

**Table 2: Maintenance of Stormwater Ponds**

Stormwater ponds should retain water and slowly release by either infiltration or outflow.

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Recommended Maintenance to Correct Problem
General	Follow applicable Guidance from Table 1 AND applicable guidance from this table.		
	Vegetation growth in <b>dry ponds</b> (mowing and brushing)	Vegetation growth restricts access, limits sight distance, obstructs water flow, or interferes with maintenance activity.  Collected water should drain.	Dry ponds need vegetation on the bottom and sides. Vegetation management typically occurs around and within the facility.  Mow access, berms, bottom, and side-slopes as noted in the District Integrated Vegetation Management (IVM) Plan. (typically annually)  Heavy equipment is allowed on dry pond bottoms unless access restrictions are listed in the O&M Manual.
	Vegetation growth in <b>wet ponds</b> (mowing and brushing)  NOTE: Wet ponds are not typical.	Vegetation growth restricts access, limits sight distance, obstructs water flow, or interferes with maintenance activity.  Water may be stored year-round without draining.	Wet ponds need vegetation on the bottom and sides. Vegetation management typically occurs around the facility.  Mow access and berms as noted in the District Integrated Vegetation Management (IVM) Plan.  Ponds bottoms are intended to capture and store water. Vegetation removal from pond bottoms is infrequent.
	Sediment accumulation in pre-treatment features (e.g. forebays, basins, or fully exposed impermeable liners)  NOTE: Exposed liners are not typical.	Sediment affects flow.  Sediment jeopardizes infrastructure.	Remove sediment from ponds and pipe ends as needed to ensure adequate drainage into treatment pond (grassy or wet pond).  Use methods that minimize disturbance to surrounding vegetation.  Heavy equipment is allowed on dry pond bottoms unless access restrictions are listed in the O&M Manual.  Sediment may contain oil and other pollutants, especially in areas with high ADT. Refer to the ODOT Maintenance Environmental Management System (EMS) Manual for the disposal of contaminated sediment. Note: Pollutant concentrations may increase if sediment is not routinely removed.

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Storage areas	Sediment accumulation along bottom of grassy ponds	<p>Sediment inhibits the flow of water through the grass (&gt;12 inches deep).</p> <p>Sediment inhibits grass growth.</p>	<p>Where practical use a Vactor® truck to remove sediment from grassy areas. When Vactoring® is not practical, follow ditch cleaning practices.</p> <p>Restore slope and geometry to design standards, if necessary.</p> <p>Reseed grass cover where needed.</p> <p>Stormwater should infiltrate or flow toward outlet once inflow has ceased.</p> <p>Refer to the general section of this table for side-slope mowing and other routine maintenance actions.</p>
	<p>Sediment accumulation in wet ponds or channels.</p> <p>NOTE: Currently there is limited use of wet ponds to treat stormwater.</p>	<p>Capacity has noticeably decreased (examples below)</p> <ul style="list-style-type: none"> <li>• low and medium flows go through the bypass,</li> <li>• the ordinary high water level has increased,</li> <li>• flooding occurs when the outflows are not blocked,</li> <li>• pond bottom is level with outlets.</li> </ul>	<p>Remove sediment build-up from pipe ends as needed to ensure flow. Use methods that minimize disturbance to surrounding vegetation.</p> <p>Remove sediment to restore designed shape and depth.</p> <p>In high ADT areas, pond dredging may be required every 5 to 10 years to restore the capacity.</p> <p>Cease sediment removal when riprap or liner is encountered.</p> <p>Reseed if necessary to control erosion.</p>
	Erosion	Side slopes show evidence of erosion greater than 4 inches deep and the potential for continued erosion is evident.	<p>Promptly address erosion that causes immediate problems (e.g. damage to highway or highway structure)</p> <p>Schedule non-urgent repairs with routine work.</p> <p>Stabilize slope using appropriate erosion control and repair methods.</p> <p>Repair the cause of the erosion where possible.</p> <p>If necessary, contact the ODOT Erosion Control Coordinator to evaluate the condition.</p>

