



# Privately-Owned Stormwater Management Systems

Operation & Maintenance

1/12/2023

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## Federal Clean Water Act



- ❑ US Environmental Protection Agency requires each state to identify water bodies that are not 'fishable or swimmable'
- ❑ Each state also needs to identify the pollutants causing the water body impairment

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# Pollutants Causing Impairment



**Sediment**

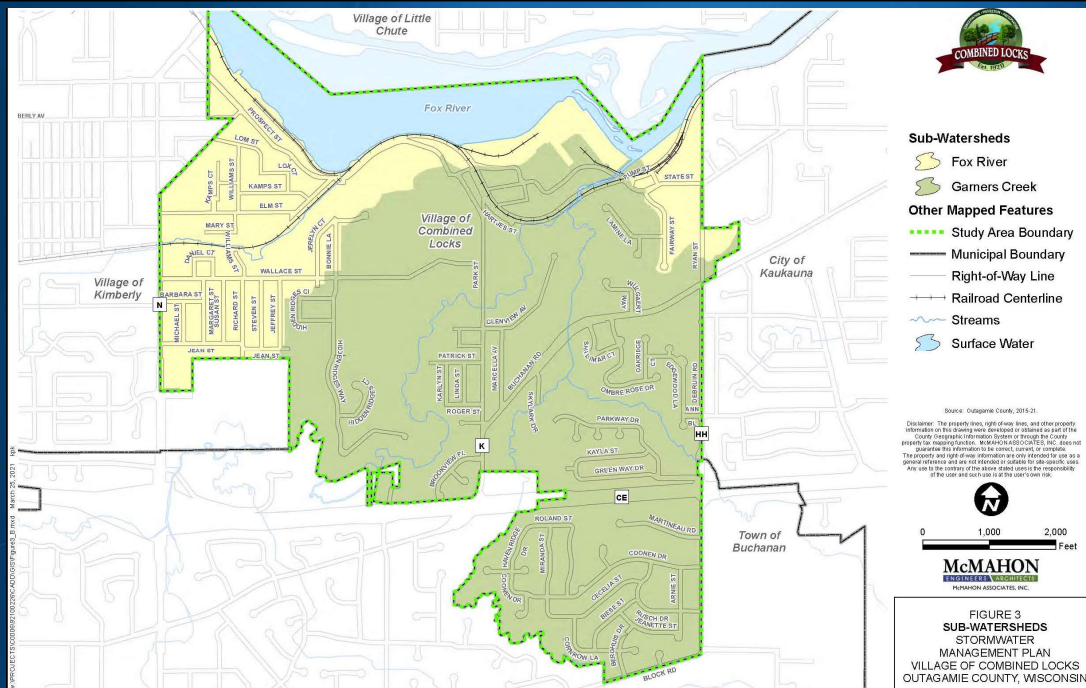


**Phosphorus**

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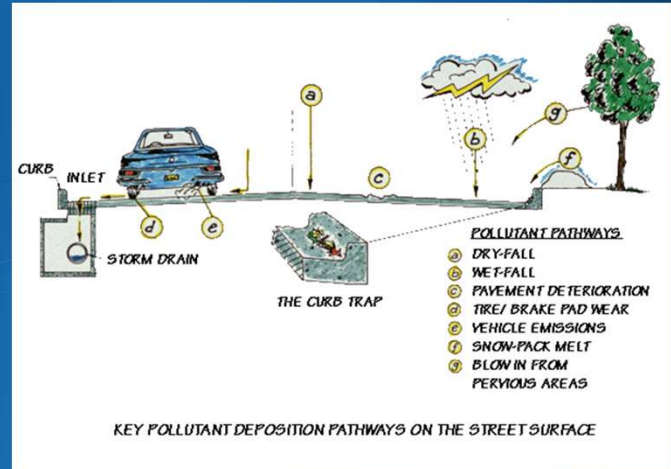


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The **McMAHON** Way...values. culture. Relationships, since 1909.

