



MEMORANDUM

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TO: C.3. Permit Oversight Ad Hoc Task Group

FROM: Jill Bicknell and John Fusco, Program Staff

DATE: January 27, 2003

**SUBJECT: Draft Guidance for BMP Operation and Maintenance Verification Programs
(Permit Provision C.3.e)**

The purpose of this memorandum is to provide information and suggestions for implementing an Operation and Maintenance (O&M) verification program for stormwater treatment best management practices (BMPs).

Background

On October 17, 2001, the San Francisco Bay Regional Water Quality Control Board (RWQCB) amended the Santa Clara Valley Urban Runoff Pollution Prevention Program's Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit to add requirements for new development and significant redevelopment (Provision C.3.). The goal of Permit Provision C.3. is to address pollutant discharges and changes in runoff flows from significant new and redevelopment projects, through implementation of post-construction treatment measures, source control and site design measures, to the maximum extent practicable. One requirement of Permit Provision C.3 is the Operation and Maintenance of Treatment BMPs (Provision C.3.e). In accordance with this Provision, each Co-permittee is responsible for implementing an O&M verification program, which should include the following:

- C.3.e.i. Compiling a list of properties (public and private) and responsible operators for all treatment BMPs. In addition, the Dischargers shall inspect a subset of prioritized treatment measures for appropriate operation and maintenance, on an annual basis, with appropriate follow-up and correction.
- C.3.e.ii. Verification at a minimum shall include: Where a private entity is responsible for O&M, the developer's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and either
 1. A signed statement from the public entity assuming post-construction responsibility for treatment BMP maintenance and that the BMP meets all local agency design standards; or
 2. Written conditions in the sales or lease agreement, which require the recipient to assume responsibility for maintenance consistent with this provision; or
 3. Written text in project conditions, covenants and restrictions (CCRs) for residential properties assigning maintenance responsibilities to the Home Owners Association for maintenance of the treatment BMPs; or
 4. Any other legally enforceable agreement or mechanism that assigns responsibility for the maintenance of post-construction treatment BMPs.
- C.3.e.iii. O&M Reporting: The Dischargers shall report on their Treatment BMPs Operation and Maintenance Verification program in each Annual Report. The Annual Report shall contain: a description of the organizational structure of the Discharger's O&M Verification program; an evaluation of the Discharger's O&M verification program's effectiveness; summary of any planned improvements in O&M Verification; and a list or summary of treatment BMPs that have been inspected that year with inspection results.

To assist Co-permittees in implementing an O&M verification program, Program staff conducted a review of existing documents relating to the operation, maintenance and management of stormwater treatment

systems. Existing documents prepared by government and private organizations were collected and are available from the SCVURPPP website (www.scvurppp.org). They may be accessed by opening the text entitled *Guidance for BMP Operation and Maintenance Verification Programs* on the SCVURPPP homepage. Documents available on the website include stormwater ordinances, stormwater maintenance agreements and arrangements and miscellaneous documents (performance bonds, maintenance easements, information fact sheets and other relevant information). In addition, the handbook entitled *Operation, Maintenance and Management of Stormwater Management Systems* (prepared by the Watershed Management Institute, Inc.) was used as a primary reference based on its technical merit.

The primary goal of reviewing existing documents was to determine the key elements of a successful O&M verification program. This memorandum will provide a description of the key elements and provide common traits exhibited by successful O&M verification programs. For clarification, the following terms may be interchanged to mean the same thing: stormwater systems, stormwater BMPs, BMPs, stormwater treatment BMPs and stormwater treatment systems.

