

# Your Water, Your Future

by Dauphin County Conservation District

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## The Economics of Stormwater Management

The release of the Pennsylvania Stormwater Best Management Practices (BMP) Manual has sparked a great deal of interest amongst engineers, developers and contractors, who want to implement environmentally-sensitive development. One of the most frequently asked questions in regard to BMPs is, "How do they compare in cost to conventional development?" We have found that by evaluating a site and selecting BMPs that best suit its characteristics, costs are comparable to—and in some cases, less than—conventional storm sewer design and installation. Further, BMPs offer important ecological advantages over the long term for which it is difficult to assign an exact monetary value; these will be explored in the following sections.



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Please contact Gil Hirschel at 921-8100 regarding questions, comments, and requests for additional information.

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It has been said that money makes the world go round. It certainly is a key factor in the effective management of stormwater runoff. Although investing in adequate stormwater management can be expensive, ignoring the issue will cost a lot more in property damage, environmental degradation, drinking water costs, and lost revenue. Can effective stormwater management in your community be economical? You bet!

### Costs of Poor Stormwater Management

Inefficient stormwater management creates greater volumes of runoff flowing at higher speeds that can result in property damage and associated cleanup costs. The Pennsylvania Emergency Management Agency lists Pennsylvania, with its 80,000 miles of waterways, as one of the most flood prone states in the nation. That adds up to a lot of potential damage to municipal roads, bridges, parks, and other public



infrastructure. As mentioned in a previous issue of the newsletter, one Dauphin County municipality sustained damages totaling \$100,000 as a result of a particularly heavy storm. Additional costs to the community arise from cleanup of storm debris deposited on public property. However, implementing and maintaining a sound stormwater management strategy can reduce the high cost of impacts from additional runoff generated as a result of land development.

Budgeting for stormwater management can also indirectly reduce the potential for lost tax revenue. Streams, ponds, and lakes located within residential developments make strong marketing tools because people have a strong attachment to water. A study by the

National Association of Home Builders indicates that the proximity to water raises a home's value by up to 28 percent. This trend is not restricted to the residential housing market; the quality of the local environment is named as one of the prime location factors for commercial and industrial sites as well.

Of course, a reliable water supply is essential for the maintenance and growth of viable communities. The loss of stormwater infiltration and groundwater recharge can seriously threaten the drinking water supply, creating a need to develop costly new public water resources. A municipality that has a desire to grow economically and provide a high quality of life for its citizens can not afford to ignore these factors.

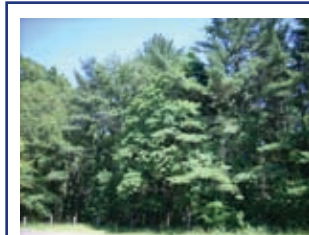
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## Economic Benefits of Effective Stormwater Management

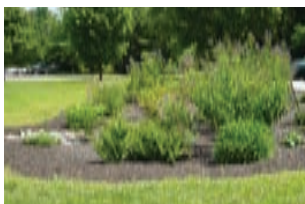
Experts in the field of stormwater management generally agree that the installation and long-term maintenance costs for stormwater Best Management Practices (BMPs) are less than those for conventional storm sewers. For example, conveyance of stormwater in a conventional storm sewer requires trench excavation, pipe installation, backfilling, grading, connectors, and inlets. The installation of a grass-lined swale BMP to convey the same amount of stormwater only requires some excavation, grading, and seeding. As you can imagine, the swale can be considerably less expensive to build than the storm sewer. In addition, the swale provides some infiltration and filtration, whereas the storm sewer provides none.

Non-structural BMPs, such as Open Space Preservation and Conservation Development, aim to maintain sections of undeveloped land within a development site. These BMPs save builders money in site preparation costs and require less of an investment in stormwater-related infrastructure.

Developers find that these properties often command higher prices than those in conventional-style developments. Studies show that open space developments garner premiums that are 5 to 32 percent higher than conventional subdivisions, and they sell or lease at a higher rate. Also, land cleared for construction produces as much as 2,000 times more sediment than forests and meadows.



*Vegetated areas keep runoff near the site, and reduce the amount of runoff contributed to local streams.*



*Rain Gardens, which infiltrate and remove pollution from runoff, are a cost-effective alternative to storm drains.*

Structural BMPs, such as rain gardens, not only cost less than storm sewers, but provide a host of benefits, such as reduced storm flows, water filtration, and infiltration. According to the Stormwater Managers Resource Center (SMRC), they cost about \$6.80 per cubic foot of water storage. They replace areas that would normally be landscaped, so the actual costs are less than indicated.

The SMRC also indicates that porous pavement, another structural BMP, infiltrates as much as 70 to 80 percent of annual rainfall, allowing it to recharge groundwater resources. Although the initial cost of porous paving is higher than conventional paving, the cost is offset when factoring in the additional cost of installing a storm drain system to handle the runoff created by the conventional paving.

Infiltration beds and trenches capture and store runoff, effectively reducing the peak volume of runoff flow leaving a site. The runoff retained in the basin or trench then seeps into the soil where it can recharge the groundwater level. Costs average about \$2.00 per cubic foot of storage; maintenance costs are typically about 5 to 10 percent of construction costs.



*Infiltration beds collect runoff for on-site storage and infiltration.*

Incorporating innovative BMPs in developments can also save valuable space. For example, many development projects install detention or retention basins to handle site runoff. Although these are effective options for reducing peak stormwater flows, they take up space that could be used for other purposes, such as BMP structures that offer additional water treatment benefits. Using BMP structures also provides the developer with greater income. Installing BMPs is advantageous for both the developer and community with quite a large bang for the buck!

### Municipal Actions

Healthy and economically viable communities benefit everyone – residents, business owners and the local government. By adopting a proactive approach to stormwater management, municipalities can avoid property destruction and costly repairs to infrastructure, while preserving the value of their community's natural resources.

Municipalities have the tools to avoid the heavy costs of inadequate stormwater management through well-written and adequately enforced stormwater management, subdivision, land development, zoning, floodplain and building ordinances. Municipalities should strive to work with the development community to assure compliance with stormwater regulations and ensure a commitment to employing the latest structural and nonstructural stormwater BMPs. Municipalities can reap the economic benefits of effective stormwater management rather than struggle with the increasing costs of inadequately managed stormwater. □

**Next Issue: Effective Stormwater Management In Action**