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# Stormwater Pollutant Pathways



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# Municipal Stormwater Permit

- ❑ Public Education
- ❑ Public Involvement
- ❑ Illicit Discharge Detection & Elimination
- ❑ Construction Site Pollutant Control
- ❑ Post-Construction Stormwater Management
- ❑ Municipal Pollution Prevention
- ❑ Stormwater Quality Management



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# Post-Construction Stormwater

## □ Wisconsin DNR & Village Requirements:

- Comply with stormwater quality, peak discharge, infiltration, protective area, and petroleum sheen requirements
- Obtain a permit for the stormwater system design
- Construct the stormwater system
- Inspect, operate, and maintain the stormwater system
  - Responsible Party (landowner)
  - Operation & Maintenance Plan (how to manual)
  - Landowner confirms to Village that maintenance was completed (annually)
  - Village audits the landowner's efforts (inspections)



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# Debris & Litter



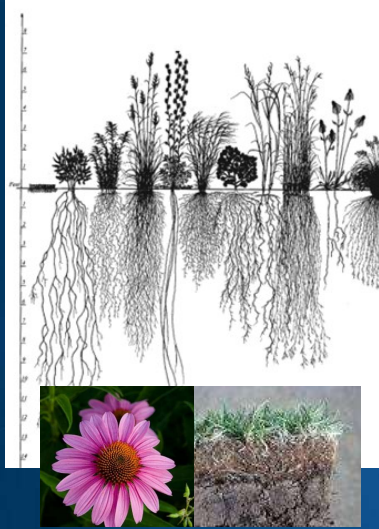
## □ Maintenance:

- Inlets
- Outlets
  - Trash racks
  - Orifices, weirs,
  - Channels, pipes, spillways
  - Filter or soil surfaces
- Other Areas
  - Open water, shoreline, vegetation



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# Vegetation



- Maintenance:
  - Vegetation Health & Density
  - Mowing Height (swales)
  - Noxious Weed Growth
  - Unauthorized Growth (trees)
- Filtration and infiltration devices benefit from deep rooted plants

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# Wildlife



- Maintenance:
  - Muskrats
    - Burrow holes in embankment, liner, etc.
  - Fish
    - Do not stock ponds
    - Carp can uproot wetland plants and stir up bottom sediment
  - Birds
    - Geese can damage wetland plants and degrade water quality
    - Large birds near airports are a hazard

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# Erosion



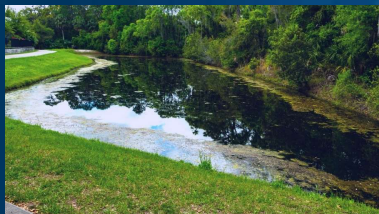
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- Erosion Types:
  - Channel, Rill, Scour, Shoreline
- Maintenance:
  - Topsoil, seed, fertilizer, mulch
  - Erosion mat (channels, slopes)
  - Turf reinforced mat
  - Riprap with geotextile fabric
  - Dense wetland planting (shoreline)

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# Aesthetics & Pollutants



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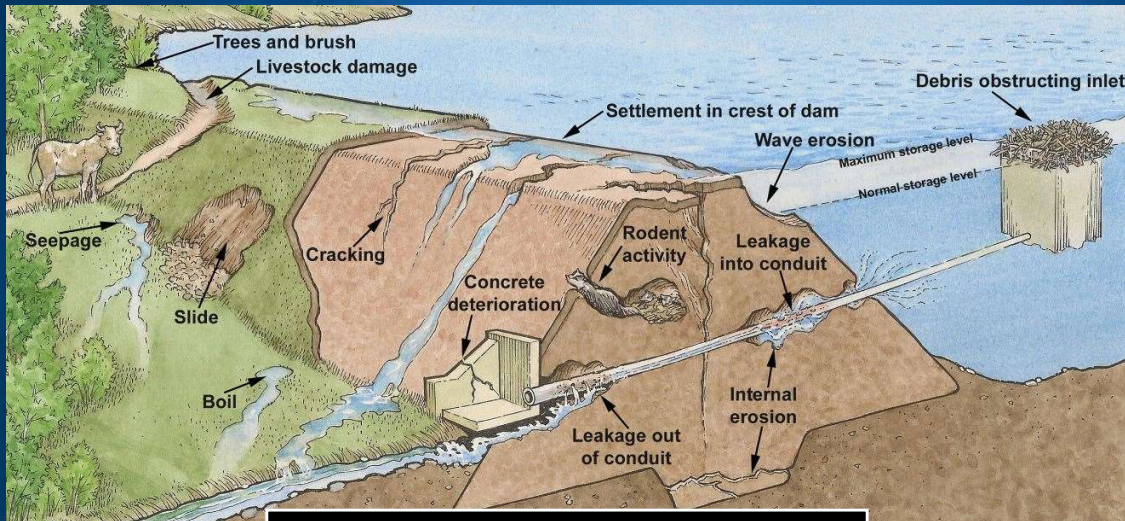