Observations Relating to Stormwater System Operation and Maintenance

Maintenance is recognized as an important component of stormwater BMP effectiveness and longevity. However, information gathered by stormwater agencies around the United States indicates that stormwater systems are not usually operated and maintained properly. The State of Maryland's stormwater program has conducted a series of surveys on the maintenance of stormwater practices. Results are available in a report entitled *Maintenance of Stormwater Management Structures, a Departmental Summary*. The report includes the following conclusions:

- a) Stormwater management facilities in Maryland, especially dry detention facilities, are not particularly well maintained. In fact, a majority of facilities have failed due to a lack of routine maintenance;
- b) Public facilities are better maintained than private facilities;
- c) Commercial/industrial facilities are more likely than residential facilities to be aesthetically satisfactory;
- d) Based on criteria set by the State of Maryland regarding satisfactory operation and maintenance, forty-five percent of commercial/industrial facilities were completely satisfactory (for O&M) compared to twenty-four percent of residential facilities. Operation and maintenance is more likely to occur when very clear ownership exists (e.g., commercial/industrial facilities). O&M was less satisfactory for residential developments, where a Homeowners Association or the developer is responsible;
- e) Commercial/industrial facility owners are more concerned about their image, including the appearance of their grounds, than residential facility owners. This is especially true if the residential facility owner is the developer.

The expense of maintaining most stormwater systems is relatively small compared to the original construction cost (United States Environmental Protection Agency, Stormwater Control Operation and Maintenance). Since stormwater system O&M is usually neglected, it appears that local governments may lack the basic tools to implement a successful O&M verification program (Center for Watershed Protection, Stormwater Practice Maintenance). Table 1 of Attachment A provides reasons why maintenance has been difficult to implement.

Key Elements of a Stormwater Maintenance Program

Post-construction stormwater maintenance is one element of a successful stormwater management program. Key elements of a stormwater maintenance program are included in Table 2 of Attachment A. Certain elements should be in place before and during construction, as well as after construction. The following section provides information on some of the key elements provided in Table 2. They include stormwater ordinances, performance bonds, maintenance agreements and arrangements and maintenance easements.

Stormwater Ordinances

Local regulations are an integral part of urban runoff programs. Their development and implementation are subject to public review and comment but not subject to formal review by a state legislative body. As a result, it is easier to enact and modify the technical requirements required for program implementation and evolution. At the local level, regulations are typically adopted as ordinances or municipal codes. Unlike other model ordinances enacted by local governments, operation and maintenance ordinance language is not "stand-alone." It is usually one aspect of a local stormwater ordinance. When stormwater ordinances are developed, it is necessary to include very detailed program requirements which assure long term maintenance and operation of stormwater systems.

The purpose of a stormwater ordinance with operation and maintenance language is to ensure that: a) designs facilitate easy maintenance and b) regular maintenance activities are completed by the landowner. Maintenance and operation ordinances usually consist of concise language requiring or detailing maintenance easements, maintenance covenants, maintenance agreements and arrangements, inspections, right-of-entry for inspection, failure to maintain practices, recordkeeping, enforcement and penalties. Examples of stormwater ordinances from other jurisdictions are available on the SCVURPPP website. A flow chart showing the elements of a stormwater ordinance is provided in Figure 1 of Attachment A.

Stormwater Operating Permits

Some local governments have implemented Stormwater Operating Permit Systems. Language detailing a Stormwater Operating Permit System is usually included in the local stormwater ordinance. With this approach, landowners are required to obtain an operating permit (and pay appropriate permit fees) prior to using an on-site stormwater system. One key aspect of an operating permit is that the permittee is legally obligated to operate and maintain the stormwater system in a manner consistent with all state and local requirements.

Stormwater Utility

Since most stormwater programs draw from a general tax fund or use property taxes for revenue, local governments across the United States are considering the implementation of a stormwater utility to fund stormwater management and water-quality programs.

A stormwater utility is a special assessment district created to generate funding specifically for stormwater management. Users within the district pay a stormwater fee. The only people who benefit from stormwater utilities are the users who pay the fees. Revenue is used to support maintenance and upgrades of existing storm drain systems; development of drainage plans, flood control measures, and water-quality programs; administrative costs; and some instances, construction of major capital improvements. Stormwater utilities are typically created with two ordinances. The first ordinance establishes the utility and the second sets the rate structure. Proposition 218 may affect the implementation of a stormwater utility.

Performance Bonds

In some instances, state and/or local governments are requiring the submittal of performance bonds or securities by developers to the local municipality to ensure that proper operation and maintenance is performed. Language requiring a performance bond is included within a stormwater ordinance. Performance bonds are submitted prior to construction of stormwater systems.

