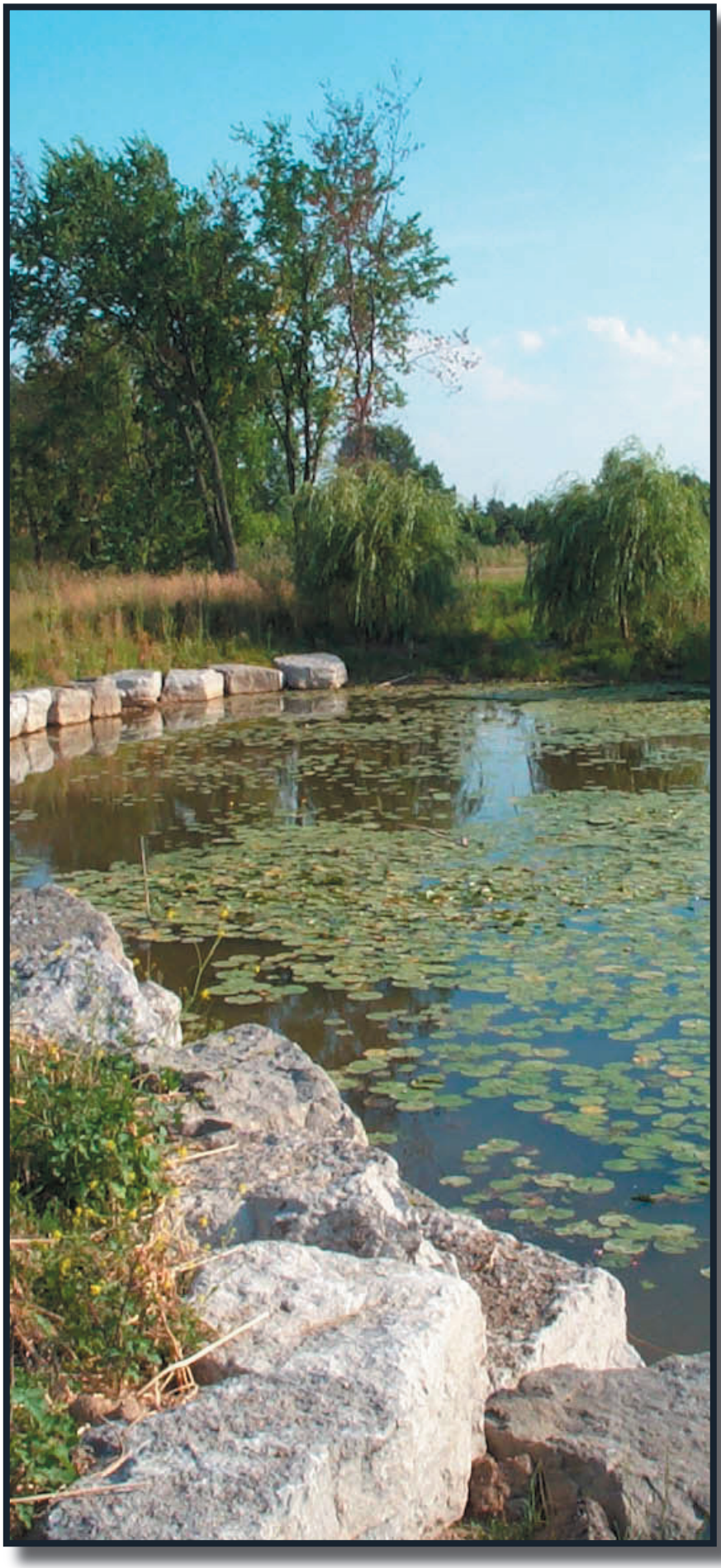

Maintaining Your Detention Basin

A Guidebook for Private Owners in Southeast Michigan

Assembly of Rouge Communities

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Prepared by the Public Involvement and Education Committee of the Assembly of Rouge Communities.
All photos provided courtesy of Environmental Consulting & Technology, Inc.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grant #XP995743-01 through -08 and #C995743-01. The views expressed by individual authors are their own and do not necessarily reflect those of EPA. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying, official EPA approval, endorsement, or recommendation.

