

Lagoons Need Proper Operation and Maintenance

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Lagoon systems include one or more pond-like bodies of water or basins designed to receive, hold, and treat wastewater for a predetermined period of time. Lagoons are constructed and lined with material, such as clay or an artificial liner, that will prevent leaks to the groundwater below. One of the advantages of lagoons is they usually require fewer staff hours to operate and maintain than other systems; however, this doesn't mean they can be neglected. Routine inspections, testing, record keeping, and maintenance are required by local and state agencies, and are all necessary to ensure that lagoons continue to provide good treatment.

Routine Inspections

How often lagoons should be inspected depends on the type of lagoon, how well it functions, and local and state requirements.

Some lagoons need more frequent checking in the spring and summer, when grass and weeds grow quickly and when seasonal rental properties are occupied.

Systems with more than one lagoon operated in parallel or series may need operators to check and adjust flow levels or divert flows to and from certain lagoon cells to optimize performance. With aerated systems, mechanical components need to be checked and serviced as needed and according to manufacturer recommendations.

Most inspection visits include brief checks of the banks, dikes, grounds around the lagoon, inlet and outlet pipes, and the appearance, level, and odor (if any) of the water. Records should be kept of every visit and all observations, including information about the weather or other factors that may be influencing lagoon conditions. More extended inspections and formal sampling and testing are periodically necessary.

With regular inspections, testing, and record keeping, operators become familiar with the natural cycles and particular requirements of a system, as well as what factors tend to influence its performance.

Testing

Tests required for lagoons include those that measure the wastewater's temperature, pH, and the amount of dissolved oxygen, solids, nitrogen, and disease-causing organisms in the effluent.

Regulatory agencies use water quality measures as indicators of treatment system performance. Among the most important indicators are biochemical oxygen demand (BOD) and total suspended solids (TSS). BOD is important because it

measures how much oxygen organisms in the wastewater would consume when discharged to receiving waters. TSS measures the amount of solid materials in the wastewater. If BOD or TSS levels in the effluent are too high, they can degrade the quality of receiving waters.

Together, the results of all these tests can provide a picture of the conditions inside the lagoon and show how well it was performing at the time the tests were taken. But because lagoon conditions change constantly, most tests must be performed several times, and sometimes at specific intervals or times of the day, to get an accurate overall view of the lagoon's health.

Operators can be trained to take samples and perform some or all of the tests themselves. It is usually more practical for part-time operators of small systems to send samples out to a lab to be tested.

Maintenance

Mowing grass and controlling weed growth in and around the lagoon is one of the easiest and most important tasks in lagoon maintenance. Long grass and weeds block wind and provide breeding areas for flies, mosquitoes, and other insects. Weeds also can trap trash, grease, and scum, which cause odors and attract insects. Weeds are used as food by burrowing animals that can cause damage to banks and dikes. In addition, dead weeds may contribute to increased BOD levels.

It is also important to control weeds that grow on the water surface, like duckweed and watermeal. These weeds take up valuable space that should be occupied by algae, and they can stop sunlight and wind from penetrating the wastewater.

Scum that collects on the water surface should be removed for the same reasons as duckweed, but also to control odors and insects and to prevent inlet and outlet clogging. Trash, leaves, and branches that blow around the lagoon should be picked up because they can also clog inlet and outlet pipes.

Finally, the depth of the sludge layer in lagoons should be checked at least once per year, usually from a boat using a long stick or hollow tube. In most lagoon systems, sludge eventually accumulates to a point it must be removed, although this may take years. Performance will suffer if too much sludge is allowed to accumulate. ■

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