The purpose of the bond is to provide an incentive for both proper construction and long-term maintenance of stormwater systems after construction. Most performance bonds are set at the maintenance cost estimated for the period that the landowner has maintenance responsibility. The performance bond is released when the responsibility for maintenance is passed on to another party through an approved maintenance agreement. The posting of performance bonds may require specific legislative authority.

Maintenance Agreements and Arrangements

To assist in the development of a model maintenance agreement, Program staff has gathered several

examples of existing maintenance agreements used within the United States. The language found in each example is worthy of consideration. Example maintenance agreements are available on the SCVURPPP website.

A stormwater maintenance agreement is a formal contract between a local government and a property owner, including a Homeowners Association, designed to ensure that specific maintenance functions are performed in exchange for permission to develop property. Local governments benefit from these agreements since the responsibility for regular maintenance is placed upon the property owner or other legally recognized party.

A maintenance agreement can be an effective tool for ensuring long-term maintenance of stormwater systems. The most important aspect of any maintenance agreement is the clear delineation of responsibilities of each party entering the agreement. Basic language that should be incorporated into an agreement includes the following:

Performance of Routine Maintenance

Some local governments prefer to have property owners perform all maintenance according to the requirements of the most recently adopted BMP Design Manual. Other local governments require that property owners do aesthetic maintenance (i.e., mowing, vegetation removal) and implement pollution prevention plans, but the local government accepts responsibility for inspecting and maintaining the stormwater system's structural components (including the periodic removal of debris and accumulated sediments).

Annual Inspection/Maintenance and Certification

Maintenance requirements will vary depending on the stormwater treatment device. However, local governments usually require, at a minimum, the annual inspection of the stormwater system. The inspection covers the entire facility, including berms, outlet structure, pond areas, access roads, etc. Observed deficiencies, required maintenance and repairs are documented within an inspection report. The inspection report is submitted to the local government, who may then choose to perform an inspection of the facility. In some cases, local governments are requiring the landowner to certify that the stormwater system is regularly inspected and maintained. In addition, the local government usually provides the landowner with a standardized inspection form used during inspections.

Inspection Requirements

Local governments may commit to performing an annual inspection of the stormwater system, or may choose to inspect when deemed necessary, based on the type of treatment device and available resources. To ensure the proper functioning of the stormwater system, local governments may find it necessary to include language allowing maintenance requirements and/or frequencies to be increased. Inspections are usually completed by the local government or other authorized agents (certified stormwater inspector or registered professional engineer).

Access to Stormwater Systems

Maintenance agreements should grant permission to a local government or its authorized agents and employees to enter a property (to inspect stormwater systems) whenever necessary. If deficiencies are observed, the local government should provide a copy of the inspection report to the property owner and provide a reasonable timeline for the maintenance and/or repair of these deficiencies.

Failure to Maintain Stormwater Systems

In the maintenance agreement, the local government should list the steps available for addressing a failure to maintain the stormwater system. Language allowing civil or criminal penalties for operation and maintenance violations and/or access to enter the property (to take whatever steps necessary to correct deficiencies identified within an inspection report) is essential, along with the authority to charge any costs for maintenance and repairs back to the property owner. The local government should include deadlines for repayment of maintenance costs and provide for liens against property up to the cost of the maintenance plus interest.

No Liability of Any Kind Clause

The agreement should provide a clause stating that the agreement imposes no liability of any kind whatsoever on the local government. The clause should also state that the landowner agrees to hold the local government harmless from any liability in the event the stormwater system fails to operate properly.

Recording of the Maintenance Agreement

An important aspect of the maintenance agreement is that it should be recorded into the local deed records. This will ensure that the maintenance agreement is bound to the property in perpetuity.

Maintenance Easements

To ensure that facility access (at reasonable times) and ample space is provided near a stormwater system for inspection, maintenance, repair, etc., local governments may need to execute a maintenance easement agreement (separate from a maintenance agreement) that is legally binding with all current and future landowners served by the stormwater system. The maintenance easement agreement should be recorded with the local government's land records.