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Additional information regarding detention basins and water quality maybe obtained from your local community or county. Also visit www.rougeriver.com.

Introduction

Your detention basin is a storm water Best Management Practice (BMP) designed to reduce the impacts of pollutants and increased storm water on local streams caused by development. They are an essential part of southeastern Michigan's efforts to improve the quality of our streams, rivers, and lakes; however detention basins will fail prematurely if not properly maintained. Once a detention basin fails, it will no longer perform its intended function and it is often very expensive to replace.

- **What are detention ponds and why are they important?**
- **Do you have a detention pond near your property?**
- **Are there different types of detention ponds?**
- **Are you responsible for maintenance?**
- **Maintenance? Why is it necessary?**
- **What maintenance tasks should be considered?**
- **How can you enhance the appearance and function of your detention pond?**
- **What does it mean to naturalize your detention pond?**
- **Wildflower buffers? Bird Boxes? Wildlife enhancements?**

Whether you are an individual property owner, a home owners' association representative, or a residential/commercial property manager, this Guidebook will answer all of these questions and provide you with step-by-step instructions for maintenance activities. Routine maintenance will prolong the life of your detention pond, improve its appearance, prevent flooding and property damage and enhance local streams and lakes. This Guidebook is not a set of rules and regulations on how to design or build a detention basin.

What are detention ponds and why are they important?

When land is altered to build homes and other developments, the natural system of trees and plants over relatively spongy soil is replaced with harder surfaces like sidewalks, streets, decks, roofs, driveways, and even lawns over compacted soils. As a result, less rainwater is soaked up and more rain water/ storm water flows off the land at a faster rate. This can lead to streambank erosion within the local streams and possible downstream flooding.

In addition, there are increased concentrations of pollutants in storm water/drain water (called nonpoint source pollution). These pollutants include sediment, phosphorus and nitrogen from fertilizers, salts, and oil/ grease from roads and parking surfaces, and bacteria from pet waste. These pollutants, which are a direct result of a variety of common outdoor human and animal activities in the neighborhood, degrade water quality and limit the habitat for wildlife in the stream. Every storm water detention basin located in the communities of southeastern Michigan plays an important role in improving and protecting water quality.

Your detention basin (along with others in the area) helps to slow the rate of runoff from the neighborhood and improve the quality of the storm water leaving the detention pond. They are important in protecting public and private property, public health and safety, and water quality. The basin collects and traps sediment from storm water that would otherwise end up clogging our rivers and streams and degrading the environment for fish, birds, and other wildlife.

The establishment of wetland vegetation within your basin as well as the creation of vegetated buffers or no-mow zones around the basin will help to improve water quality by filtering pollutants in storm water. This , in turn, helps to reduce algae growth within the basin and in downstream rivers, lakes, and streams. Reducing pollutants that may get to the basins is important in protecting water quality. Excess nutrients, including nitrogen and phosphorus, encourage algae growth. If fertilization of private property is necessary, then only use the low-phosphorus, slow release varieties. If you have a detention basin or other BMP, you are not alone. A variety of laws, including the federal Clean Water Act, encourage or require the control of urban pollutants. As such, maintaining your BMP is an important part of Michigan's environmental protection efforts.

Do you have a detention basin near your property?

If your development was built after the mid-1980's, you may have a detention basin that manages storm water runoff. If you live in a residential community, your association bylaws or master deed may indicate the location of any detention basins. If you are unsure, then contact your local community's public works department.

Are there different types of detention basins?

Yes there are. Some detention ponds are dry and have mowed turf grass in the bottom of them. These basins are referred to as dry basins.

Some detention basins are primarily dry, but have a narrow concrete channel for water flow from the inlet to the outlet.

Newer detention ponds are designed to have a permanent pool of water and are commonly called wet ponds. These wet ponds store water throughout the year, but also fill with storm water after rain events, but allow the water to exit to a neighboring storm sewer or creek through an outlet structure. If a detention pond does not have an outlet, then it is called a retention basin. Water that collects in retention basins must infiltrate into the ground or evaporate.