- Maintenance:
  - Algae if an aesthetic concern
    - Remove with skimmer
    - Hide with shoreline wetland plants
    - Aerator or fountain (approval needed)
    - Chemicals (approval needed)
  - Graffiti on concrete structures
  - Potential Pollutants
    - Illicit discharge
    - Illegal dumping

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# Structural



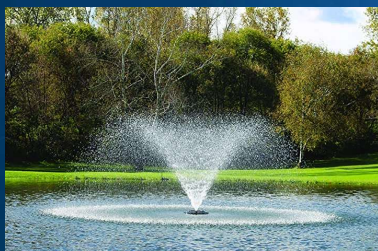
**Embankments, Dams, Spillways, Liners**

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# Wet Detention Pond (1001)



## □ Maintenance:

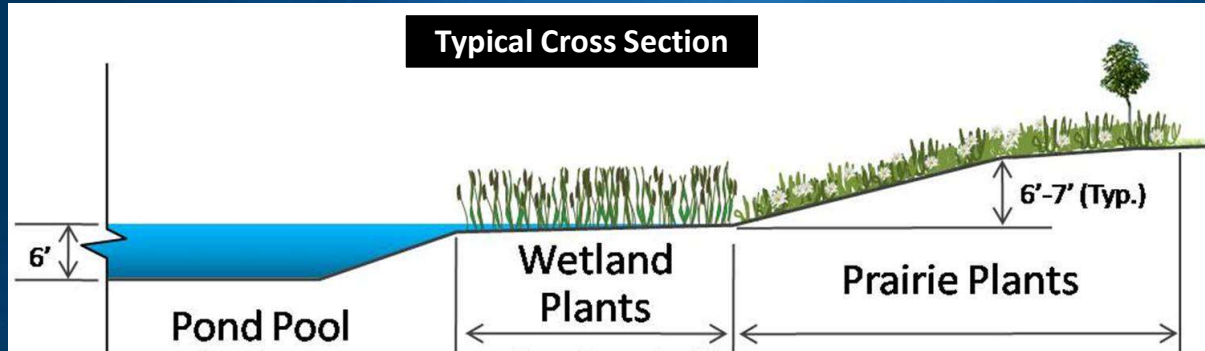
- Debris, Vegetation, Wildlife, Erosion
- Structural
  - Embankments, dams, spillways, pipes, etc.
  - Clay or synthetic liner
- Sediment Accumulation
  - Wet Pond - Permanent pool < 3.5 feet water
  - Dry Pond – Storage volume reduced > 10%
  - NR 528 sediment testing before disposal
- Aerator or Fountain
  - Approval needed

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# Wet Detention Pond (1001)



- Sediment Accumulates in Pool of Water
- Wetland Plants Reduce Shoreline Erosion
- Prairie Plants Reduce Mowing Effort

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# Bioretention (1004)



## □ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
- Surface Mulch (replenish, not too thick)
- Structural (standpipe, underdrain, filter)
- Sediment Accumulation
  - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
  - Surface water > 24 hrs after 0.5" rain
  - Subsurface water > 72 hrs after 0.5" rain

