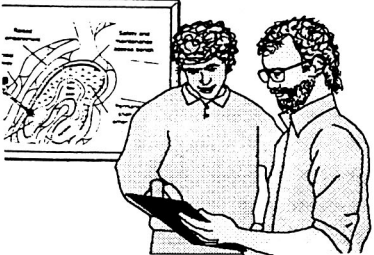


# Environmental Indicator Profile Sheet

|   |  |   |
|---|--|---|
|  | <p><b>Indicator Profile No. 22</b></p> <p><b>No. of BMPs Installed, Inspected, and Maintained</b></p> <p>Category: <b>Programmatic</b></p> | <p><b>Tools Used to Measure Indicator:</b></p> <ul style="list-style-type: none"> <li>• Development Site Plans</li> <li>• Property Owner/Developer Interviews</li> <li>• No. of Construction Permits Issued</li> <li>• Local Inspection Programs</li> </ul> |
|---|--|---|

**Description:**  
 By tracking the number of BMPs that are installed, inspected, and maintained in a given area, stormwater practitioners may be able to measure the progress and effectiveness of municipal programs. As more BMPs are installed, one may assume with reasonable confidence that progress in the stormwater arena is being made. Regular inspection and maintenance of BMPs will ensure that existing stormwater management resources are fully utilized, will help identify facilities which require retrofits, and will identify areas requiring additional management resources.

Program implementation can also be tracked through review of the maintenance backlog. Large BMP maintenance backlogs may indicate that additional monetary and manpower resources are required to ensure effective operation of existing BMPs.

- Utility of Indicator to Assess Stormwater Impacts:**
- Inspections can expose weaknesses in BMP design, reveal maintenance needs, and determine needs for enforcement actions.
  - Can be used to determine whether existing BMPs are sufficient in scope and size to adequately address a community's stormwater management needs.
  - Helps a municipality improve the design criteria for future BMPs by determining which practices have more problems.
  - Provides useful data when conducting stormwater retrofit inventories.

- Advantages of Method:**
- Since BMPs are specifically designed to provide a particular level of performance, it is relatively easy to determine whether their functions are being achieved.
  - Educational programs can be developed to involve private organizations in data collection. Such programs may also serve to educate the public about BMP usage, performance, and maintenance needs.
  - Increased performance monitoring and reporting increases the likelihood that BMPs will be properly maintained.
  - Can be combined with GIS and watershed simulation models to determine the cumulative watershed benefits of implementation of stormwater BMPs.

**Indicator Useful for Assessing:**

- \* Aquatic Integrity of:
  - Lakes
  - Streams
  - Estuaries
- \* Land Use Impacts
- \* Stormwater Mgmt Programs
- \* Whole Watershed Quality
- \* Industrial Sites
- \* Municipal Programs

*Key:*

Very Useful

Mod. Useful

Not Useful

**Indicator Advantages**

- \* Geographic Range
- \* Baseline Control
- \* Reliable
- \* Accuracy
- \* Low cost
- \* Repeatable
- \* All Watershed Scale
- \* Familiar to Practitioners
- \* Easy to use & Low training

*Key*

Very Advantageous

Mod. Advantageous

Not Advantageous

**Cost**

See Table 3.3E

**Disadvantages of Method:**

- There is little standardization in place for reporting BMP performance, possibly resulting in conflicting inspection reports.
- Many watershed managers choose BMPs based on cost, with design performance a secondary consideration. As a result, even if a BMP performs according to design, it still may not adequately protect receiving water quality.
- BMP inspections and maintenance are costly and require extensive staff time.

**Case Study:** Lindsey, G.; L. Roberts, and W. Page. 1992

**Maintenance of Stormwater BMPs in Four Maryland Counties: A Status Report**

*Journal of Soil and Water Conservation*. 47(5): 417-422, Sept./Oct. 1992.

Field inspections were made of more than 250 stormwater facilities in four Maryland counties. The types of facilities inspected included dry basins, wet and extended detention basins, infiltration basins and trenches, dry wells, underground storage facilities, and vegetated swales. Trained inspectors evaluated performance (inappropriate ponding of water, slow infiltration, incorrect flow patterns, clogging of facility, excessive sediment or debris, water bypassing facility, design shortcomings, structural failures, erosion at intake or outfall) and maintenance criteria (facility functioning as designed, quantity controlled as designed, quality benefits produced by ability, enforcement action needed, maintenance action needed) for each facility. While most (64%) of the facilities were found to be functioning as designed, many needed maintenance, especially to correct excessive sediment and debris problems. Inspectors believed that enforcement action was warranted at many sites. The condition of different types of facilities varied significantly. Several models were used to explain results, including a series of chi-square tests to determine the independence of facility status and objective and subjective variables. Overall, the investigations documented the need for improved inspection and maintenance by stormwater management regulatory authorities.

**Method References:**

- General: Galli, J.; 1992. *Analysis of Urban BMP Performance and Longevity in Prince George's County, Maryland.*, Metropolitan Washington Council of Governments. Publication No. 92711