

Tool 8: BMP Performance Verification Tool (for Proprietary BMPs)

Center for Watershed Protection, Inc.

December 31, 2008

Introduction to the BMP Performance Verification Tool

The number and types of proprietary stormwater BMPs have proliferated rapidly. While determining pollutant removal rates for non-proprietary structural BMPs is a constant challenge, the task of assigning and verifying rates for the ever-expanding menu of proprietary devices is even more daunting. Manufacturer claims can be difficult to verify, and the removal mechanisms and design flows of many proprietary devices are not clearly stated.

Local stormwater managers must make decisions about which BMPs are acceptable for use in their community and yet the vast majority of local stormwater managers may not have the benefit of state-level programs to assist with these decisions.

This BMP (Best Management Practice) Performance Verification Tool is designed for use by local stormwater managers to guide decision-making about BMP verification and approval.

The Tool guides local stormwater managers through a deliberate, systematic, repeatable and transparent process of performance evaluation. It consists primarily of:

1. A checklist that can be incorporated into the local regulatory program and modified for a community's specific needs.
2. A table that describes and differentiates between the major existing BMP performance verification protocols and testing programs.
3. An appendix that describes basic concepts and definitions in BMP performance verification.

It is hoped that dissemination of this performance tool will result in a systematic evaluation process that promotes equitable and non-arbitrary evaluation of proprietary devices for the joint benefit of local stormwater programs, project civil engineers, and the BMP industry.

How to Use the Tool

The checklist contains 5 basic steps (or tabs) that can be completed by either the local stormwater approval authority or the BMP vendor to help clarify the basic design, strengths and weaknesses of a specific device, and whether or not to approve use of the device for a given project or site.

This process can also be used to determine whether the BMP should be pre-approved for other similar sites or applications, so that the process does not need to be repeated with every new site plan seeking to utilize the same BMP. A description of each step in the BMP Tool Checklist is provided below.

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The Checklist

The checklist consists of the following sections which are to be filled out as indicated below.

Section 1: BMP Approval Context (To be completed by local program authority)

This includes basic information on the context under which a device is being considered for use, including pollutants of concern with special attention to particle size distribution.

Section 2: BMP Information (To be completed by vendor)

This tab includes basic parameters, such as warranty information, product history and precedent, and design strategy employed by the device to treat water quality and/or quantity.

Section 3: Performance Testing and Performance Verification (To be completed by vendor) This section asks the vendor to define any independent performance certifications provided by the major verification entities as well as the results of any in-house testing.

Section 4: Maintenance (To be completed by vendor) This section asks the vendor a series of basic questions regarding maintenance and provides a list of itemized annual maintenance costs for the regulator or project engineer to consider.

Section 5: Total Device Costs (To be completed by vendor) This section contains a simple spreadsheet to make sure all cost parameters are included in cost estimation, including unit costs, shipping, special design considerations and installation.

Section 6: Decision Status (To be completed by local program authority) The local program authority uses the information compiled in Sections 1 through 4 of the checklist, along with professional judgment, to approve, conditionally approve, or deny use of the BMP for the site in question and/or for general use within the jurisdiction.

A “conditional approval” may permit the vendor to install a small number of devices in the jurisdiction for testing purposes or allow the local program authority to request more information from the vendor prior to making a final decision and/or apply specific “conditions of approval” to accepting the BMP. The “Decision Status” tab provides suggested conditions of approval based on various “red flags” regarding pollutant removal requirements, maintenance issues, or the design and function of the device. The local program authority should modify or customize the decision status tab to best meet the local regulatory context.

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The user should note that the checklist includes parameters that are the basis to approve, conditionally approve, or deny use of the specific BMP. However, these parameters are not comprehensive. Local approval authorities will likely have unique requirements and are encouraged to revise, lengthen, shorten or create a new list of parameters in order to best document BMP approval decisions.

Appendices

A set of technical appendices are provided to assist the local program authority in understanding and setting minimum criteria for evaluating BMPs and navigating the world of BMP evaluation and testing.

- Appendix A: Evaluating BMP Efficiency
- Appendix B: Review of Existing BMP Evaluation Protocols and Testing Bodies
- Appendix C: Additional Resources
- Appendix D: References

Summary of Recommendations

Evaluating BMP Performance:

- Don't confuse BMP efficiency with BMP performance or effectiveness (see Appendix A for more information).
- Avoid using percent removal as the single measure of BMP efficiency. Rather, statistically determine the difference between influent and effluent quality, and/or focus on runoff reduction. See Appendix A for further explanation and guidance.
- As a general rule, concentration-based methods often result in slightly lower performance efficiencies than mass-based methods.
- Using concentration data alone may be misleading if the concentration is near the "irreducible level," which is the concentration below which the BMP cannot effectively trap or treat more pollutants.
- Use Suspended Sediment Concentration (SSC) when available in lieu of Total Suspended Solids (TSS) as measure of sediment concentration.
- Clearly identify the particle size distribution (PSD) being used by the vendor in testing the BMP.
 - The PSD should primarily consist of fine to medium size particles of 5-250 micron size range.
- Use flow-weighted, event mean concentrations (EMCs) so that the less frequent, larger storms do not dominate evaluation methods.
- Set minimum standards for vendor data quality objectives (DQOs).
- Determine the relative maintenance burden and requirements early in the BMP evaluation process – at the time of initial plan review.

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Available Resources:

- Check to see if your State agency has already approved a specific proprietary device for use in the State.
- If you are in CA, MA, MD, NJ, PA, VA, or IL you can look to the results of demonstration projects using TARP (testing protocols by state environmental agencies).
 - Note however that your state (if participating in TARP) may have specific caveats for BMP performance testing, so results from other TARP participants should be scrutinized.
- You can consider using those BMPs certified by NJCAT, which uses TARP testing protocol, but note that NJCAT tests use caveats specific to NJ.
 - NJCAT has certified 10 BMPs in 10 years.
- If your project is in MA, look to MASTEP for guidance, which is specific to Massachusetts. MASTEP also uses TARP testing protocols. Unfortunately no BMPs have been certified by MASTEP to date.
- If you reside in Washington State, you can defer to TAPE, which has approximately 13 devices certified for general use in the State.
- The International BMP Database has information on 340+ BMPs and is a good source for quality controlled data, but is not geographically specific and The Database is not a certifying or BMP-approving entity. You can use this Tool to help you scrutinize the results posted in The Database and decide if the BMP in question is appropriate for your needs.
 - The EPA Urban BMP Tool is a more user-friendly compilation of information on approximately 275 BMPs previously compiled by The International BMP Database.

Acronyms:

MASTEP: Massachusetts - Stormwater Evaluation Project

NJCAT: New Jersey Corporation for Advanced Technology

TAPE: Technology Assessment Protocol - Ecology

TARP: Technology Acceptance and Reciprocity Partnership

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The Center staff who worked on this tool include: Alexi Boado, Neely Law, David Hirschman, and Karen Capiella.