Wastewater Treatment Facility Abandonment Guidelines

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Lagoon (Pond) Wastewater Treatment Facilities

A. Direct Discharge - NPDES Permitted Facilities

Direct discharge to a receiving stream is allowed if adequate control is maintained to assure that water quality violations do not occur. Adequate control is generally available if sufficient long-term stabilization is provided and the rate of the discharge is regulated.

1. No timetables are available for determining the optimum stabilization time for an abandoned lagoon. Certain parameters, such as geographic location, organic build up and general health of the lagoon all must be considered. However, draining should be accomplished during the winter or early spring when the maximum stream dilution water is available. Six months is the acceptable minimum and 12 months desirable for full reduction of pathogenic bacteria and oxygen demanding compounds. Such a period will provide adequate time for full endogenous respiration of remaining bacteria and microorganisms. A partial discharge of approximately 12 to 15 inches of middle layer liquids may be considered as early as three months providing that the remainder of the system is stabilized for an additional three to nine months. Such requests will be considered on a case-by-case basis and require documentation of lagoon water quality by the permit holder.

2. Under ideal conditions, the rate of discharge can be controlled through releases from the effluent structure valves and then over the effluent weir. Discharge should be allowed only from the middle layer of the liquid depth to minimize disposal of algae or bottom sediments. Flow rates should not exceed the NPDES permitted average daily flow of the lagoon. However, many effluent structure drain valves break or rust shut and alternative means often have to be devised.

    a. The preferred method of dewatering the lagoon is to pump the supernatant from the lagoon into the effluent structure where the water can be discharged through the effluent pipe and into the receiving stream. If the effluent structure is inoperable or the effluent pipe is plugged, the discharge line of the pump can be laid over the top of the dike and water allowed to discharge onto the receiving stream. It is important not to cause any erosion of the exterior embankment of the lagoon which would adversely impact the water quality of the receiving stream. Potential erosion can be reduced by providing a pile of rip rap or a piece of concrete on which to discharge the water from the pump.

    b. If the effluent structure is totally unusable or nonexistent, a siphon should be used as the second acceptable alternative.

    c. If alternatives a or b cannot be implemented, then the concrete wall of the effluent structure near the effluent valves should be cracked with a chisel and

sledge hammer or by means of a backhoe. This will allow use of the effluent structure baffle boards and the weir to control the discharge.
Liquid levels can be controlled by the backfilling of soil at the opposite end of the pond if conducted concurrently with draining.

It is recommended that two semi-circular rows of erosion fabric fencing be staked around the effluent structure valves within the lagoon. The fabric fencing will help screen out floating solids, denitrifying sludge and soil eroded from the interior embankments of the lagoon as the water level is reduced.

d. Breaching the dike of the lagoon is an unacceptable means of flow control.

B. Receiving Stream Flow and Dissolved Oxygen Monitoring

a. The discharge flow must be monitored and recorded daily. This can be accomplished by monitoring the head of the effluent weir and using a hydrograph. The flow rate can also be determined by knowing the pumping capacity of the pump and recording the relapsed time of the pump.

b. The effluent discharge must not suppress the downstream dissolved oxygen (DO) concentration of the receiving stream below the background DO concentration. The background DO concentration should be determined at a monitoring location upstream of the discharge point. Both the background and the downstream monitoring locations should not be located in an area where the stream is pooled but should be free flowing. It is recommended that the DO concentration be determined before 10:00 am so that photosynthesis does not have a major impact on the DO reading.

C. Discharge To Municipal Wastewater Treatment Systems

For small lagoons and where otherwise economically feasible, the environmentally acceptable solution is to discharge back into the municipal sewer system and treat the waste at a municipal wastewater treatment system. In some cases, the water from the lagoon will gravity flow to the municipal sewer system. In most cases, pumping will be necessary and the project costs will be a function of the volume of water to be pumped.

D. Land Application of Sludge

A discharge of sludge to a receiving stream is a violation of the Water Quality Act. The discharge of sludge into a municipal sewer system is operationally awkward and is a maintenance and treatment problem. Sludge and debris will deposit in the gravity sewer and could possibly plug the sewer.

