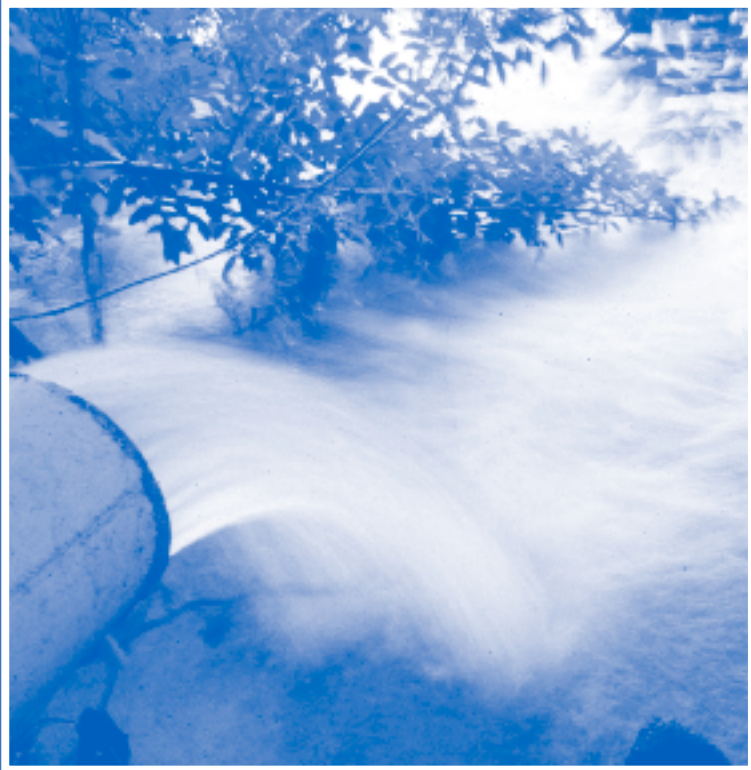


How To Operate & Maintain Your



Stormwater Management System

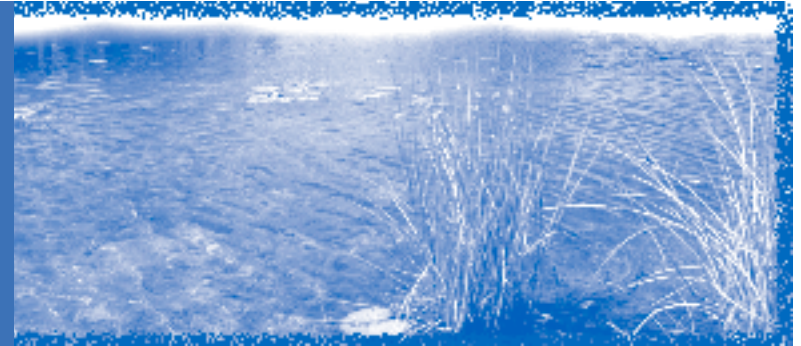


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Stormwater Management System: It's Your Responsibility

Surface water management facilities, such as ponds, ditches and swales, are constructed to trap and filter out pollutants in stormwater runoff from roads, parking lots, buildings and lawns. Discharge of untreated water to natural lakes, creeks, and rivers is harmful to natural vegetation and wildlife; this destroys one of the very things we like best about Florida — our enjoyment of the abundant clean water for recreation and aesthetic enjoyment.

The purpose of this informational pamphlet is to provide the entity/permittee responsible for the operation and maintenance of the Stormwater Management System (SWMS) with guidelines for establishing a program of routine maintenance procedures, which should minimize problems and maximize the appearance and performance of a SWMS.

Typically, site developers are responsible for operation and maintenance until construction is complete, then they are required by permit condition to transfer this responsibility to a homeowners', condominium owners', or property owners' association. After an association is legally established and construction of the surface water management system is completed, the association will assume responsibility. The operation and maintenance entity for shopping centers, individual stores and offices typically is the landowner or a management company hired by the landowner.

