CHOOSING THE RIGHT BMP

Capital investment or long-term operation and maintenance costs—who decides?

The question is not whether a storm water management best management practice (BMP) needs to be maintained—in order to ensure proper effectiveness, they all do. Rather, the questions are "How often?" and "How much will it cost?" The answers will differ depending on the type of BMP and the land use being managed.

When using relatively simple surface detention and retention basins with large storage components, answering these questions is often deferred because of the long and gradual maintenance cycle associated with the practices. The trade-off is the high capital investment in terms of land cost.

On the other hand, high-performing small-scale treatment systems for urban environments, such as media filters (including underground sand filters, bioretention filters, dry swales and a variety of proprietary filter systems), are very cost-effective when the recaptured value of the developable land is factored into the equation. Unfortunately, the questions of maintenance frequency and cost for these types of systems cannot be deferred because the lack of timely maintenance can lead to an immediate drop in performance and imminent system failure.

A standard for evaluating the performance longevity of storm water BMPs must be developed in order to best compare options. It is simply not enough to identify that the selected system can remove pollutants and therefore meet storm water requirements; there must also be an assessment of the performance longevity and life-cycle cost of the system by determining the design maintenance interval.

Consider a sand filter. Sand is an excellent filter media due to its fine particle size gradation, which also makes it susceptible to clogging. Thus, the design methodology is based on sizing the system such that it will meet the desired performance goals even when approaching the end of its design maintenance cycle. The problem is that there is no standard for determining how long it will take for the system to reach that point. If the site is unusually dirty or contains a high loading rate of oil, petroleum hydrocarbons or organic matter, the system will clog quickly. If the surface area of the filter is proportionately reduced by allowing a greater driving head as calculated using Darcy's Law, the system will clog sooner due to the higher specific flow rate and smaller surface area (gpm/sq ft) on which to trap and sequester pollutants.

Regulations must drive the decision-making process. To ensure a selected BMP achieves long-term water quality goals means considering the balance between the size (cost) and performance longevity of the system. The regulators have the final decision regarding performance specifications and sizing criteria, so they should also designate the minimum design maintenance cycle. Whether the BMP is a pond, rain garden or underground filter system, if it performs as designed, it will require maintenance and should be considered as an integral part of the design standards. SWS

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