If suitable land is in close proximity to the treatment facility land application of the liquid or deterred sludge should be evaluated as a beneficial means of properly disposing of the sludge from within the treatment unit. One time applications of sludge require that a sludge management plan (SMP) be prepared and a modification of there NPDES permit be

submitted by the City/County/Owner to the EPD-Engineering & Technical Support Program (E&TSP) for review and approval. Determine the amount of sludge that has deposited in the bottom of the pond by establishing a grid pattern on the pond surface and collected sludge blanket depths at multiple grid points. Determine the average sludge blanket depth in the pond and then determine the cubic feet and gallons of sludge that has to be removed or incorporated. Sludge deposits over a foot deep can cause the miring of heavy construction equipment and delay the abandonment of the pond.

If the treatment unit is a lagoon that is less than one acre in surface area and the City/County/Owner doesn't currently have an approved sludge application site, then the E&TSP will on a case by case situation make a determination whether to allow the sludge from the facility to be disposed of on-site. If approved one of two methods could be selected for this alternative. One method would be to allow the City/County/Owner to incorporate soil, sludge and lime together and to dispose of the mixture within the existing lagoon. A two-foot cover of suitable soil would be placed over the entire lagoon area. The other method would be to use the Abridge and fill operation.

Most contractors favor a "bridge and fill" operation which covers the sludge. When dewatering is partially accomplished, the berm at the far end of the lagoon is "bridged" into the lagoon. A bridge layer, four to five feet deep, is necessary before the backfill will support the weight of construction equipment. Insitu material is acceptable, although the berms are often insufficient in volume to completely fill the pond excavation. Earthen barrow material is often needed to fill the lagoon.

Another sludge disposal alternative that could be evaluated is composting. Liquid sludge could be pumped from the lagoon and deterred on the embankment of the lagoon by means of a portable belt press or plate and frame unit. The deterred sludge could then be transported to a commercial composting system or a composting system could be developed by the City/County/Owner. All composting systems must be approved by the EPD-Engineering & Technical Support Program (ETSP).

E. Sludge And Odor Control

Odor control is often very difficult because of the accessibility of the partially drained lagoon. In highly sensitive areas, such as a densely populated subdivision, lime stabilization may be accomplished by spraying a lime slurry on to the remaining uncovered sections of the lagoon, dry lime broadcasting or dry lime incorporation into the sludge. Odor control is most easily accomplished during the winter months.

F. Synthetic Pond Liners

Synthetic pond liners should be removed when possible and properly disposed of or recycled.

G. Grading And Drainage

Whether the lagoon is allowed to revegetate naturally or is converted to another land use, proper drainage must be provided. Drainage should preferably be directed off of and away from the lagoon site, allowing the lagoon to settle and stabilize naturally without the nuisance of pools and puddles.

It is appropriate to address the type of land use considered acceptable for a reclaimed waste stabilization lagoon. Three to five years is typically required for natural settlement to occur; hence, the site's feasibility for supporting a structure is questionable. Additionally, there is some question as to whether methane gas would result from continued anaerobic digestion of the sludge layer. Generally, backfilling and grading should be designed to accommodate considerable subsidence and the Division recommends against the construction of structures above the old lagoon.

Mechanical Wastewater Treatment Facilities

1. Dewater the entire facility of supernatant and remove and properly dispose of all sludge. This may require using a submersible pump to remove any liquids that remain in the facility that cannot be drained.

2. Disconnect all electrical power.

3. Properly remove all chemicals and compressed gases.

4. Coordinate with the EPD Underground Storage Tank Program the removal and proper disposal of all underground storage tanks.

5. Salvage all mechanical equipment. Sell off all equipment that is in good condition and sell for scrape all remaining metal. Many package plants that are in good condition can be removed, reconditioned and then resold to a new owner. The Georgia Association of Water Professionals newsletter has a section where someone trying to sell an old piece of equipment can advertise.

6. Upon EPD-ETSP approval, the owner maybe allowed to abandon the facility in place.

7. Ideally you should demolish all concrete and steel structures three feet below ground level. All concrete and steel tanks should be cracked to allow drainage of rainwater. Soil should then be backfilled over the structures. Additional soil maybe needed to fill all holes and voids created by the removal of the old wastewater treatment units.