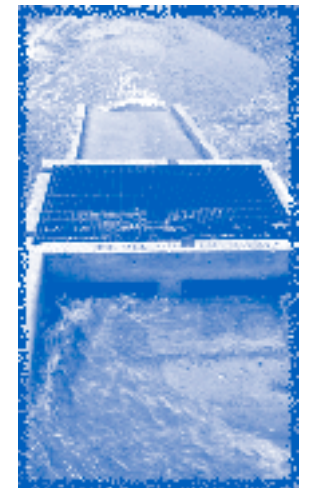


Your SWMS. . .

Your (SWMS) is designed and constructed to comply with certain environmental protection criteria. Stormwater ponds and their associated surface water management facilities are designed to capture and remove pollutants from specific volumes of stormwater runoff through processes such as percolation, filtering and/or detention. As long as they are constructed properly and maintained in an effective state, water quality standards are presumed to be met.

Stormwater management systems should be inspected on a routine basis to ensure that they are functioning properly. Inspections should be scheduled on a monthly or quarterly basis and following any major rain event. More frequent inspections may be necessary during the rainy season. Keeping detailed notes on maintenance activities will help when providing a report to the Southwest Florida Water Management District (District) at the time of your 18- or 24-month inspection. Environmental Resource Permit (ERP) or your Management and Storage of Surface Waters (MSSW) permit includes a condition that specifies how often the inspection reports are due.

It would be wise to designate one individual as the person responsible for overseeing operation and maintenance activities, monitoring and reporting. This will allow that individual to become well acquainted with the SWMS. Provide this person with a copy of the permit and District-approved construction drawings should questions or issues develop.



General Maintenance

1. All stormwater pipes, inlets, catch basins, manholes, flumes, pond inflow and outfall structures (including oil skimmers), and discharge pipes should be inspected on a regular basis (monthly or quarterly) and after major rainfalls. They should be maintained by removing built-up debris and vegetation and repairing deteriorating structures.
2. Chemicals, oils, greases or similar wastes are NOT to be disposed of directly to the stormwater facility or through storm sewers. Treatment ponds are designed to treat normal road, parking lot, roof and yard runoff only. Some chemicals may interfere with a treatment pond's functions or kill vegetation and wildlife. Dispose of these potentially dangerous materials properly by taking them to recycling facilities or to collection locations sponsored by many local governments.

Also, do not dispose of grass clippings in a SWMS. Grass clippings pose problems by smothering desirable vegetation, clogging outfall structures and, when they decompose, may cause unsightly algae blooms that can kill fish.
3. Accumulated pond sediments may contain heavy metals such as lead, cadmium and mercury, as well as other potentially hazardous materials. Therefore, sediments removed from storm sewers, inlets, pipes and ponds should be disposed of at an approved facility (check with your county Solid Waste Department or the Florida Department of Environmental Protection for disposal facilities approved to accept treatment pond sediment).
4. During any repair or maintenance activity, use care to avoid causing erosion or siltation to adjacent or off-site areas.
5. Remember, alterations (filling, enlarging, etc.) of any part of the stormwater facility is not permitted without prior approval from all applicable governing agencies.

continued on page 4

General Maintenance *continued from page 3*

6. The approved Operation and Maintenance Permit and as-built drawings are available at your local District service office. Refer to those plans and permits or additional restrictions, instructions and conditions.
7. It is usually more cost-effective to monitor and perform routine maintenance on a SWMS, rather than let it fail and have to reconstruct the entire system.
8. Mosquito growth can be minimized in a SWMS by the following measures:
 - Do not dump grass clippings or other organic debris into a SWMS — decaying grass clippings and other decomposing vegetation create ideal conditions for breeding mosquitoes.
 - Clean out any obstructions that get into the system. Debris can obstruct flow and harbor mosquito eggs and larvae.
 - Remove water lettuce and water hyacinth, which nourish and shelter mosquito larvae.
 - Stock ponds with predatory “mosquito fish” – Gambusia minnows, which may be collected from other ponds and ditches and introduced into your SWMS. Remember, the introduction of grass carp into your SWMS will require District approval.



Ditches & Swales

(AKA Percolation Ponds)

Some Environmental Resource Permits and (Management and Storage of Surface Water Permits) require that the vegetation in some ditches be protected to offset wetland impacts permitted during construction or for water quality treatment. The permit or approved construction should clearly identify which ditch vegetation must be preserved. If you're unsure, contact your local District service office.