The advantages of a wet pond over a dry pond are higher pollutant removal efficiencies and less chance that pollutants will be re-suspended during a storm. Wet ponds can also serve as an aesthetic or recreational amenity as well as habitat for some wildlife.

All detentions basins will collect and fill with rain water or storm water runoff during and after rain events. Because there are several categories of detention basins, understanding the type of detention basin you have will help to better plan for its maintenance needs. Contact your local public works department for more information regarding your specific detention basin.

Are you responsible for detention basin maintenance?

We are all responsible for protecting water quality. Responsibility for maintenance varies across southeast Michigan. However, if your home owners' association or business is subject to a maintenance agreement, most likely you are the responsible party. It is important to check your maintenance agreement to identify your specific legal obligations. If you are not sure who is responsible for maintenance, contact your local community's public works department.

What maintenance tasks should be considered?

A consistent maintenance program is the best way to ensure that a detention basin will continue to perform its water quality and flood control functions. The first step in a maintenance program is to obtain a copy of the detention basin plan from your local engineering or public works department to determine how your basin was designed to function. In general, a maintenance program should contain the following components:

- regular inspections;
- review by a licensed Professional Civil Engineer;
- vegetation management;
- embankment and outlet stabilization;
- debris and litter control; and
- sediment/pollution removal.

The remaining sections of this Guidebook focus on describing the maintenance tasks required for proper basin function as well as frequency of various tasks. The following categories of maintenance tasks are further described in this Guidebook:

- storm sewer system and structural components;
- vegetation management;
- wildlife and insects; and
- property management activities that benefit your pond.

It's important to keep records of all inspections, maintenance activities, repairs and associated costs. A table has been provided at the back of this Guidebook for your use to assist in documentation (Detention Basin Inspection and Maintenance Record). Finally, before starting any maintenance activities, check with your local public works department to determine what, if any, permits are necessary.

Maintenance Tasks: storm sewer system

The storm sewer system includes pipes, catch basins and the outlet structures that enter and exit the detention basin. It is important to regularly inspect the structural elements (inlet/outlet pipes and animal grates) of your detention basin in order to ensure that storm water is flowing in and out of the pond as originally designed. Debris and sediment commonly clog detention basins and reduce the pond's overall effectiveness.

The following maintenance and inspection tasks should be included for the structural basin components: (also see Detention Basin Inspection and Maintenance Record located at the end of this Guidebook.

1. **Inspect the inlet pipes and outlet pipes for structural integrity. (Annually)** Check inlet/outlet pipes for structural integrity to ensure they aren't crumbling or broken.

2. **Inspect riprap at the inlet pipes. (Annually)** Replace when the riprap is clogged with sediment and debris.

3. **Conduct routine inspections for trash or other debris that may be blocking the inlet or outlet pipes or emergency spillway. (Monthly and after rain events)** Remove all trash and debris from the basin. Improperly maintained ponds can harbor breeding area for mosquitos and reduce the storage volume of the pond.

4. **Inspect and clean the storm sewer system and catch basins upstream from the detention basin. (Every 5 years or as needed)**

5. **Inspect for sediment accumulation at the inlet pipes. (Semiannually and after rain events)** It's important to clean out sediment that might be restricting water flow. Remove accumulated sediment with a shovel and wheelbarrow if it is blocking water flow. Small amounts of removed sediment can be spread evenly on upland areas and seeded with natural vegetation.

6. **Inspect the stone around the riser/standpipe (outlet pipe). (Semiannually and after rain events)**
   If stone has accumulated sediment, vegetation and/or debris to an extent that water is not flowing through the stone and out of the pond as originally designed, then the stone should be replaced with clean 3" diameter stone choked with clean 6A stone.

7. **Inspect for excess sediment accumulation in the pond (Annually)** Remove every 5-10 years or when the sediment accumulation is more than 6-12".

8. **Have a Professional Civil Engineer inspect the pond to ensure it is functioning properly. (Annually)**
   Compare existing conditions to as-built engineering plans.

