



Land Development News

Technical Memorandum

Subject: BayFilter™ – Use under the Innovative Best Management Practices (BMP) Provisions of the Public Facilities Manual (PFM)

Date: April 23, 2010 **No.:** 10-03

Summary: Requests to use the BayFilter™ under the innovative BMP provisions of Section 6-0402.4 of the PFM may be submitted as part of plan submissions rather than by a separate letter of request. This *Letter to Industry* details the submission requirements and information required to be included in plans and design guidelines specific to this particular device (See *Letter to Industry #01-11* published October 2, 2001, for a more general discussion of the procedure.). Although requests may be included in plan submissions, requests will continue to be reviewed on a case-by-case basis and the Director of Land Development Services may disallow the use of an innovative BMP where its use is clearly inappropriate. The BayFilter™ is assigned a 50% phosphorus removal efficiency for a system with cartridges consisting of a mixture of silica sand, perlite, and activated alumina having a surface area of 43 sq. ft. with a maximum design flow rate of 30 gpm (0.067 cfs) per cartridge. The system must be designed to treat a maximum instantaneous flow rate of 0.7 cfs per acre or a minimum water quality volume of 1 inch per acre draining to the facility.

The guidance contained herein is for the manufacturer's current design, construction, and filter media specifications. Any changes to these specifications that may impact the system's hydraulic performance or phosphorus removal capability must be evaluated by the County prior to use.

Effective Date: Immediately.

Submission Process: Requests for approval to use BayFilter™ systems, as provided for under PFM Section 6-0402.4, may be included in plan submissions rather than by separate letter of request. In order to facilitate the tracking of requests and evaluation of the performance of these systems, a copy of the Innovative BMP Tracking form http://www.fairfaxcounty.gov/dpwes/forms/bmp_tracking.pdf shall be filled out and attached to the plan.

In accordance with PFM Section 6-0402.4, requests incorporated into plans must include the following site-specific information:

- Maintenance consideration and program (private maintenance required).
- Special construction details and specifications if needed.
- Estimated construction cost.
- Estimated 20-year maintenance cost.

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Certain information normally required for requests to use innovative BMPs has been deleted from the list because it is either not applicable or was evaluated during preparation of this letter.

Location and Siting: In residential areas, BayFilter™ systems must be located on Home Owner Association (HOA) (or “common”) property and may not be located on individual buildable single-family attached or detached residential lots or any part thereof. BayFilter™ systems may be located in the right-of-way subject to approval by the Virginia Department of Transportation (VDOT). BayFilter™ systems may not be located in the vicinity of loading docks, vehicle maintenance areas, or outdoor storage areas, where there is the potential for high concentrations of hydrocarbons, toxics, or heavy metals in stormwater runoff unless effective pre-treatment is provided to reduce the concentrations.

Maintenance: BayFilter™ systems must be privately maintained and a private maintenance agreement must be executed before the construction plan is approved. All special maintenance requirements are to be incorporated into the plan and appended to the County’s standard private maintenance agreement. Reports of maintenance inspections and activities as required by the agreement shall be provided to the Maintenance and Stormwater Management Division of the Department of Public Works and environmental Services. This requirement shall be incorporated into the standard private detention agreement. BayFilter™ systems may not be located in County storm drainage easements. Maintenance access must be provided for all facilities. Maintenance access routes must be depicted on plans for all facilities not located in parking lots or along streets. Per *Letter-to-Industry* #01-11, for innovative BMPs located in residential areas that will be maintained by an owner’s association, the developer must transfer sufficient funds to the owner’s association prior to bond release to cover a 20 year maintenance cycle. These funds shall not be available for use until after bond release.

General Design Requirements: Design and construction of BayFilter™ systems should generally conform to the manufacturer’s specifications as contained in the most recent design guidelines except as noted herein. The BayFilter™ systems shall be designed based on a maximum flow rate of 30 gpm (0.067 cfs) per cartridge for a cartridge consisting of a mixture of silica sand, perlite, and activated alumina having a surface area of 43 sq. ft. One Drain Down Module (DDM) is required for each standard cartridge installed. The system must be designed to treat an instantaneous flow rate of 0.7 cfs per acre or a water quality volume of 1 inch per acre draining to the facility. The drainage area to the facility must include both impervious and pervious areas. The water quality volume must be completely drained within 24 hours. In computing the drain down time, the discharge rate shall be based on the average hydraulic head as measured from the invert of the vault’s outlet. The bottom 6 inches of storage shall be treated as dead storage or assumed to have a discharge rate of 0.5 gpm per DDM. In addition to the computations for flow rate or water quality volume based designs, a sediment load analysis also shall be performed to determine the required number of cartridges. The larger of the two values shall be used. In performing the sediment load analysis, the annual load shall be determined using the Simple Method assuming an annual rainfall of 42 inches per year, a minimum TSS concentration of 60 mg/l, and a factor of safety of two. Where the facility may be subject to significant exposure to leaf litter, grass clippings, trash, and other debris, some form of pretreatment such as a hydrodynamic separator should be provided. The assigned phosphorus removal efficiency is 50%. Facilities shall be sited to adequately address bypass flow.

Materials Specifications: The filter media shall consist of a mixture of silica sand, perlite, and activated alumina per the manufacturer's specifications. Materials certifications from the manufacturer for the filter media shall be submitted to the County prior to bond release. Materials certifications must be based on batch test results performed by the manufacturer as part of a quality control/quality assurance program.

Inspections: A final inspection of the installed facility shall be performed by a licensed professional (In accordance with standard practice, the actual inspections may be performed by an individual under responsible charge of the licensed professional). The licensed professional shall certify that the facility was installed in accordance with the approved plans. The licensed professional's certification along with any material delivery tickets and certifications from the material suppliers and results of the tests and inspections shall be submitted to the County prior to bond release. For projects requiring as-built plans, the required certification and supporting documents shall be submitted with or incorporated in the as-built plans. For projects that do not require as-built plans, the required certification and supporting documents shall be submitted with the Residential Use Permit (RUP) or non-RUP request.

If you have any questions, please contact a Stormwater Engineer with the Stormwater and Geotechnical Section, Environmental and Site Review Division, at **703-324-1720, TTY 711.**

Approved by: Michelle A. Brickner, P.E.
Acting Director, Land Development Services