommendations or requirements for program improvement. Keep in mind that an NPDES permit is a contract between the permittee and the permitting authority and all correspondence regarding that contract should be in writing. Also, remember that a SWMP evaluation is typically taken very seriously by MS4 staff and management. The written findings often are distributed amongst upper management or to the governing body of the MS4 (i.e., city council). And finally, the permittee has undoubtedly invested numerous staff hours preparing for the evaluation and providing you with necessary information during the on-site evaluation itself. Therefore, it is incumbent upon you to take the necessary time to develop a concise, thorough, and fair written assessment of the findings obtained.

As soon as possible after the evaluation, it is recommended that you review all notes and supporting information obtained prior to and during the on-site evaluation and document the findings and conclusions. As a general guideline, the final report should be provided to the permittee within 6 to 8 weeks after the evaluation. Less time may be needed to prepare a report for an abbreviated program evaluation or for a screening level evaluation. On the other hand, more time may be needed if contractors perform the evaluation because the draft report would need to be reviewed by permitting authority staff to approve all findings, conclusions, and recommendations.

Conclusions drawn should be defensible and based on permit requirements and conditions, the SWMP, measurable goals, or a best professional judgment interpretation of the NPDES regulations and Clean Water Act. In addition, it is critical that conclusions drawn are consistently applied to all permittees evaluated. If a permitting authority uses more than one staff person to conduct an evaluation, an effort should be made to calibrate assessment techniques to ensure equitable evaluations. This can be accomplished by daily discussions amongst the evaluators to compare findings during the evaluation as well as quality assurance reviews of the resulting evaluation report.

The report should state which permittee(s) were evaluated, for what SWMP components, the date, a basic description of how the evaluation was conducted, relevant findings, and any recommendations for future evaluations or follow-up activities.

Depending upon the goals of the evaluation, there are many different ways to document the findings:

- **Determination of compliance status.** If assessing the compliance status of a permittee with its MS4 permit and SWMP is the only goal of an evaluation, then the report can very simply, describe each permit requirement the MS4 is not complying with and the associated requirement. The report can also indicate the areas of compliance as well, or state up front that if the permit requirement is not discussed in the report, no recommendations or requirements apply to that item.
- **Assistance with permit issuance or renewal process.** If the evaluation is conducted after the issuance of a new permit or during renewal of an existing permit (Phase I or Phase II MS4s), the report might discuss recommendations for effective implementation of the new SMWP or discuss recommended changes to the existing SWMP determined during the audit.

- **Assessing pollutants of concern.** If the permitting authority conducted the evaluation to assign an applicable waste load allocation, or to assist the permittee in implementing the waste load allocation for a particular pollutant of concern, the report may focus on only those components which minimize that pollutant. Or the report may make recommendations about how the SWMP could be changed to better address an existing waste load allocation.

As previously stated, the most common goal of an evaluation is to determine compliance with an existing permit. In this instance, in addition to providing recommendations for improvement or required actions to gain compliance, the permitting authority may find it helpful to provide positive feedback as well. Typically, it is not advisable to describe SWMP components that are not associated with a particular evaluation finding as this type of descriptive detail is found in the annual reports.

Findings can be divided into three categories:

1. **Permit violations.** Permit violations are areas where the evaluation found the permittee not in compliance with a specific permit requirement or SWMP commitment. Use of the qualifier "potential" can be used depending on the severity of the violation.
2. **Program deficiencies or recommendations for improvement.** Program deficiencies are areas of concern impeding effective program implementation. They are typically areas where the permit or SWMP does not describe specifically how the permittee should conduct an activity, yet the permitting authority evaluator believes the permittee should alter how they conduct the activity to meet water quality goals. Deficiencies can also be areas where future permit violations could result if the permittee continues on its present path.
3. **Positive or commendable program elements.** Positive program elements indicate activities that are "above and beyond" the requirements of the permit and SWMP. It is always a good idea to commend innovative approaches and techniques utilized by permittees. Not only does this encourage the permittee to continue implementing the program, it allows other permittees to learn about the approach if they read the evaluation document.