Maintenance Tasks: vegetation management

Many detention basins rely on vegetation to filter sediment from storm water before it reaches the outlet of the basin and to prevent erosion of the banks and the bottom of the basin. Turf grass is the most common ground cover - although many BMPs use woody vegetation (rain gardens) and wetland plants (wet ponds) to increase pollutant removal efficiencies.

In the spring and fall, inspect the vegetation along the side slopes/banks and in the basin. In the spring, dead cattails and other decomposing vegetation in the basin should be removed if they are clogging pipe openings. Eroded areas should also be repaired to minimize sediment entering the basin.

Water Lilies

Arrow Arum

A variety of wetland vegetation species that may be growing or that you may plant in your detention basin will enhance the overall aesthetic appeal and reduce algae growth. The creation of a vegetated "no-mow" zone (15' to 25') around the basin will also help reduce the amount of nutrients such as nitrogen and phosphorus entering the basin, and ultimately reduce algae growth in the pond. Wetland vegetation that may be found (or planted) in your basin includes water lilies, arrow arum, pickerel plant, bulrush, sweet flag, swamp milkweed and joe-pye weed. Sample photos shown in this section may assist in identifying the variety of plants.

Bulrush

Pickerel Plant

The following maintenance and inspection tasks should be included for proper vegetation management: (also see Detention Basin Inspection and Maintenance Record located at the end of this Guidebook):

Joe-Pye Weed

1. **Reestablish permanent native vegetation on eroded slopes. (Annually in the spring and after rain events)**

2. **Maintain 15-25 foot "no-mow and chemical free" zone around the pond edge. (Annually)**

3. **Mow or burn the "no-mow" buffer zone once a year to a minimum height of 6". (Annually in late April/ early May)** Rake mown material off and compost, burn or discard.

4. **Inspect basin and "no-mow" zone for invasive species such as purple loosestrife, phragmites, buckthorn (common & glossy), honeysuckle and autumn olive that out-compete native vegetation. (Annually - July)**

5. **Have a professional selectively remove invasive species with applications of appropriate herbicides. (Annually - July/August)**
   If woody debris is cut, cut 4" above the ground surface and treat the stumps with herbicide immediately after cutting. Monitor for sucker growth.

Buckthorn (common)

Autumn Olive

6. **Purple loosestrife flower heads can be clipped off to reduce seed production until plant removal may be achieved.** Pulling purple loosestrife is not an effective removal method. Pulling purple loosestrife may actually encourage plants to multiply. Herbicide application of plants is the most efficient method. If stands of loosestrife are dense, it may take several years of maintenance to eliminate the plants from the site. Apply one round of herbicide in mid-July. Reassess the site three weeks after application to ensure all plants have been treated successfully. Apply additional herbicide treatment as necessary.

7. **Increase plant diversity. (Annually - fall or early spring)** Purchase native seed mix and wetland vegetation from a native plant nursery and install plantings in the early spring or fall. Increasing pant diversity in your basin will enhance water quality, minimize algae blooms and encourage habitat for birds, frogs & toads and other wildlife.

   Native vegetation and seed mixes may be purchased through a number of plant nurseries. Contact your local public works department for a list of various suppliers and contractors.

Maintenance Tasks: wildlife and insects

Detention ponds that are properly maintained will consist of a healthy, balanced animal community that may include birds, mammals, fish and insects. Opportunities for creating habitat in and around detention basins should be evaluated in conjunction with annual maintenance activities in order to support a balanced ecosystem. Unhealthy ecosystems may occur in basins that are not maintained and can lead to unbalanced populations of nuisance animal species. Common topics relating to wildlife and insects are described as follows:

1. Wildlife Enhancements.

Installing bird boxes around basins and stocking fish in detention basins are common alternatives for enhancing wildlife and creating balanced ecosystems. Contact your local community for more information.

2. Mosquitos and West Nile Virus.

Overpopulation of mosquitos may occur in detention ponds that are not functioning properly and are not maintained. Many alternatives exist for managing mosquito populations including the use of natural predators. In addition, many local communities and local health departments have West Nile Virus programs. Contact your local agency for more information regarding individualized programs.