If vegetation is not required to be protected, ditches and swales should be periodically mowed and cleaned of accumulated refuse. During the mowing operations, ditches and swales should be inspected for bare spots, damage or erosion. Bare areas should be sodded or seeded to replace the grass cover. In the case of erosion, replace the missing soils and bring the area back to grade.

Some ditches are designed to store runoff for short periods of time utilizing ditch blocks or raised inlets. These ditch blocks or inlets should not be removed or altered.

If you are unable to identify what type of treatment method serves your development, contact your District service office. Addresses are on the back of this pamphlet.



Dry Retention Ponds

(AKA Percolation Ponds)

How to recognize: Dry retention ponds are designed to be dry, except for 72 hours following a rain event, or a series of rain events if they occur frequently. They are sodded or grassed, with a concrete overflow structure that has a grated top and sometimes a rectangular weir cut in the side of the concrete structure.

How they work: A portion of the site's storm water percolates through the topsoil. The pollutants settle out and are trapped on the pond's bottom. Exposure to sun and oxygen helps break down the greases and oils.

Why they fail: Accumulated sediments with silts, oils and greases eventually seal off the porous bottom sands, resulting in little or no percolation through the filtering sands. Untreated water may discharge through the overflow structure if this occurs.

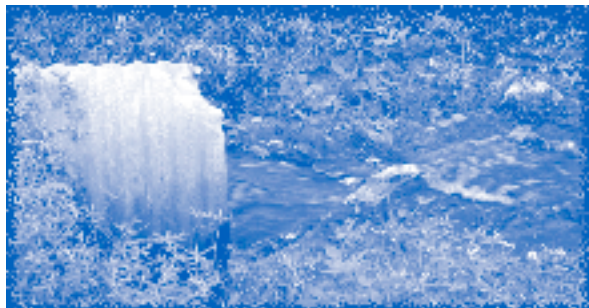


Dry Retention Ponds

(AKA Percolation Ponds)

MAINTENANCE SUGGESTIONS

1. On a monthly or quarterly basis, and following a storm event, the entity responsible for maintenance should make an inspection of the pond and its outfall structure to ensure that the system is operating properly. If standing water persists longer than 72 hours after a normal summer rain event, or if wetland vegetation such as cattails grow in the pond, the stormwater facility may be in need of repair. Repairs may be as simple as scarifying or raking the pond bottom, or may consist of removing the bottom sediment (approximately the top foot of soil) and replacing the soil with clean sand. For more information, contact your local District service office.
2. Mow frequently enough to prevent thatch buildup. Pick up grass clippings after cutting. Limit fertilizer use around the pond, and do not fertilize grass in the pond area.
3. Resod any areas (sides or bottom) where grass or sod has been removed or eroded.
4. Keep the outfall structure clear of debris and vegetation.



Effluent Filtration

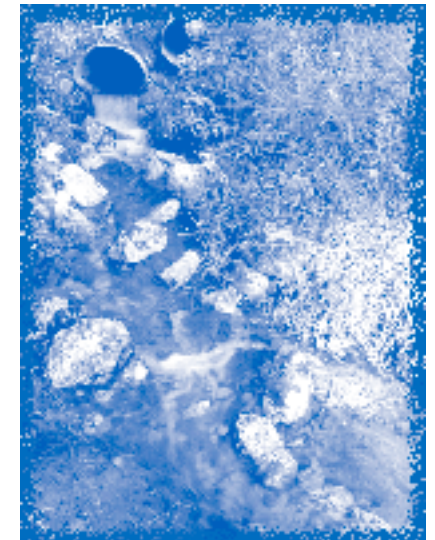
Side-drain Filtration or Underdrain Filtration

How to recognize: These ponds may either be dry or wet, but rely on a filtration system made of perforated pipe laid in a bed of filter media, such as sand, to remove pollutants. "Cleanouts," or vertical pipes with caps screwed on top, are connected to the buried pipes and extend up to the pond surface or bank. It is essential that the cap is always kept secured on the cleanout so that untreated water is not discharged through the cleanout.

How they work: A portion of the site's storm water percolates through the filter media into the perforated pipe and out through the control structure. Pollutants settle out or are trapped in the filter media. In addition, exposure to sun and oxygen helps break down the greases and oils.