EXAMPLE FINDING:

The Parks and Recreation Department has developed a pollutant-based BMP manual.

The manual is innovative in that a diverse work group first identified the pollutants of concern and then developed suites of BMPs to minimize their occurrence or impacts on receiving waters. The resulting manual provides about 30 individual BMPs grouped into four categories: organic, chemical, maintenance, and administrative.

Each BMP description provides procedures; maps; monitoring frequency; additional references; the names of city and non-city employees who perform the task; site-specific equipment needs; possible locations of use; possible surfaces affected; procedures for spilled, dumped, or mishandled products or activities; evaluation criteria; and the staff responsible for BMP development.

People from multiple department sections collaborated on the BMPs to ensure that they are appropriate and can be implemented. The manual could be a guide for other city departments or Phase I and II programs throughout the country because it describes the entire BMP development process from conception through field-testing.

The following are format suggestions to use when drafting findings from the MS4 program evaluation:

- Organize findings by program component (e.g., all findings related to the industrial/commercial facilities component)
- Group similar findings for that component together (i.e., all positive attributes)

- Provide a heading for each individual finding that is a complete sentence and that clearly summarizes the significant point. For example, if there is a permit violation, the heading should state what the permittee is doing that is a violation: "The City does not currently inspect all industrial facilities annually as required by the permit."
- Describe each finding in detail. The narrative description should clearly define the finding and then describe the supporting information obtained or observed during the evaluation that led to this conclusion. The finding narrative should describe what the permittee was required to do (which is particularly important for a permit violation), briefly restate (paraphrase) the finding, and then provide the information obtained during the evaluation that supports this finding in as much detail as possible. When describing a positive attribute the finding should clearly state how the activity being described is innovative and not merely compliant.
- Insert applicable permit citations and language in potential permit violations. If a program deficiency relates to a particular part of the permit or SWMP, be sure to cite the appropriate language as well.

EXAMPLE FINDING:

The City has failed to notify industries and commercial facilities of the stormwater requirements and appropriate BMPs for implementation.

Part F.3.b(4) of the permit requires the permittee to implement, or require the implementation of, designated minimum BMPs (based on the site's threat to water quality rating) at each industrial site within its jurisdiction. BMP implementation was to occur by no later than 365 days after the permit was adopted. At the time of the evaluation, the City had yet to implement, or inform applicable industrial sites of their responsibility to implement, appropriate BMPs. The City needs to inform all applicable industrial sites of their responsibility and also needs to provide them with the minimum BMPs outlined in the SWMP.

In some cases, it might not be possible to determine compliance with a program component because of the limitations of the MS4 program evaluation process (i.e., not reviewing each industrial inspection report), because of time constraints, or because the requirement itself is not definable. The written report should then state that this is the case and provide as much supporting information as possible, such as "Compliance with public education and participation permit requirements could not be determined because…" If there were no findings of note for a particular SWMP component, it is important to state this fact so it is clear that the component was reviewed: "No recommendations or requirements were identified for this program component."

After an MS4 program evaluation report is developed, the permitting authority typically distributes the report to the permittee(s) evaluated with a cover letter summarizing the findings of the evaluation and any enforcement action being taken or corrections required. It is important that the report be distributed in a timely manner to ensure that requirements and recommendations can be instituted by the permittee(s).

The cover letter should request a written response within a specific time period (e.g., 30 to 60 days) addressing any permit violations or deficiencies noted. Normally, permittees are given an opportunity to refute findings or appeal violations noted. A meeting also can be scheduled with the permittee(s) to discuss proposed modifications to its SWMP to address the permit violations and deficiencies described in the report. In either case, the permitting authority should request a formal response describing the compliance process and schedule including appropriate milestones. The permitting authority should review the response and continue to work with the permittee(s) to improve the SWMP per the evaluations findings.