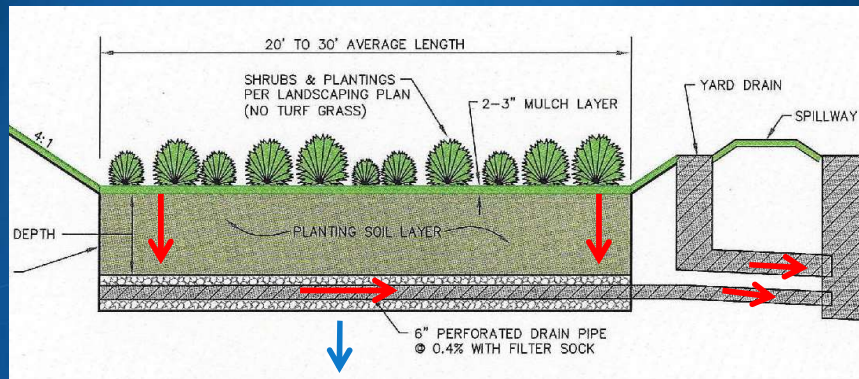
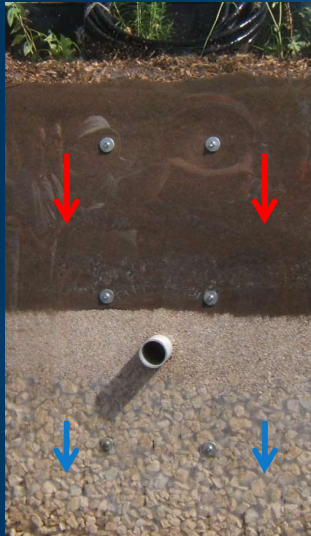
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# Bioretention (1004)



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# Vegetated Swale (1005)



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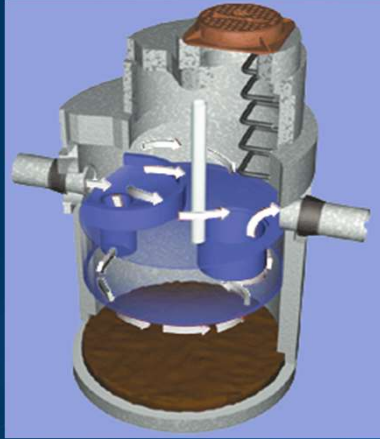


## □ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
  - Vegetation health and density
  - Mowing height (follow design requirement)
  - Length (follow design, not enclosed or lined)
- Permanent Ditch Check
- Sediment Accumulation
  - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
  - Surface water > 48 hrs after 0.5" rain

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# Proprietary Sediment (1006)



## □ Maintenance:

- Debris, Litter, Obstructions
- Petroleum sheen (if required)
- Structural
  - Cracking, spalling, corrosion, joint leak, liner
- Sediment Accumulation (NR 528)
  - Follow proprietary manufacturer's recommendations for frequency of accumulated sediment removal
  - Test or landfill the removed sediment

# Porous Pavement (1008)



## □ Maintenance:

- Debris, Erosion From Run On Area
- Regenerative Air or Vacuum Sweep
  - Twice per year to clean pavement surface
- Structural
  - Do not crack seal pavement surface
  - If pavers, joint aggregate (replenish, replace)
- Soil Clogging or Compaction Mitigation
  - Surface water > 24 hrs after 0.5" rain
  - Subsurface water > 72 hrs after 0.5" rain

# Record Keeping

- ❑ How do I obtain a copy of approved plans for my property?
- ❑ How long do I need to keep my inspection forms?
- ❑ What happens if I don't perform the required maintenance?

Village of Kimberly  
515 W. Kimberly Avenue  
Kimberly, WI 54136  
Phone: 920.788.7507

**STORMWATER MANAGEMENT SYSTEM  
INSPECTION, OPERATION, & MAINTENANCE FORM**

Site or Subdivision Name: _____		Parcel ID: _____	
Site Address / Location: _____			
Inspection Frequency (check one): <input type="checkbox"/> > 0.5 Inch Rain (R) <input type="checkbox"/> Monthly (M) <input type="checkbox"/> Biannual (B) <input type="checkbox"/> Annual (A) <input type="checkbox"/> 5-Year Cycle (C) <input type="checkbox"/> Other _____			
Date of Inspection: _____		Inspector Name: _____	
		Maintenance Crew Leader Name: _____	
Maintenance Items – Wet or Dry Detention Pond (1001)	Frequency	Observed?	Inspector Comments
1. Debris & Litter – At inlets and outlets (grate, orifice, weir, pipe, culvert, etc.)	R M B A C	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2. Debris & Litter – At other device location		<input type="checkbox"/> Yes <input type="checkbox"/> No	

**Sample Inspection & Maintenance Form**

*Thank You for inviting us to present today!*

## Questions?