3. Nuisance Geese.

Canadian geese have experienced huge population increases throughout the state and are commonly attracted to lawns that are mowed, fertilized and regularly watered. The following activities will help minimize the presence of geese in and around your detention ponds:

- Do not feed the geese. Feeding the geese leads to large numbers of geese congregating for free food that, in turn, makes controlling the population around your detention pond more difficult. In addition, goose droppings may increase the levels of fecal coliform in the detention pond.
- Establish vegetated buffers around your detention pond as described in the Vegetation Management section of this Guidebook.
- Create fence barriers at least 30 inches in height to exclude the geese from the turf areas.
- Contact your local public works department or the Michigan Department of Natural Resources for more information.

Maintenance Tasks: property management

Property management refers to specific activities that you as a property owner can do to enhance the detention basin and minimize long-term maintenance. A number of these activities are described as follows:

1. **Do not use pesticides, herbicides, or fertilizers in your pond.**
   These products will leach from the pond and pollute our streams and rivers. In addition, these chemicals are harmful to wildlife, including frogs, toads, fish, dragonflies, etc. in the pond.

2. **Do not place yard waste such as leaves, grass clippings or brush in the detention pond or in the storm drains located in the streets.** These materials release excess nutrients as they decompose and will lead to more algae growth in the pond.

3. **Do not dump any materials in the storm sewer system.**
   Improperly disposed of materials will pollute the basin.

4. **Consider contracting with a street sweeping company to minimize excess sediment from entering your storm sewer system and detention basin**. This can reduce the need for future pond maintenance.

5. **If you must use fertilizers, only use low-phosphorus, slow-release varieties.**
   Keep fertilizers on the lawn and not on paved areas.

6. **Pick up and dispose of pet waste with your weekly garbage.**

7. **Provide educational updates to the property owners**. Discuss your maintenance plan at regular meetings, provide information in newsletters, and host annual clean-up days.

Detention Basin Inspection & Maintenance Record

Task	Inspection Frequency	Year _____		
		Contractor (Name & Phone #)	Cost	Notes
Storm Sewer Systems				
Inspect the inlet pipes and outlet pipe for structural integrity	Annually			
Inspect riprap at inlet pipes	Annually			
Conduct routine inspections for trash or other debris that may be blocking the inlet tor outlet pipes or emergency spillway	Monthly and after rain events			
Inspect and clean the storm sewer system and catch basins upstream from the detention basin	Every 5 years or as needed			
Inspect for sediment & trash accumulation at the inlet pipes	Semiannually and after rain events			
Inspect the stone around the riser/standpipe (outlet pipe)	Semiannually and after rain events			
Inspect the riser/standpipe cover for trash and debris	Monthly and after rain events			
Inspect for excess sediment accumulation in the pond	Annually			
Remove accumulated sediment at basin inlets or in basin forebay	Semiannually and after rain events			
Have a Professional Civil Engineer inspect the pond to ensure it is functioning properly	Annually			
Have a Professional Civil Engineer inspect all outlet control structures to ensure they are functioning properly	Annually			

Detention Basin Inspection & Maintenance Record

Task	Inspection Frequency	Year _____		
		Contractor (Name & Phone #)	Cost	Notes
Detention Basin Vegetation				
Inspect side slopes, berms and spillways for erosion	Annually and after rain events			
Reestablish permanent native vegetation on eroded slopes	Annually and after rain events			
Maintain 15-25 foot “no-mow and chemical-free” zone around the pond edge	Annually			
Mow (or burn) the “no-mow” buffer zone once a year	Annually - late April/ early May			
Inspect basin and “no-mow” zone for invasive species such as purple loosestrife, phragmites, buckthorn (common & glossy), honeysuckle and autumn olive that out-compete native vegetation	Annually - July			
Have a qualified professional selectively herbicide invasive species	Annually July/August			
Increase plant diversity by planting additional vegetation in around the pond	Annually fall or early spring			
Property Management				
Common area maintenance	Annually			
Street sweeping	Semiannually			
Inspect basin for signs of chemicals (solvents, gas, diesel, paint, natural gas). Identify and remove/dispose of properly	Monthly and after rain events			
Review maintenance plan	Annually			