



Standard Operating Procedure: Stormwater BMP Inspections

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Reasons for Procedure

The University of Virginia (UVA) has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes UVA to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act (VSMA).

UVA has installed best management practices (BMPs) that reduce the flow of storm runoff and reduce the amount of pollutants leaving the practice. In order for these BMPs to operate efficiently, they must be periodically inspected and have maintenance performed on them.

1.0 Purpose

The purpose of this procedure is to outline the process involved with setting up and conducting inspections of stormwater BMPs and initiating follow-up maintenance.

2.0 Scope

This procedure applies to staff in Environmental Resources, Landscaping, and Utility Systems Distribution.

3.0 Responsibility

3.1 Environmental Resources Staff

The SWM and E&SC Program Administrator, with support from the Civil Engineer, is responsible for keeping these procedures up-to-date, overseeing the BMP maintenance program for compliance with regulatory requirements, providing periodic training on conducting thorough BMP inspection, and providing technical support for maintenance activities.

3.2 Supervisors

Supervisors are responsible for ensuring their staff's compliance with this procedure. Supervisors are to train their employees on how to follow these procedures, using the most recent version of the SOP.

3.3 BMP Inspectors

Personnel must follow the correct procedures in accordance with the latest version of this SOP. Specific responsibilities are explained in the procedures described below.

4.0 Procedures

4.1 Add New BMPs to Inventory

Once record drawings are available for each new BMP installed on Grounds, the Program Administrator must ensure that the BMP is added to our GIS system and AiM. These databases must contain the following information:

- A UVA-specific, unique identifier in the following format: ME##-BLDG-N
 - ME## is the watershed sub-basin, e.g., ME06 or MO3A
 - BLDG is the four digit building number the BMP is associated with
 - N is a sequentially assigned number.
- BMP type
- A general description of the BMP’s location, including latitude and longitude (to be determined by GIS staff)
- Acres treated by the BMP, including total acres, as well as a breakdown of pervious and impervious areas
- The date the BMP was brought online (MM/YYYY).
- The sixth order hydrologic unit code (HUC) in which the BMP is located. Meadow Creek watershed is JR14; Moores Creek watershed is JR15; and Ivy Creek watershed is JR07.
- Whether the BMP is owned or operated by the permittee or privately owned.
- Whether the BMP is part of the permittee’s Chesapeake Bay TMDL action plan, a local TMDL action plan, or both.
- The name of the impaired water segments within each HUC (e.g., Meadow Creek, Moores Creek or Ivy Creek)
- The date of the most recent inspection conducted on the BMP.

4.2 General Inspection Frequencies and Responsible Parties

UVA FM has developed BMP inspection checklists tailored to each type of BMP and also the group performing the inspection (Landscaping or Utilities). Below is a list of the frequencies at which inspections are established in AiM:

BMP Type	Landscaping Inspections	Utilities Inspections
Biofilter	Monthly, Semi-Annual	Semi-Annual
Extended Detention (Dry) Pond	Monthly, Semi-Annual	Semi-Annual

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BMP Type	Landscaping Inspections	Utilities Inspections
Grass Channel	Monthly, Semi-Annual	Annual
Infiltration	Monthly, Semi-Annual	Semi-Annual
Permeable Pavers	Monthly, Annual	Semi-Annual
Rip Rap Channels	Monthly, Semi-Annual	Annual
Underground/Manufactured (specific to practice, location)	n/a	Monthly, Quarterly, Semi-Annual, Annual
Vegetated Roofs	Semi-Annual	n/a
Wet Ponds & Wetlands	Monthly, Semi-Annual	Monthly, Semi-Annual

Other timing recommendations include:

- Conduct semi-annual inspections within 72 hours after a significant rain event to look for signs of ponding water.
- Conduct semi-annual inspections in spring and fall before/after plants are in full foliage so as to better see any erosion problems.
- If possible, conduct at least one inspection per year during a rain event.

Maintenance of BMPs on UVA-owned land that is leased to third parties is the responsibility of the leasee per the standard UVA lease agreement terms.

4.3 Pre-Inspection Preparation

AiM provides reminders of when the inspections should be conducted, and includes the detailed inspection checklists tailored to the group and frequency. The inspector should print semi-annual and annual inspection checklists to take into the field; monthly checklists may be printed or viewed on a mobile device.

If unfamiliar with a BMP, the inspector should review the annotated maps available for each BMP that highlights contributing drainage area, inlets, forebays, outlets and other key features. These maps are available electronically in AiM and/or in the network folder G:\\PERMITTING\\Stormwater\\BMP Inspection Reports_BMP Maps\\.

