



Maintenance Concerns, Objectives, and Goals

- Vegetation/Landscape Maintenance
- Endangered Species Habitat Creation
- Pollutant Removal Efficiency
- Clogging of the Outlet
- Invasive/exotic Plant Species
- Vector Control

General Description

Wet ponds (a.k.a. stormwater ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season) and differ from constructed wetlands primarily in having a greater average depth. Ponds treat incoming stormwater runoff by settling and biological uptake. The primary removal mechanism is settling as stormwater runoff resides in this pool, but pollutant uptake, particularly of nutrients, also occurs to some degree through biological activity in the pond. Wet ponds are among the most widely used stormwater practices. While there are several different versions of the wet pond design, the most common modification is the extended detention wet pond, where storage is provided above the permanent pool in order to detain stormwater runoff and promote settling. The schematic diagram is of an on-line pond that includes detention for larger events, but this is not required in all areas of the state.

Targeted Constituents

- | | |
|--------------------|---|
| ✓ Sediment | ■ |
| ✓ Nutrients | ▲ |
| ✓ Trash | ■ |
| ✓ Metals | ■ |
| ✓ Bacteria | ■ |
| ✓ Oil and Grease | ■ |
| ✓ Organics | ■ |
| ✓ Oxygen Demanding | ■ |

Legend (Removal Effectiveness)

- | | |
|----------|--------|
| ● Low | ■ High |
| ▲ Medium | |

Inspection/Maintenance Considerations

In order to maintain the pond's design capacity, sediment must be removed occasionally and adequate resources must be committed to properly maintain peripheral aquatic vegetation, control vector production, and to maintain effective pool volume. Wet ponds can become a nuisance due to mosquito and midge breeding unless carefully designed and maintained. A proactive and routine preventative maintenance plan (which can vary according to location) is crucial to minimizing vector habitat. A vegetated buffer should be preserved around the pond to protect the banks from erosion and provide some pollutant removal before runoff enters the pond by overland flow.



Inspection Activities	Suggested Frequency
<ul style="list-style-type: none"> ■ Inspect after several storm events to confirm that the drainage system functions, and bank stability and vegetation growth are sufficient. 	Post construction
<ul style="list-style-type: none"> ■ Inspect for invasive vegetation, trash and debris, clogging of inlet/outlet structures, excessive erosion, sediment buildup in basin or outlet, cracking or settling of the dam, bank stability, tree growth on dam or embankment, vigor and density of the grass turf on the basin side slopes and floor, differential settlement, leakage, subsidence, damage to the emergency spillway, mechanical component condition, and graffiti. 	Semi-annual, after significant storms, or more frequent as needed
<ul style="list-style-type: none"> ■ Inspect condition of inlet and outlet structures, pipes, sediment forebays, basin, and upstream and downstream channel conditions. Monitor drain times, and check for algal growth, signs of pollution such as oil sheens, discolored water, or unpleasant odors, and signs of flooding. 	Annual inspection
<ul style="list-style-type: none"> ■ During inspections, note changes to the wet pond or the contributing watershed as these may affect basin performance. 	
Maintenance Activities	Suggested Frequency
<ul style="list-style-type: none"> ■ Introduce mosquito fish, <i>Gambusia</i> spp., (where permitted by the Department of Fish and Game or other agency regulations) to enhance natural mosquito and midge control and regularly maintain emergent and shoreline vegetation to provide access for vector inspectors and facilitate vector control if needed. 	Post construction
<ul style="list-style-type: none"> ■ Perform vector control, if necessary. ■ Remove sediment from outlet structure. Dispose of properly. ■ Remove accumulated trash and debris in the basin, inlet/outlet structures, side slopes, and collection system as required. ■ Repair undercut areas and erosion to banks and basin. 	Semi annual, after significant storm events
<ul style="list-style-type: none"> ■ Maintain protected vegetated buffer around pond. Mow side slopes and maintain vegetation in and around basin to prevent any erosion or aesthetic problems. Minimize use of fertilizers and pesticides. Reseed if necessary. ■ Manage and harvest wetland plants. ■ Structural repair or replacement, as needed. 	Annual maintenance (if needed)
<ul style="list-style-type: none"> ■ Remove sediment from the forebay and regrade when the accumulated sediment volume exceeds 10-20% of the forebay volume. Clean in early spring so vegetation damaged during cleaning has time to re-establish. 	5- to 7-year maintenance
<ul style="list-style-type: none"> ■ Remove sediment when the permanent pool volume has become reduced significantly (sediment accumulation exceeds 25% of design depth), resuspension is observed, or the pond becomes eutrophic. 	>5 year maintenance

Additional Information

In most cases, sediment from wet ponds do not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the shoreline to prevent their reentry into the pond and away from recreation areas, where they could possibly be ingested by young children.

Sediments should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. Sediments containing high levels of pollutants should be disposed of properly.

For the best water quality benefit, the pond should hold water for at least 24 hours. It should drain down to the permanent water level within 72 hours of a storm event to avoid conditions which might increase water temperatures, deplete oxygen, promote vector growth, and/or cause odors.

References

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