

# Retention Pond

The retention pond (or wet pond) is among the most common stormwater treatments used for flood control in the world. These ponds are generally comprised of a sedimentation forebay and a larger basin sized to hold the water quality volume (WQV). They retain larger storm volumes for 24 to 48 hours, which protects the channels (streams, etc.) that receive the effluent. They also can be designed to retain larger volumes generated by 10- to 100-year rain events.

Treatment occurs when particles settle along the flow path between the pond's inlet and outlet, and between storms

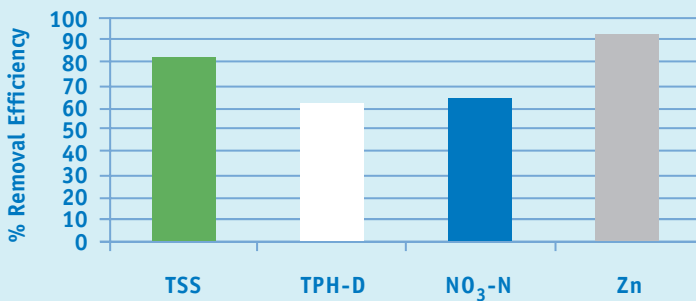
when additional settling occurs. Nutrient removal occurs between storms via plant uptake. Rain events provide a fresh influx of stormwater runoff, which forces standing water out of the system.

Maintenance requirements include the periodic removal of sediment and vegetation to restore storage capacity. Sediment removal occurs primarily in the forebay, which can be designed for easy equipment access.

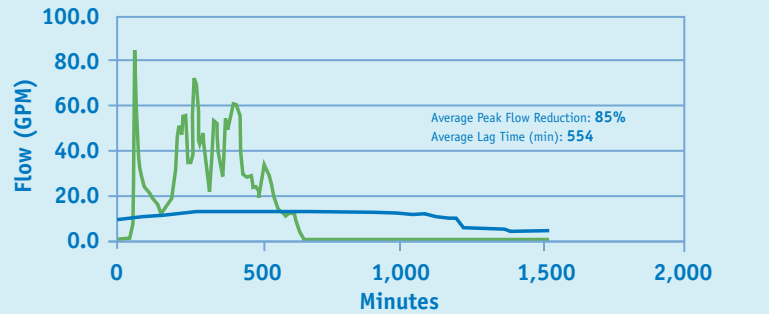


A pond's [left] water quality performance is a function of storage volume and retention time. Erosion control matting [center] protects slopes with a grade of 2:1 or steeper. Green water [right] is a sign of eutrophication, a water quality issue associated with retention ponds.

## WATER QUALITY PERFORMANCE



## PEAK FLOW REDUCTION



**Category Type**  
Stormwater Pond

**BMP Type**  
Structural Conventional

**Design Source**  
New York State Stormwater Management Design Manual

**Basic Dimensions**  
Overall: 46 ft X 70 ft (varies)

**Specifications**  
Catchment Area: 1 acre  
Peak Flow: 1 cfs  
Treatment Volume: 3,264 cf

**Treatment Function**  
Physical Settling/Biological

**Cost Per Acre**  
\$13,662.48

**Maintenance Data**  
Maintenance Sensitivity: Low  
Inspections: Low  
Sediment Removal: Low

## Water Quality Treatment Process

A retention pond's water quality treatment is a function of its large volume and high retention time, which allows for the physical settling of sediment. There are significant questions regarding the impact of retention ponds on water quality. Its ability to remove sediments—and nutrients when properly vegetated—is well documented. However, a pond may also present problems.

The human health risks associated with standing water include drowning and the creation of a habitat for mosquitoes that may carry disease. Nutrient-rich ponds also appear to be prime habitat for disease-causing bacteria, and elevated bacterial concentrations have been observed in retention ponds. In hot weather, ponds can superheat already warm parking lot runoff. Superheated effluent from retention ponds can impact small receiving streams, aquatic habitats, and fisheries that depend on cooler temperatures. Some innovative retention pond outlet designs include the use of gravel under-drains as a cooling mechanism.