Photo Logs

Photo logs are used to visually illustrate items noted during field inspections. A photo log can be an important part of an MS4 program evaluation report and can assist a permitting authority in assessing potential permit violations. It is important to keep in mind that you are not inspecting the actual construction sites and industrial facilities visited for compliance with general permit or SWPPP conditions, but documenting the condition of these facilities with photos can help to assess compliance with MS4 permit conditions.

TIP:

Photos do not need to be used in the MS4 program evaluation report. An evaluator can take photos to help remember issues identified during field visits. The photos can also help you build a photo library of stormwater BMPs and problems.

To address potential legal concerns related to digital photographs, EPA published a guidance document on the use of digital photographs—*Digital Camera Guidance for EPA Civil Inspections and Investigations.* This document identifies requirements necessary to ensure the integrity of digital pictures. It addresses image capturing, storage, and handling and provides an overview of digital camera technology, peripheral equipment, and recommended steps. If digital images are to be used in court, their credibility usually depends on reliability, reproducibility, and security. As stated in the guidance, it is acceptable to make changes to digital images such as cropping, enlarging, or making them lighter/darker to improve the sharpness, provided the evaluator does all the following:

- Records how, when, and where the picture was taken,
- Logs the steps used in processing the image when they include techniques other than those used in a traditional photographic darkroom,
- Complies with a written SOP that includes the recommended steps set forth in this document, and
- Ensures the preservation of the original digital image.

To view EPA's *Digital Camera Guidance for EPA Civil Inspections and Investigations*, visit http://www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesinspectapph.pdf.

In general, it is important to keep careful notes of the photographs taken, including location and why the photograph was taken. It is helpful for the first photo taken to be of the facility sign or building. This helps to orient the photo log layout when photos are viewed after the evaluation.

For an MS4 program evaluation, it is not necessary to photo document all aspects of the facilities inspected, however, photos should be used to highlight issues on site that may lend credence to an issue described in the MS4 program evaluation report. For example, stormwater problems at a municipal maintenance yard should be documented with photos to provide additional documentation of problems. During inspections of construction sites or industrial facilities, photos can help document the issues the permittee's inspector addressed. At a minimum, even if the photos are not used in a formal report, the photos can help recall conditions at the sites visited.

Taking Photos

A digital camera should be used to take pictures where possible. Also, it is usually not necessary to set the resolution of the camera to its highest settings—most photo logs do not need high-resolution photos. Additional tips on taking good photos during an MS4 program evaluation include:

- **Take lots of pictures.** With digital cameras, deleting extra photos is easy. For something particularly important, take at least 4-5 pictures.
- **Use photos to identify sites.** When inspecting multiple sites, use the first picture to photograph the sign, SWPPP cover, or file name to be able to identify the facility later.
- **Consider perspective.** Have someone stand in the photo or place something of recognizable size, like a hard hat or clip board, to gain perspective.

Creating Photo Logs

Photo logs are often created using word processing software or presentation (e.g., PowerPoint) software. The following steps for creating a photo log are based on Microsoft Word:

- It is recommended that photo logs be created in Microsoft Word and the photos saved in a standard format such as jpeg or gif. Consider the resolution of the photos: many reports are made available electronically, and high-resolution photos can cause file size to exceed many users' download capabilities.
- Size the photos to be 3.5" tall with the width set by Microsoft Word for landscape view and 3.5" width with the height set by Microsoft Word for portrait view.
- Center the photos and captions on the page. (Note: Microsoft Word requires that the picture layout not be "in line with text" in order for the photo to be centered on the page.) Generally a page will have two landscape oriented photos or one portrait.
- Each photo should be numbered.
- Document the date and/or time to help identify photos.
- Photo captions should briefly describe what is observed in the picture and the location (both the facility or site name and the location within the facility or site).
- A photo log can contain a separate narrative to describe the findings, or individual photos can be referred to within the body of the MS4 program evaluation report.

Photo 1: Improperly installed silt fence

5.2 Follow-Up Activities

An MS4 program evaluation can result in several different follow-up activities, from enforcement to technical assistance to permit reissuance. Several of these activities are described below.

