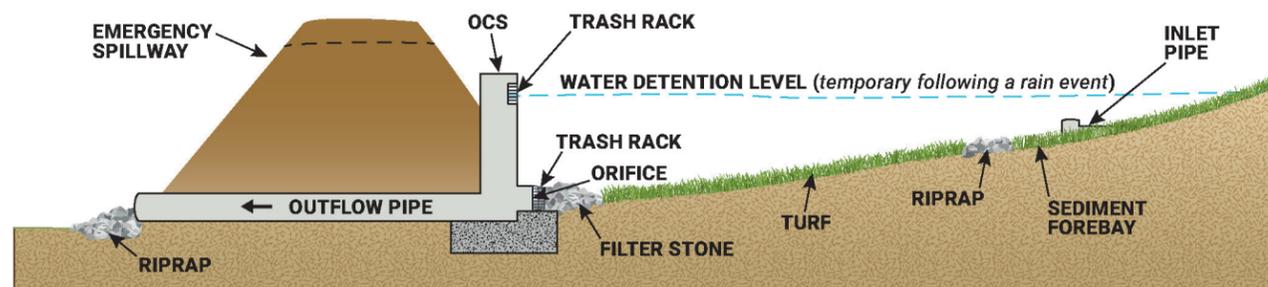


### DRY DETENTION BASIN EXAMPLE MAINTENANCE LOG

Schedule	Task	Description	To Be Performed By*	Date Performed
Weekly or biweekly with routine property maintenance	Forebay inspection	Remove accumulated sediment once forebay volume is reduced by approximately 50 percent.	O S	
	Inlet/outlet inspection	Remove litter, leaves, and other debris to reduce the risk of clogging and to improve aesthetics.	O S	
	Nuisance species removal	Remove invasive and nuisance plants. Contact qualified wildlife management professionals to control nuisance wildlife if needed.	V W	
Monthly during growing season, then as needed	Mowing	Mow embankment and side slopes, and remove clippings from the basin. Mowing may need to be performed more frequently during growing season.	O V	
Annually	Basin inspection	Remove accumulated sediment. Regrade adjacent pervious areas if necessary to reduce sediment entering the basin. Repair and revegetate undercut and/or eroded areas.	O S	
	Embankment inspection	Repair and revegetate eroded areas. Inspect the embankment for structural integrity.	S V	
	Vegetation replacement	Remove and replant dead vegetation. Plant die-off is typically highest during the initial year. Plant survival increases with time.	O V	
	Structure inspection	Inspect structures (inlet, outlet, OCS, etc.) and perform any necessary structural repairs.	O S	

\* O owner S structural maintenance professional V vegetation professional W wildlife management professional



Example Dry Detention Basin Profile (not to scale)

# DRY DETENTION BASIN



## WHAT IS A DRY DETENTION BASIN, AND WHY DO WE HAVE ONE?

A dry detention basin is a type of stormwater BMP that captures stormwater runoff temporarily to reduce downstream flooding and remove pollutants.

**Key features of a dry detention basin include:**

- The dam, or **embankment**, impounds water to reduce downstream flooding.
- A **sediment forebay** slows incoming stormwater runoff and allows sediment to settle out.
- The **outlet control structure (OCS)** contains a low flow opening, or orifice, that controls the flow of water out of the basin. In the event of heavy rain, the OCS also includes a high-flow opening that allows water to bypass the basin and prevent the embankment from overtopping.
- The **bottom** of the dry detention basin is gradually sloped towards the outlet to allow water to drain out of the basin and prevent standing water. **Vegetation** (typically turf grass) helps provide some water quality benefit, stabilizes soil in the dry detention basin, improves aesthetics, and can also provide recreation opportunities.
- **Riprap** is installed at the forebay to slow down runoff and filter sediment, debris, and other solids from runoff.
- **Filter stone** is typically installed in front of an OCS to filter sediment, debris, and other solids from runoff.

Dry detention basins are designed to completely drain following a storm event and are normally dry between events. If your basin retains water for more than 48 hours after the last rain event, there may be a problem.

STORMWATER BMP MAINTENANCE FOR HOMEOWNERS' ASSOCIATIONS & PROPERTY MANAGERS

## Why should we maintain our dry detention basin?

**Failure to maintain a dry detention basin can lead to structural failure and expensive repairs.**

Without proper maintenance, dry detention basins will not provide their intended flood control and water quality functions. Poorly maintained or failing dry detention basins can pose a risk to public health and safety.

Failure to maintain dry detention basins can also lead to nuisance conditions including mosquito habitat, odors, and undesirable aesthetics (e.g., stagnant water, overgrowth of vegetation, trash accumulation, etc.).

## Who is responsible for maintaining our dry detention basin?

**Property owners are legally responsible for ensuring that the dry detention basin on their site is properly inspected and maintained. Owners could face enforcement actions and incur liabilities if the BMP fails.**

The **Maintenance Agreement** for your dry detention basin includes valuable information for inspection and maintenance of your basin, including who is responsible for maintenance.

It's important to remember that **landscapers are not typically trained specifically for BMP maintenance**. The company performing the work must understand the purpose and function of the dry detention basin and strict maintenance requirements. Best practices for landscapers include:

- Mow basins at a higher level (turf should be about 6 inches tall).
- Do not use heavy equipment, especially inside the basin.
- Keep all landscaping debris (e.g., grass clippings) out of the basin.
- Avoid the application of pesticides and fertilizers.

Source: Lake County, Illinois Stormwater Management Commission

## When should we maintain our dry detention basin?

**Most maintenance problems with BMPs are less costly to correct when they are caught early. Therefore, the importance of regular inspections and routine maintenance cannot be understated.**

Dry detention basins should be inspected at least quarterly and after large storm events (i.e., greater than 1 inch of rainfall).

