

# Water Quality Improvement Evaluation for Identification of Potential Best Management Practices at Fort Detrick and Forest Glen Annex, Maryland (Task N.0759)

## Statement of Need

The United States (U.S.) Environmental Protection Agency (EPA) is working with its state partners, including Maryland, to set restrictions on stormwater contaminants by establishing Total Maximum Daily Load (TMDLs) for nitrogen, phosphorus, and sediment in tributaries of the Chesapeake Bay. EPA is also working with its state partners to develop Phase II Watershed Implementation Plans (WIPs), designed to engage local governments, watershed organizations, conservation districts, citizens, and other key stakeholders in reducing water pollution. The Phase II WIPs will indicate how the partner states plan to achieve their shares of the Chesapeake Bay TMDL by further delineating pollution reduction targets by geographic location (e.g., watersheds, counties, etc.) and source sectors and by providing a description and schedule of actions to be taken to achieve the reductions. As a result, the State Phase II WIPs will require implementation of additional best management practices (BMPs) at municipalities throughout the state, including federal facilities, in order to achieve reductions of nitrogen, phosphorus, and sediment loads as required by the Chesapeake Bay TMDL. Both Fort Detrick and Forest Glen are located in the Chesapeake Bay Watershed; therefore, they must evaluate water quality improvements in order to identify potential innovative BMPs to achieve reductions of nitrogen, phosphorus, and sediment loads as required by the Chesapeake Bay TMDL.

## Technical Approach

The NDCEE Team evaluated options for managing water quality opportunities at Fort Detrick and Forest Glen Annex. This evaluation leveraged Geographic Information System (GIS) data developed under NDCEE Task 0715, as well as current data such as aerial photography provided by the installation. The data was used to complete a desktop analysis to eliminate unsuitable BMP sites and to prioritize subwatersheds to maximize the effectiveness of potential BMPs. Potential BMPs capable of providing water quality improvement were then chosen for placement within the BMP sites identified through the desktop analysis, focusing on the highest prioritized subwatersheds. Specific Maryland-approved BMP types considered to be suitable for each site were initially identified based on evaluating aerial imagery (available space, topography), site constraints, and connections to the stormwater system. BMP types considered to be most applicable for the prioritized BMP sites included bioretention, surface sand filters, wet pond retrofits, shallow wetlands, open channels, and permeable pavement. Thirty-three potential BMP Sites were initially identified for field investigation. The field assessments consisted of ground-truthing of treatment area delineations,

analysis of inlet and outlet conditions, and an evaluation of potential constraints. Both horizontal and vertical space for BMPs was assessed, any culverts measured, and flow directions determined to the extent possible. Potential site constraints included existing underground or overhead utilities, difficult access points, and inability to tie into the existing stormwater drainage network. While in the field, the crew determined what type of BMP would be possible within the site and the approximate construction cost factor for the BMP. Project costs were assessed using an engineering evaluation of the amount of cut or fill, utility or tree relocations, and construction complications. Ten BMP sites were then advanced to conceptual design, based on best professional judgment of relative construction cost and water quality treatment effectiveness.

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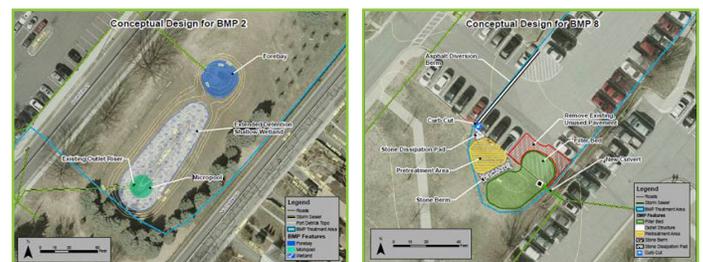
**Status**  
Completed

## Results and Benefits

This task provided a Concept Plan that evaluates the feasibility of implementing water quality improvements, in the form of innovative BMPs, to reduce pollutants discharged in stormwater runoff. The Concept Plan includes designs for innovative BMPs along with their construction costs, maintenance schedules, and potential pollutant load reductions. This information can be utilized by Fort Detrick and Forest Glen Annex to support decisions regarding the installation of future water quality improvement BMPs that may be required to achieve the load reductions required by the Chesapeake Bay TMDL.

## Technology Transfer and Outreach

The final Concept Plan was transferred to Fort Detrick and contained 10 conceptual BMP designs, along with their projected construction costs, maintenance schedules, and calculated load reductions.



Concepts Plans for potential BMPs designed to reduce pollutant loads in stormwater from Fort Detrick.