Technical Assistance

Many MS4 program evaluation findings will result in a deficiency that requires the permittee to modify or improve a program area to achieve compliance. The permitting authority can help ensure compliance by providing technical assistance to the permittee on issues related to these deficiencies. As a reference and useful tool for permittees, EPA has developed case studies of selected stormwater programs available at http://cfpub.epa.gov/npdes/stormwater/casestudies.cfm

Where necessary, the permitting authority may wish to provide additional technical assistance or training to address specific deficiencies identified during the evaluation.

Follow-Up MS4 Program Evaluations

Follow-up MS4 program evaluations should be conducted where major deficiencies have been identified and the permittee needs additional time to correct them. The permittee should be given time to correct any deficiencies, but a follow-up evaluation should be scheduled for deficiencies that cannot be documented via annual reports or written correspondence.

Targeted Evaluations

If an MS4 program evaluation identifies a program area that appears to be a common problem amongst several permittees, then the permitting authority may want to conduct targeted evaluations of that program area at additional permittees. For example, if stormwater compliance problems are identified at most of the public works yards visited, the permitting authority might want to target additional inspections for those yards.

Permit Issuance or Renewal

A thorough review of submitted annual reports along with an on-site evaluation is very helpful when issuing MS4 permits. Specific permit requirements could be drafted to address any deficiencies identified during the evaluation. Also, the evaluation may reveal current permit requirements that are no longer applicable or need to be revised to meet current conditions. An MS4 program evaluation is also an excellent time to collect additional data for permit reissuance, or verify data or clarify information submitted with the permit reapplication.

MS4 Enforcement

Taking enforcement on a violation identified during an evaluation will obviously depend on a variety of factors including the severity of the violation, any discharge to a water of the U.S., history of past violations, and other factors. To make a case for an enforcement action, it is important to collect information that documents the violation, including copies of records, photographs, or other documentation. An enforcement action is the last course of action to ensure compliance, but even the possible threat of an enforcement action will usually help bring about compliance.

Appendix A – Glossary & Acronyms

Authorized Program Or Authorized State – A state, Territorial, Tribal, or interstate NPDES program which has been approved or authorized by EPA under 40 CFR Part 123.

Best Management Practice (BMP) – Policies or practices that prevent, reduce, or mitigate the impacts of stormwater runoff. These methods can be structural (e.g., devices, ponds) or non-structural (e.g., policies to reduce imperviousness). BMPs classified as "non-structural" are those that rely predominantly on behavioral changes rather than construction in order to be effective. "Structural" BMPs are engineered or constructed to prevent or manage stormwater. BMPs are often further classified into (1) source control BMPs to prevent pollution, (2) water quality BMPs to reduce or prevent pollutants in runoff, (3) flow control BMPs to reduce the volume of stormwater and (4) infiltration BMPs to increase infiltration.

Best Professional Judgment (BPJ) – Using all reasonably available and relevant data to make a decision.

CIP – Capital Improvement Project

Clean Water Act – Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

Construction General Permit (CGP) – Where EPA is the permitting authority, the Construction General Permit (CGP) outlines a set of provisions construction operators must follow to comply with the requirements of the NPDES stormwater regulations. The CGP covers any site one acre and above, including smaller sites that are part of a larger common plan of development or sale, and replaces and updates previous EPA permits.

Co-permittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator.

Combined Sewer Overflow (CSO) – A discharge of untreated wastewater from a combined sewer system at a point prior to the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters.

Comprehensive Plan – A general plan that identifies a community's long-range growth and development goals. Comprehensive plans and watershed plans often overlap in areas of natural resources, analysis of current conditions, and growth trends. Comprehensive and/or watershed plans often include smaller subarea plans, with additional details on infrastructure, open space, parks, neighborhood design, drainage, and circulation.

DOT – Department of Transportation

EPA – United States Environmental Protection Agency

Floatables – Plastics and other floating debris (e.g., oil, grease, toilet paper).

General permit – An NPDES permit issued under 40 CFR 122.28 that authorizes a category of discharges under the CWA within a geographical area. A general permit is not specifically tailored for an individual discharger.