Common maintenance indicators for dry detention basins include:

- Heavy sediment buildup
- Trash, litter, and debris accumulation
- Clogged inlet and outlet structures
- Broken, cracked, or separated structures
- Stagnant water (dry detention basins should be dry between storms)
- Poor vegetation health or no vegetation at all
- Areas of erosion, scour, or bare soil
- Odors and poor appearance
- Trees or shrubs growing on the embankment or near OCS

- Animal burrows
- Presence of wetland vegetation, such as cattails

## How do we maintain our dry detention basin?

**A well-designed maintenance program includes both "routine" and "non-routine" maintenance tasks.**

Routine maintenance includes regularly scheduled tasks that are necessary to maintain the function and desired appearance of a dry detention basin. This includes:

- Performing regular inspections
- Mowing vegetation in and around the basin
- Prevent small trees and shrubs from growing
- Removing minor sediment deposits from the forebay
- Removing trash and debris
- Clean/replace riprap around forebay
- Clean/replace filter stone around OCS

Non-routine maintenance consists of more difficult or complex maintenance tasks that are typically performed on an as-needed basis after a regular inspection identifies a problem. This can include:

- Repair and stabilization of eroded areas
- Removal or excavation of accumulated sediment
- Repair or replacement of structures
- Identification and removal of undesirable vegetation
- Removal of large woody vegetation
- Identification and repair of structural deficiencies in embankment
- Repair of animal damage and animal removal
- Review joints and replace grout as necessary

**The example checklist on this fact sheet outlines recommended inspection and maintenance tasks.**

## Paying for maintenance

**Annual routine maintenance** typically costs between \$1,000 and \$3,000 (2019 dollars) per dry pond, depending on acreage and complexity of maintenance tasks. Frequent routine maintenance can help prevent major, expensive repairs caused by lack of maintenance.

**Non-routine maintenance** costs can be significant when they occur. To lessen the financial impact, a maintenance fund should be established and annual contributions made to spread the cost out over multiple years.

For dry detention basins, which need **sediment removal** every two to ten years (or when sediment fills 25 to 50 percent of the storage volume), 10 to 50 percent of anticipated dredging costs should be collected annually.

The cost of sediment disposal must also be considered. If on-site disposal is not an option, transportation and landfill tipping fees can greatly increase sediment removal costs.

In addition, the average dry detention basin has a life expectancy of 20 to 50 years. A separate fund that collects two to five percent per year should be established for **replacement**.

Dry detention basin structural components will also need to be replaced over time until eventual facility replacement. Components that should be financed over time include pipes, trash racks, concrete (i.e., riser) structures, and embankments.

Source: Northern Virginia Regional Commission, 2007

## How can homeowners help?

**There are many actions that you can take on your own property to help reduce pollution from stormwater runoff, prolong the life of your dry detention basin, and reduce maintenance costs.**

The back of this folder accompanying this sheet contains some valuable information on easy steps homeowners and property owners can take — see **"BMP education tips."**

**Homeowners and property owners can also play an important role in conducting regular inspections, performing routine maintenance tasks, and helping identify changes in your dry detention basin that could be signs of a problem.**

The best way to involve the community in stormwater management is through **education**. Below are some suggestions for community involvement and education:

- Teach residents that storm drains lead directly to the dry detention basin or stream.
- Organize a clean-up day and use it to teach residents simple ways that they can help maintain the community's dry detention basin.
- Contact local organizations for resources, technical support, and help developing a public education program or hosting an event.
- Work with a professional to train homeowners on how to properly perform basic inspection and maintenance tasks.

## When should I call a professional?

**Drastic changes in dry detention basin performance or appearance are signs that it's time to call a professional.**

Regular inspections will help identify changes early on before they become serious (and expensive!) problems. Involving a professional in some of the more routine and regularly scheduled inspections and minor repairs will help prevent serious issues from developing over time. Professionals should be consulted for the following:

- For vegetation needs call:
  - A professional landscaper
  - A horticulturist or other plant professional
- For maintenance and repair needs call:
  - A licensed contractor
  - A professional engineer
  - A business certified in BMP Maintenance

## Dry detention basin safety considerations

Important safety considerations for dry detention basins include:

- Steep embankments
  - These can make it difficult to climb out of the basin, and can be hazardous to maintenance staff.
- Inlet and outlet structures
  - Outlet structures that are open and unprotected by trash/safety racks pose a danger.

- Outlet structures should always be equipped with these features, and they should be in proper working order.
- Only professionals with specialized training and permits may enter confined spaces and structures.
- General safety tips
- Avoid performing maintenance activities in wet weather.
- Maintenance staff must wear appropriate safety gear.
- Maintain lighting, signage, and fencing, where appropriate, to discourage public access.

Source: University of Wisconsin Extension

## Beaver and mosquito control for dry detention basins

Beaver activity can cause costly damage. Beavers block outfall areas leading to flooding, and can also burrow into embankments and cause erosion and failure.

**To control animal burrowing, fill existing burrows as quickly as possible. Regular inspections can help identify burrows before they cause serious structural problems in a dry detention basin.**

Keeping woody vegetation from growing on the embankment or in the basin can reduce beaver activity. Once beavers are in your basin, trapping is the best method to remove them.

Source: Solitude Lake Management

**When designed and maintained correctly, dry detention basins are not typically a breeding ground for mosquitoes.**

Dry detention basins are designed to retain water for up to 48 hours; however, it takes at least 1-2 days of stagnant conditions for mosquito eggs to hatch and several more days for larvae to grow into adults.

Often the number of mosquitoes in an area can be reduced by removing sources of standing water, such as clogged roof gutters and downspouts, old tires, open trash cans, and bird baths.

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