The inspector may need the following tools during their inspection:

- PPE (boots, sunscreen, bug spray, etc.)
- Clipboard with checklists and pen
- Camera

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- Container for trash
- Shovel and/or rake and container for collected debris
- Cleanout pipe opening tool,
- Manhole puller
- Flashlight, and
- Sludge judge or other tool for gauging sediment building up in underground structures.

4.4 Inspection Process

Monthly - The inspector should review the monthly checklist/routine maintenance items for completeness. The checklist does not need to be turned in, but the monthly inspection must be marked as completed in AiM.

Quarterly/Semi-Annual/Annual Inspections - The inspector should review each checklist item, rate the severity of any problems identified, and attempt to fix them. Items that should be reviewed during the inspection and potential remedies to common problems are provided on the checklists. The inspector should clearly indicate on the inspection checklist if a problem was fixed, is scheduled to be fixed at another time (e.g., mowing or invasives removal), or requires engineering or funding support to be completed. If follow-up work is recommended, refer to the procedures in Section 4.5 of this SOP. Completed quarterly, semi-annual, and annual checklists must be submitted to the Program Administrator and the task marked as completed in AiM.

General - Trash removed from the BMP should be taken to an appropriate dumpster near the BMP or in the FM Yard. Leaves, sticks, and other naturally derived organic matter can be taken to the compost yard on Observatory Hill and placed in the leaf composting area. There cannot be any other litter or trash in this material and it cannot contain free liquids (i.e., it cannot be dripping wet). Do not leave this material piled adjacent to the outlet structure or other areas in or near the BMP.

4.5 Follow-up Maintenance Process

The Program Administrator reviews the completed inspection checklists for follow-up maintenance needs. All problems identified on the checklists will be summarized in a tracking spreadsheet located at <G:\\PERMITTING\\Stormwater\\BMP Inspection Reports\\SWM BMP inspection results.xlsx>.

Checklist items are ranked by the inspector using a scale of 0 to 3 where:

- 0 = Good condition. Well maintained, no action required.
- 1 = Moderate condition. Adequately maintained, routine maintenance needed.
- 2 = Degraded condition. Poorly maintained, routine maintenance and repair needed.
- 3 = Serious condition. Immediate need for repair or replacement.

The Program Administrator or Civil Engineer should field verify any problems ranked 2 or 3. If these rankings are confirmed, they will work with the Landscaping and Utilities Department

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to develop a maintenance plan, identify the needed resources (e.g., materials, outside contractors, etc.), and secure the project funding.

Problems ranked 1 require routine maintenance that in-house staff should be able to perform or contract for directly.

Separate phases shall be created in AiM to track inspections, routine maintenance, and non-routine maintenance. All inspection and maintenance work performed on a BMP should be billed against the BMP so the Program Administrator and Supervisors gain a better understanding of the true costs of maintaining the practices. Post-inspection follow-on work can either be set up as a new phase in AiM under the associated PM template or a new work order can be set up, but ensure it is associated with the BMP's asset number and asset funding method. If the inspector has any questions related to the BMPs and especially if they are uncertain of how to maintain the practices, they are to contact the Program Administrator or Civil Engineer.

4.6 Documentation and Reporting

Completed quarterly, semi-annual, and annual inspection checklists must be turned into the Program Administrator for scanning and filing. Inspection records must be retained for five years from the date of inspection. Staff should also provide to Environmental Resources estimates of the quantity of sediment removed from BMPs during maintenance activities for inclusion in the annual MS4 permit report.

Additional information to include in the annual MS4 permit report includes:

- Information on each new or modified BMP installed during the fiscal year,
- Number of BMP inspections completed.

Construction record drawings for a BMP must be maintained in perpetuity or until the BMP is removed.

5.0 Review of Procedure/Training

The Supervisors for Environmental Resources, Landscaping, and Utility Systems Distribution are responsible for conducting training and reviewing of this procedure with the appropriate staff at least once every 24 months as referenced in Section 3.2.

6.0 Regulatory impacts

Minimum Control Measure 5 in UVA's MS4 Permit requires adequate long-term operation and maintenance of the stormwater BMPs in accordance with written inspection and maintenance procedures. The BMPs shall be inspected at least once per year, and maintenance shall be performed on them as necessary.

*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version. Current versions of all SOPs are maintained on the UVA Environmental Resources website.