8. The entire facility site should then be stabilized with grass.

9. The facility NPDES permit should then be allowed to expire and not be reissued or the permit should be revoked and a letter sent to the EPD indicating that the facility is no longer in service.

Septic Tanks

1. The residential plumbing should be connected to a gravity sewer prior to abandoning the septic tank. Coordinate the abandonment of the septic tanks through the local county health department.

2. Remove and demolish the concrete top of the existing septic tank.

3. Pump out and properly dispose of all solids and liquids from the septic tank. Pressure wash the sides of the septic tank and pump out the liquid.

4. Break the concrete bottom of the septic tank to allow drainage. Contractors typically us a backhoe punch attachment to assist in punching holes in the bottom of the tank.

5. Broadcast a large amount of lime over the bottom of the septic tank.

6. Place a minimum of 6 inches of No. 57 stone on top of the lime to allow drainage.

7. Fill the septic tank with compacted soil to the elevation of the existing ground.

8. Grass all disturbed areas. Establish a viable stand of grass that covers at least 98% of the total area with no bare spots exceeding one sq. ft. The ground surface must be fully stabilized against erosion.

9. Structures must not be constructed above the abandoned septic tank unless the tank is totally demolished and the soil within the tank is compacted.

Sand Filters

1. Disconnect the pipe that connects the septic tank to the sand filter.

2. If the sand filter has a concrete top and was installed three feet below the ground surface then the sand filter can be abandoned in place.

3. If the concrete top of the sand filter was installed at or above the ground surface then the concrete top must be removed and properly disposed of at a C&D landfill. In addition, the sand filter concrete walls must be demolished to a depth of three feet below grade.

4. If the sand filter has a concrete bottom then it must also be penetrated in several locations to allow the drainage of rainwater.

5. Backfill suitable soil over the sand filter and fine grade the ground surface.

6. If the sand filter is an above ground tank design than remove the sand filter media, demolish the metal tank and properly dispose of the media and metal tank at a landfill.

7. Grass all disturbed areas. Establish a viable stand of grass that covers at least 98% of the total area with no bare spots exceeding one sq. ft. The ground surface must be fully stabilized against erosion.

8. Structures must not be constructed above the abandoned sand filter unless the filter is totally demolished and the soil within the filter is compacted.

Chlorine Contact Chamber (CCC) and Associated Equipment

1. Disconnect all electrical and natural gas supplies to the chlorination building.

2. Disconnect and properly dispose of all chlorine gas cylinders and chemicals used for effluent disinfection.

3. Salvage and properly dispose of all chlorinators, heaters, ventilators, scales, mixing tanks, mixers, emergency repair kits, self-contained breathing apparatus, valves and associated piping.

4. Demolish and properly dispose of all construction debris associated with the chlorination building.

5. If the chlorine contact chamber has a concrete cover, remove and properly dispose of the concrete top at a C&D landfill.

6. Pump out and properly dispose of all solids and liquids from the CCC. The contents must be disposed of at an EPD permitted wastewater treatment facility.

7. In some cases, the permittee may wish to abandon the facility in place. Ideally you should demolish all concrete structures three feet below ground level.

8. Crack the concrete bottom to allow drainage.

9. Place a minimum of 3 inches of lime in the bottom of the tank.

10. Place a minimum of 6 inches of No. 57 stone on top of the lime to allow drainage.

11. Fill the tank with compacted soil and backfill to elevation of the existing ground.

12. An NPDES permit associated with a septic tank, sand filter and chlorination treatment systems should be allowed to expire and not be reissued or the permit should be revoked and a letter sent to the EPD indicating that the facility is no longer in service.

Imhoff Tanks

1. If the Imhoff tank has a concrete cover, remove and properly dispose of the concrete top at a C&D landfill.

2. Pump out and properly dispose of all solids and liquids from the Imhoff tank.

3. In some cases, the owner may wish to abandon the facility in place. Ideally you should demolish all concrete structures three feet below ground level.

4. Crack the concrete bottom to allow drainage.

5. Place a minimum of 3 inches of lime in the bottom of the tank.

6. Place a minimum of 6 inches of No. 57 stone on top of the lime to allow drainage.

7. Fill the tank with compacted soil and backfill to elevation of the existing ground.

8. The facility NPDES permit should then be allowed to expire and not be reissued or the permit should be revoked and a letter sent to the EPD indicating that the facility ‘s no longer in service.