In some instances, some local governments include easement requirements into a model maintenance agreement. This option reinforces a local government's right to enter and inspect a stormwater system.

Options for Managing Stormwater Maintenance Programs (Post-Construction)

Several options exist for managing stormwater maintenance programs. The major difference between options is the level of responsibility placed on individual property owners (private) and the local government (public). An analysis of both is provided below:

Option 1: Private Maintenance

With this option, private landowners (commercial/industrial property owners, Homeowners Associations, developers, private residents, etc.) are responsible for every aspect of maintenance (routine maintenance and major repair). Local government responsibilities under this option include inspection, education programs, maintenance tracking and enforcement. Education programs have been proven to be successful in accomplishing maintenance (e.g., Hillsborough County, FL's "Adopt-a-Pond" program).

Commercial/Industrial Property Owners

The Maryland survey indicates that commercial/industrial property owners usually either contract maintenance or have staff dedicated to stormwater system maintenance. Individuals conducting stormwater system maintenance are usually responsible for general site maintenance and landscaping.

Homeowners Associations and other Residential Landowners

The proper maintenance and operation of residential stormwater systems by Homeowners Associations and other residential landowners is less common. Typically, these entities do not have the technical expertise to inspect or maintain stormwater systems or the commitment to assess their members the required funds needed to contract maintenance. As a result, the implementation of a maintenance agreement or an operating permit system can greatly increase compliance by Homeowners Associations.

Benefits of Having Private Landowners Responsible for Maintenance

The major benefit of having private landowners responsible for maintenance is that costs (to the local government) are significantly reduced. In addition, this option is well suited to small communities because it relieves them of hiring additional staff members to maintain BMPs.

Option 2: Public Maintenance

With this option, the local government is responsible for BMP maintenance. This option appears to be the best solution for assuring the long term and routine O&M of stormwater systems serving residential developments. For example, King County, Washington has a policy of taking over the O&M of stormwater detention basins in residential developments, and requires the developer to dedicate the land

containing the basin as a public right-of-way. However, this option is not very common due to funding issues, required staff and potential legal liabilities with private entities. A successful public maintenance program requires sound program administration requirements for O&M, detailed information relating to each practice, dedicated and knowledgeable staff and an adequate program funding mechanism (i.e., a stormwater utility). In certain circumstances, local governments switch from Option 1: Private Maintenance to this option during program maturation.

Recommended Next Steps

This memorandum describes several key elements for the successful implementation of an O&M verification program. The C3PO AHTG should determine what direction the Program should take in developing models for local implementation by Co-permittees. Maintenance agreements between landowners and local governments are just one aspect of a successful O&M verification program. The C3PO AHTG should form a work group to complete the required tasks of developing model language for agreements and possibly ordinances.

References

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Attachment A

Table 1: Key Reasons Why BMP Maintenance Has Historically Been Difficult to Implement *

- Inability to physically locate BMPs.
 - Inability to track responsible parties.
 - Dedicated staff not assigned to inspection.
 - Designs not conducive to easy maintenance.
 - Lack of enforcement authority and access.
 - Owners of BMPs are unaware of their responsibilities.
 - Proliferation of BMPs that require intensive maintenance.
 - Insufficient funding sources.
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Table 2: What Are the Key Elements of a Stormwater Maintenance Program? *

- Stormwater Operation and Maintenance Ordinances
 - Performance Criteria and Design Guidance
 - Construction Inspection Checklists
 - Performance Bonds
 - As-Built Certification
 - Maintenance Agreements and Arrangements
 - Maintenance Easements
 - Best Management Practice Tracking Systems
 - Maintenance Plans
 - Maintenance Unit Costs
 - Maintenance Notifications and Reminders
 - Maintenance Inspection Checklists
 - Pollution Prevention Compliance
 - BMP Maintenance Educational Materials
 - Maintenance of Proprietary Products
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* Source: http://www.cwp.org/Maintenance_0702.htm

Figure 1- Elements of a Stormwater Ordinance