Geographic Information System (GIS) – A computer application used to store, view, and analyze geographical information, especially maps (*taken from the American Heritage Dictionary*).

IDDE – Illicit Discharge Elimination and Detection

Illicit Discharge – Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.

Impervious Surface – A hard surface area that either prevents or retards the entry of water into the soil mantle as occurs under natural conditions (prior to development), and from which water runs off at an increased rate of flow or in increased volumes. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, compacted soil, and roadways. "Effective impervious surface" is commonly used to describe impervious surfaces connected to receiving water directly or with a conveyance device (e.g., curbs, pipes, gutters).

Integrated Pest Management (IPM) – Planned program that coordinates economically and environmentally acceptable methods of pest control with the judicious and minimal use of toxic pesticides. IPM programs are based on a careful assessment of local conditions, including such factors as climate, crop characteristics, the biology of the pest species, agricultural practices, soil quality, and government regulations. The tactics employed range from changes in agricultural methods, such as better tillage to prevent soil erosion and interplanting of different crop varieties; natural biological weapons, such as the introduction of beneficial insects that eat the harmful species; and mechanical tools, such as vacuums that pull the insects off of the crops. Toxic pesticides are used only when all other methods have failed (*taken from the Columbia Press Encyclopedia*).

MOU – Memorandum of Understanding

MEP – Maximum extent practicable

Multi-Sector General Permit (MSGP) – Authorizes the discharge of stormwater from industrial facilities, consistent with the terms of the permit, in areas of the United States where EPA manages the NPDES permit program.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law)...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States. (ii) Designed or used for collecting or conveying stormwater; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) – A national program under Section 402 of the Clean Water Act for regulation of discharges of pollutants from point sources to waters of the United States. Discharges are illegal unless authorized by an NPDES permit.

Notice of Intent (NOI) – Submission of a completed NOI constitutes notice that the entity intends to be authorized to discharge pollutants to waters of the United States, from the facility or site identified in the

form, under a State or EPA general permit such as the Phase II MS4 General Permit, the Multi-Sector General Permit (MSGP) for industrial stormwater, or the Construction General Permit (CGP).

Notice of Violation (NOV) – Enforcement mechanism used to inform regulated entities of noncompliance

Outfall – A point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

Permitting Authority – The United States Environmental Protection Agency, EPA, a Regional Administrator of the Environmental Protection Agency or an authorized representative.

Pollutant of concern (POC) – Any pollutant that has been identified as a cause of impairment in any water body to which the MS4 discharges.

Publicly Owned Treatment Works (POTW) – A treatment works, as defined by Section 212 of the CWA, that is owned by the state or municipality. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant [40 CFR 403.3]. Privately-owned treatment works, Federally-owned treatment works, and other treatment plants not owned by municipalities are not considered POTWs.

Sanitary sewer overflow (SSO) – Occasional unintentional discharges of raw sewage from municipal sanitary sewers. SSOs have a variety of causes, including but not limited to severe weather, improper system operation and maintenance, and vandalism. EPA **estimates that there are at least 40,000 SSOs each year**.

Stormwater – Stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Pollution Prevention Plan (SWPPP) – Plan developed to minimize the discharge of pollutants from an industrial site (including construction activities) to the maximum extent practicable using BMPs.

Total Maximum Daily Load (TMDL) – A water quality assessment that determines the source or sources of pollutants of concern for a particular waterbody, considers the maximum amount of pollutants the waterbody can assimilate, and then allocates to each source a set level of pollutants that it is allowed to discharge (i.e., a wasteload allocation).

Waters of the United States – 1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; 2. All interstate waters, including interstate wetlands"; 3. All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or c. Which are used or could be used for industrial purposes by industries in interstate commerce; 4. All impoundments of waters otherwise defined as waters of the United States under this definition; 5. Tributaries of waters identified

in paragraphs (1) through (4) of this definition; 6. The territorial sea; and 7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1. through 6. of this definition.

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