Pump Station

1. Dewater the pump station of wastewater. Remove and properly dispose of all sludge deposited in the bottom of the wet well. This may require using a submersible pump to remove any liquids and sludge that remain in the pump station.

2. Disconnect all electrical power at the weather head of the power pole.

3. Properly remove all chemicals and compressed gases (if present).

4. Salvage all mechanical equipment. Sell off all equipment that is in good condition and sell for scrape all remaining metal. Many pump and motors that are in good condition can be removed, reconditioned and then resold to a new owner. The Georgia Association of Water Professionals newsletter has a section where someone trying to sell an old piece of equipment can advertise.

5. In some cases, the owner may wish to abandon the facility in place. Ideally you should demolish all concrete and steel structures three feet below ground level. All concrete or steel wet wells should be cracked to allow drainage of rainwater. Place 6 inches of gravel in the bottom of the wet well followed by two inches of lime. Soil should then be backfilled into the wet well. Additional soil maybe needed to fill all holes and voids created by the demolition of the old pump station.

6. The entire pump station site should then be stabilized with grass.

7. Provide EPD with a letter indicating that the pump station is no longer in service.

Land Application Systems - LAS Permitted Facilities

1. Properly abandon the pretreatment system waste stabilization lagoon or mechanical wastewater treatment facility as previously discussed. Land applications systems do not have an NPDES permit for a point discharge. All liquid wastewater must be pumped to an approved spray irrigation site or discharged to a municipal wastewater sewer system.

2. Remove all above ground piping, risers and sprinklers.

3. Remove all buried distribution piping and valves.

4. Remove all spray irrigation site signs.

5. Salvage all piping, valves, sprinklers, pumps,

6. Properly plug all ground water monitoring wells. Without proper plugging of the well, the abandoned monitoring well will become an avenue of aquifer contamination. Plugging can also serve to inhibit water loss from artesian aquifers and to eliminate the physical hazards of an open hole. Proper plugging materials and techniques vary according to the original well construction and the hydrology of the site. The general procedure for plugging shallow monitoring wells constructed in aquifers includes three steps.

    a. Remove all obstructions in the well that could interfere with the plugging operation and thorough flushing of the well to purge residual drilling fluids and other fine detritus.

    b. Remove the well casing (where practical) to ensure placement of an effective seal-as a minimum when the casing is not properly grouted, the upper 20 feet of the casing must be removed.

    c. Seal the well with impermeable filler such as Portland cement.

    Detailed procedures for plugging a monitoring well are described in the DNR-Manual For Groundwater Monitoring

7. Grass all disturbed areas. A ninety percent grass cover should be established.

Asbestos Cement Pipe (ACP)

The USEPA banned the use of ACP on July 12, 1989 because of the potential adverse health effects in exposed persons. Pipe products find use in water supply, gravity sewer, force main and irrigation systems. Asbestos cement sheets are used in a variety of construction applications. Other uses of asbestos include underlayment, roof papers and floor and ceiling tiles.

ACP should be abandoned in place or properly removed and disposed. Follow Best Practices for Removing Asbestos Cement Pipe followed by properly disposing of the material at a state/federally approved disposal area.

http://www.epa.gov/Region4/air/asbestos/demolish.htm.

OSHA Subpart Z, 29 CFR 1926.1101

USEPA considers asbestos-cement pipe to be a "facility component" (as defined in 40 CFR 61.141) of the facility which owns or utilizes the pipe. In addition, USEPA considers asbestos-cement pipe to be Category II nonfriable asbestos containing material. This material becomes "regulated asbestos containing material" (RACM), as defined in 40 CFR 61.141, when it becomes "friable asbestos material" or when it "has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material during the course of demolition or renovation operations regulated by [40 CFR Part 61 Subpart M]." Consequently, the crushing of asbestos-cement pipe with mechanical equipment will cause this material to become RACM. The demolition and renovation provisions in 40 CFR 61.145 and the waste disposal provisions in 40 CFR 61.150 apply to asbestos-cement pipe where the pipe is considered RACM, and the amount of pipe being removed and crushed is at least 260 linear feet for a single renovation project or during a calendar year for individual nonscheduled operations.