



Chester County Stormwater BMP Tour Guide
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BMP: Permanent Sediment Forebay

Site Name: Devonshire Residential Development (a.k.a., Kentsmere)

Location: East Whiteland Township, ADC Map Coordinates: 22-J8
Directions: Located on Westgate Circle off Swedesford Road (west of its intersection with Rt 401) (Westgate Circle on southside of Swedesford Rd.)

Watershed: Valley Creek (Stream Use Designation: EV)

Land Use: Residential Single Family

Description: A sediment forebay is a pond-like structure that pretreats stormwater runoff to remove pollutants, predominantly sand, dirt, and silt, before stormwater flows into the adjacent stormwater pond. The forebay is surrounded by constructed earthen berms on three sides and a riprap berm on a fourth side. The site's storm drainage system discharges stormwater into the forebay where it collects temporarily prior to flowing into the adjacent lined detention pond. Stormwater remains in the forebay for sufficient time to permit suspended solids to settle to the bottom. The riprap berm separating the forebay from the pond is constructed of gabion baskets (wire cage frames containing rock) which is buried about 5-feet into the basin walls to prevent its wash-out during periods of high flow. The forebay slopes gradually downward toward the gabion berm with a minimum slope of 2 percent. Both the forebay and the detention pond are lined with geotextile fabric liner to control sinkhole development since they are located in a karst region susceptible to sinkhole formation. The forebay and the basin will be planted once site construction is complete when they are converted to permanent structures.

Functions: This permanent forebay has been designed to remove sediment from the 2-year storm, or the "first flush" pollutants. A forebay primarily controls suspended solids pollutants, including sand, soil, grit, but can also filter oil and grease when these pollutants are bound to suspended particles. The forebay limits sediment accumulation in the adjacent detention pond, which minimizes dredging requirements for the larger pond. Functioning as designed, a sediment forebay may approximate pollutant removal efficiencies comparable to sediment trap or dry pond.

	<u>Dry Pond</u>	<u>Sediment Trap</u>
• Total Suspended Solids (TSS):	80 %	Near 90%-100% when properly functioning
• Total Phosphorus:	51 %	No Available Data
• Total Nitrogen:	33 %	No Available Data
• Metals (copper and zinc):	62 %	No Available Data
• Bacteria:	70 %	No Available Data

Operation and Maintenance: The Chester County Conservation District considers this structure to have moderate to high maintenance requirements. Operation and maintenance requirements include the following:

- Regularly inspect and maintain structure to ensure it is functioning properly
- Remove accumulated trash and debris as necessary
- Inspect gabion berm periodically to ensure its stability
- Exercise caution when working in/around the detention pond to protect its underlying liner and check it for sediment accumulation
- Protect lining to ensure it is not damaged by heavy or sharp equipment
- Mow semi-annually during the growing season to maintain vegetative cover in and around the forebay consistent with maintenance specifications
- Cleanout accumulated sediment consistent with designed storage capacity

Cost: The cost to construct a sediment forebay does not add significantly to the cost of constructing a conventional pond. Construction costs can be offset by its value in managing stormwater and the long-term cost savings resulting from the reduced maintenance requirements for the larger detention pond. The sediment forebay reduces cleanout and dredging requirements for the larger pond; however, it will require periodic cleanout.

Other Site BMPs

Temporary Faircloth Skimmer Device. This device is used as a temporary erosion and sediment control measure during site construction. The skimmer is designed to float on the surface of water stored in the basin. This skimmer device skims, or drains off, the top 6 inches of water from the surface through an opening in the plastic piping. This device skims off cleaner water from the water surface and prevents water with higher concentrations of suspended solids below from discharging.

For More Information

Owner: Kentsmere Developers, Doug Harts (610) 804-9362
Norcini Builders Inc., Jim Norcini, (610) 971-9100
Kentsmere Homeowner Association/East Whiteland Township

Designer: Chester Valley Engineers 610-644-4623 (John Carty)

References

Pennsylvania Handbook of Best Management Practices for Developing Areas. CH2MHILL. Spring 1998

Approaches to Stormwater Treatment, Watershed Leadership Kit Volume 4. Prepared by Center for Watershed Protection, Inc. Copyright 2001.

Site 4 - Devonshire Future Permanent Sediment Forebay (During Construction)



This photo shows the riprap berm in the basin that separates the forebay from the adjacent detention basin. Entering stormwater flows into the sediment forebay first before flowing through the riprap berm into the adjacent basin.