

Sustaining DoD Investments: Stormwater BMP Maintenance



The Chesapeake Bay total maximum daily load (TMDL) requires the Department of Defense (DoD) to reduce nutrient and sediment pollutant loads in stormwater runoff through the implementation of permanent, post-construction stormwater best management practices (BMPs), which earn the DoD “credit” for pollutant reductions. Across the Chesapeake Bay watershed, DoD installations have installed over 3,400 stormwater BMPs since 1984. Most BMPs are designed to reduce nutrient and sediment pollution from the stormwater runoff they receive, collect, or intercept from pervious and impervious surfaces, like the runways, roads, housing areas, and other operational areas on defense facilities. However, these BMPs only provide pollution reduction credit if the required inspection and maintenance is completed, they pass inspection, and this information is reported to the appropriate regulatory entity.

Drivers for BMP Inspection

The source of inspection requirements for post-construction BMPs determines how often a BMP must be inspected. If the BMP is located on regulated land covered by a Clean Water Act (CWA) permit, inspections are required. Typically, inspections of BMPs are required on a 1- to 5-year cycle. Specific requirements are documented in the appropriate permit.¹

If the BMP is located on unregulated land (not covered by a CWA permit) and is within the Chesapeake Bay watershed, it is still subject to the requirements of the Chesapeake Bay Program Partnership’s (Partnership’s) stormwater BMP verification requirements. Within the Partnership’s verification framework, the BMP must be inspected within a defined timeframe, also known as the “credit duration,” for the BMP to continue to provide credit for the DoD toward its portion of the Chesapeake Bay TMDL. The credit duration varies by the type of BMP.¹

Performing regular inspections not only meets compliance but also documents if a BMP needs maintenance. Regular inspections can help identify problems early to correct minor maintenance issues before they become major repairs.

Stormwater BMP Maintenance

Routine Maintenance. For most types of BMPs, routine maintenance is necessary every one to five years. Conducting maintenance at the recommended frequency increases the



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In the past three years alone, DoD installations in the Chesapeake Bay have invested over \$68 million in BMP construction to comply with stormwater regulations and TMDL requirements that have been incorporated into CWA permits.

likelihood the BMP will continue to remove pollutants and function as designed. Routine maintenance will also limit the chance of BMP failure, which can require costly repairs.

The type of routine maintenance varies by BMP. There are some activities, such as removing trash from inlets and basins, mowing grass, weeding, mulching, or replanting vegetation that can be performed by groundskeeping staff or volunteers, while others, such as replacing engineered filtration media, may require specialty service contractors. Your state agency has more information about specific requirements by BMP type.¹

Studies have evaluated the general costs of routine BMP maintenance in different geographies. When installations select BMPs, they must balance the capital (construction) costs, long-term maintenance costs, cost per pollutant reduction, and area required by the BMP.

¹Links to learn more about BMP credit durations and state-specific BMPs requirements are included at the end of this fact sheet.





	TREE PLANTING	DETENTION AND RETENTION PONDS	BIORETENTION CELLS	BIOSWALES	PERMEABLE PAVEMENT
Average Annual Maintenance Costs	\$0	\$70	\$200	\$350	\$3,600
Lifetime O&M Costs	\$0	\$3,600	\$5,200	\$17,900	\$72,200
Replacement Cost	\$1,300	\$5,000	\$13,500	\$11,000	\$101,000
Per Unit	Per acre	per acre treated	per acre treated	per acre treated	per acre treated

Figure 1. BMP Operation and Maintenance (O&M) and Replacement Costs Comparison

BMP Repair. BMPs occasionally need more extensive maintenance and repair to continue to function. BMPs that are not routinely maintained are more likely to require these extensive repairs to gain basic function. BMP repair or replacement is a more expensive endeavor than routine maintenance. For some BMPs, the cost of repair can be twice the lifetime cost of routine maintenance. Figure 1 above compares the cost of maintenance over the lifespan of a BMP and the BMP's replacement cost to demonstrate the significant increase in cost if replacement is required.

Impacts to DoD in the Bay Watershed

As the previous sections demonstrate, BMP repair is significantly more expensive than routine maintenance. Therefore, funding of maintenance is a responsible use of taxpayer dollars. TMDL credit and, where CWA permits apply, regulatory compliance, is contingent upon installations providing regular inspection and maintenance of BMPs. In addition to notices of violation, there are multiple consequences the DoD may encounter if maintenance is not done:

Loss of credit. Lapsed inspection and maintenance will eventually lead to loss of nutrient and sediment credit for the BMP toward the Chesapeake Bay TMDL. For some BMPs, this means that the BMP may no longer accomplish the primary objective for which it was implemented. Numeric analysis performed by the DoD CBP demonstrates that the lost credit from lapsed inspection and maintenance of existing DoD BMPs would increase the level of effort needed to meet the Chesapeake Bay TMDL.

More future effort to reach regulatory requirements. If BMPs lose credit and funding for inspection and maintenance is not secured, implementation of new BMPs will be needed for the DoD to meet its compliance requirements and federal planning goals for pollutant reductions. This will cost more than inspection and maintenance and has the potential to negatively impact operational areas.

Negative exposure for the DoD. The DoD is a visible partner in the Partnership and has commitments to the Chesapeake Bay TMDL through Executive Order 13508 and the Chesapeake Bay Watershed Agreement. DoD will be evaluated by EPA on a regular basis on their progress toward nutrient and sediment reductions and other commitments. Progress assessments by EPA are made available to the public, and permitted installations must also submit annual reports to their state agency. These reports are publicly available documents for review by external parties.

Loss of other benefits. Many BMPs provide co-benefits for flood control and natural resources. Poorly maintained BMPs may impact more than just water quality—the consequences of failed or failing BMPs can impact mission readiness through flooding, erosion, and other negative outcomes.

Funding

Investing in BMP inspection and maintenance is worthwhile in the short- and long-term, but many installations have indicated that obtaining funds for this effort is a challenge due to other public works priorities like leaking roofs or road repairs. There is currently a sub-committee established within the DoD Clean Water Act Services Steering Committee to designate BMP-specific codes within the Facilities Sustainment Model that would promote more secure sources of funds. Until that time, installations should look for opportunities to leverage volunteers for Earth Day and the Clean the Base Day to perform basic maintenance and inspection of BMPs, such as trash collection, replanting, or mulching. Other existing contracts that are up for renewal may offer a means to integrate the performance of routine maintenance. In the context of BMP inspection and maintenance, the difference in cost between BMP maintenance and replacement demonstrates that these activities represent a wise use of limited fiscal resources for installation commanders and environmental staff.

For More Information

You can learn more about BMP credit durations defined by the Partnership from the CAST Phase 6 NEIEN Appendix at https://webservices.chesapeakebay.net/schemas/NEIEN%20NPS%20BMP%20CBP%20Data%20Flow_P6AppendixA%2017_7_03052018.xlsx

Learn more about your states' BMP inspection and maintenance requirements and guidance at:

Virginia: <https://www.swbmp.vwrrc.vt.edu/>

Maryland: https://mde.maryland.gov/programs/Water/StormwaterManagementProgram/Pages/stormwater_design.aspx

Washington, DC: <https://doee.dc.gov/service/bmp-maintenance-faq>

Pennsylvania: <http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4673>

West Virginia: <https://dep.wv.gov/WWE/Programs/stormwater/MS4/Pages/StormwaterManagementDesignandGuidanceManual.aspx>

New York: <https://www.dec.ny.gov/chemical/29072.html>