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Storage areas	Beaver dams	Dam inhibits function or jeopardizes the infrastructure.	<p>Dispose of dam debris offsite or outside of the riparian area.</p> <p>Coordinate the removal or relocation of beaver with Oregon Department of Fish and Wildlife (ODFW). Consider installing deterrents where appropriate.</p>
	Flooding	Water is flowing over or is approaching the top of the pond	<p>Check storm drain pipes and structures for blockage. Ensure valves are open. Remove obstructions to restore flow.</p> <p>Evaluate and remove excessive sediment from pond storage areas.</p> <p>Contact the Region Hydraulic Engineer to evaluate the source of flooding or provide design modifications.</p>
Treatment Components	Poor vegetation coverage	Vegetation (grass) is sparse or eroded patches occur in more than 10 percent of pond bottom.	<p>Repair and reseed as appropriate to restore coverage.</p> <p>Install erosion control measures as needed.</p> <p>Trim overhanging limbs and remove brushy vegetation that limit grass growth (provide too much shade).</p>
	Missing or eroded amended soil mix	Bare soil is observed over 10 percent of the amended area.	<p>Identify and resolve erosion problem</p> <p>Add amended soil. Contact a Region Hydraulics Engineer for required material specifications.</p>
	Amended soil mix along pond bottom is clogged	Standing water is observed for seven (7) consecutive days or longer from May through October.	<p>Remove and replace amended soil mix. Contact a Region Hydraulics Engineer for required material specifications.</p> <p>Replace or repair damaged underlying drainage geotextile, impermeable liner, drain piping, and granular drain backfill material when applicable.</p>
Granular drain backfill material for underdrain pipe plugged	Amended soil mix has been replaced and standing water is still observed for seven (7) consecutive days or longer from May through October.	<p>Remove and replace granular drain backfill material. Contact a Region Hydraulics Engineer for required material specifications.</p> <p>Install new drainage geotextile over new granular drain backfill material.</p> <p>Replace amended soil mix.</p>	

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Treatment Components	Impermeable liner damage  NOTE: Liners (if installed) are typically below the grass surface and may not be visible.	Liner is damaged (e.g. during sediment removal or by motoring public). Liner is damaged when condition allows potential contamination to be released to the subsurface.	Repair or replace the liner with similar material.  In many cases, rigid plastic liners may be repaired by welding a similar material over the damaged portion or using a non-toxic, waterproof epoxy.  If necessary, contact a Region Hydraulics Engineer for technical assistance regarding permanent repair.
Berms and Dikes	Settlement	Any part of the berm has settled 4 inches or lower.  Note: Settlement may indicate potential problems with the facility.	Repair berm to design height with similar materials.  Contact a Region Hydraulics and Geotechnical Engineer as needed to evaluate the source of the settlement and determine repair options.
	Flow-through	Water is flowing through the pond berm.	Correct cause of flow through (e.g. eliminate burrowing rodents)  Install erosion control measures where appropriate.  Repair berm with similar materials.  If necessary, contact a Region Geotechnical Engineer to evaluate the condition.
	Sloughing	Ongoing erosion is observed with potential for erosion to continue.	Where possible correct the cause of the erosion. Install or replace energy dissipaters where appropriate.  Install erosion control measures where appropriate  Repair berm with similar materials.  If necessary, contact the ODOT Erosion Control Coordinator to evaluate the condition.

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<p>Structures and piping</p> <p>Includes</p> <ul style="list-style-type: none"> <li>• flow splitters</li> <li>• vaults</li> <li>• inlets</li> <li>• bypasses</li> <li>• valves</li> <li>• catch basins</li> <li>• gates</li> </ul>	<p>Damaged or missing components</p>	<p>Flow control assembly is not working properly (e.g. loose, bent, unattached, etc.).</p>	<p>Repair or replace valves, gates, orifices and pipes as necessary with similar components.</p> <p>Divert flows when needed.</p>
	<p>Obstruction or blockage</p>	<p>Water does not flow in, through, or out of the structure or piping.</p>	<p>If valves are part of the flow control assembly, verify the valves are open. Refer to the O&amp;M for the location of control valves.</p> <p>Remove obstructions to restore flow (e.g. remove trash, debris, sediment, or vegetation as necessary).</p> <p>Jet rodders may be used to clean piping unless specifically prohibited in the O&amp;M plan.</p>
<p>Outfalls</p>	<p>Insufficient rock armoring at outlets</p> <ul style="list-style-type: none"> <li>• along channel side slopes and bottom</li> <li>• pipe outlet</li> <li>• along the length of spillway</li> </ul>	<p>Minimal layer of rock exists</p> <p>Rock missing along armored area</p> <p>Flow channelization or high flows exposed native soil around the rock armored area</p>	<p>Install erosion control measures</p> <p>Repair or replace rock armoring to original design standard</p> <p>Repair, re-grade, and reseed eroded areas adjacent to rock armoring.</p> <p>Contact a Region Hydraulics Engineer for technical assistance if rock armoring problems continue or a highway structure is at risk</p>