Why they fail: The filter bed may become clogged with accumulated sediment, oils and greases, resulting in little or no percolation through the filtering sands. Untreated water may discharge through the overflow structure if this occurs.

For maintenance suggestions see page 9



Effluent Filtration

Side-drain Filtration or Underdrain Filtration

MAINTENANCE SUGGESTIONS

In general, if approximately 36 hours after a rain event you notice that water discharges over the top of the concrete control structure, rather than through the perforated pipe, it may be a signal that the pond is not functioning properly.

1. On a monthly or quarterly basis, and following a storm event, inspect the pond and its outfall structure to ensure that the system is operating properly.

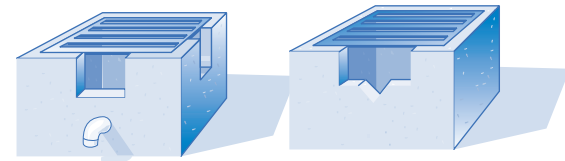
Repairs may be as simple as scarifying or raking the filter sand, forcing water through the cleanout to cleanse the perforated pipe, or as involved as replacing the filter media. Check construction plans or contact the District for more information if any questions arise.

2. Mow frequently enough to prevent thatch buildup. Pick up grass clippings after cutting. Limit fertilizer use around the pond, and do not fertilize grass in the pond area.
3. Resod any areas where grass has been removed or eroded. Do not sod over the filter media. Place stone or gravel over the filter media for stabilization, if necessary.
4. Keep the outfall structure clear of debris and vegetation.



Wet Detention Ponds

How to recognize: Look at the outfall structure. If it looks similar to the ones below and about a third of the pond is shallow or covered with vegetation (or recruiting vegetation if the pond is newly constructed), there's a good chance the facility is a wet detention pond.



How they work: Wet detention ponds are designed to detain storm water for several days while pollutant-laden sediments settle to the pond bottom. Additionally, sunlight and oxygen break down greases and oils. Vegetation in the shallow littoral zone (the shallow zone created near the pond outfall structure that designed to be vegetated) helps treat water through nutrient and heavy metal uptake.

Why they fail: After some years of use, wet detention ponds may fail. The control structure may become clogged with vegetation and sediment. Vegetation and sediment may accumulate in the pond, reducing the pond's ability to store storm water.

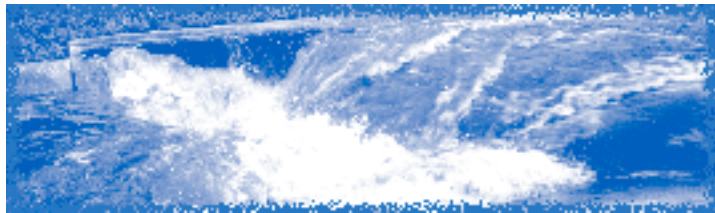
For maintenance suggestions see page 11

Wet Detention Ponds

MAINTENANCE SUGGESTIONS

1. All sodded side slopes and berms should be maintained by the procedure outlined for ditches and swales. Inflow structures should be maintained by the procedures outlined in this brochure under "General Maintenance."
2. Maintain, rather than remove, wetland vegetation that becomes established in the littoral zone. Do not cut, mow, use herbicide or grass carp to remove any of the vegetation in the littoral zone without prior approval from the District. Refer to the conditions of the permit and construction notes for any further instructions.
3. On a monthly or quarterly basis, and after severe rainfall events, check the area in front of the outfall control structure for built-up sediments, vegetation, trash and debris that impair the operation of the structure. Remove sediment, vegetation, trash and debris to an approved disposal site.
4. When littoral zone vegetation and sediment accumulate to such an extent that water depth decreases, the littoral zone may need to be regraded and revegetated. When it appears that a pond has reached this state, it is best to contact a District representative prior to large-scale maintenance.

When wet detention pond littoral zones are intentionally planted for aesthetic purposes, or to offset wetlands' impacts, removal of weedy or exotic vegetation may be required and accompanied by replanting of desirable vegetation. Check with your local District service office to determine specific requirements.



Southwest Florida Water Management District Service Offices

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2379 Broad Street
Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476

TAMPA
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(813) 985-7481 or 1-800-836-0797

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