

**C**losure of a manure storage facility may require several specific considerations. To follow the proper procedures, check the requirements in your state.

## Closure of Earthen Impoundments

Earthen manure storage impoundments may be abandoned for a number of reasons. These reasons may include termination of the livestock production enterprise, financial hardship or bankruptcy, or a change in the way manure is handled in the manure management system. Regardless of the reason, abandoned earthen manure storage facilities represent a potential environmental concern.

### Regulations

Some states may have specific regulations regarding earthen impoundments no longer used for manure storage and treatment. Regulations may include some or all of the following primary elements:

- Management of impoundment before closure
- Removal of impoundment contents
- Land application of impoundment contents
- Impoundment closure
- Conversion to farm pond

**Management of impoundment before closure.** There is often an interim period when animals are no longer produced and manure is not being introduced into the lagoon. During this period, the lagoon should be managed and maintained in accordance with normal recommended practices. Overflow or discharge must not be allowed, and the contents should be land applied in accordance with good agronomic practice.

**Removal of impoundment contents.** An earthen impoundment closure plan (if required) will include partial or complete removal of the impoundment contents. This operation can be quite challenging due to the materials to be removed. The contents usually include some relatively dilute liquid, some slurry, and some sludge accumulation. The dilute liquid and slurry portions can usually be agitated and removed with pumping equipment. Complete sludge removal may be difficult due to the highly viscous nature of the sludge and difficulty in maneuvering within the impoundment with the necessary equipment. Preservation of the existing impoundment seal may be more important than complete sludge removal.

**Land application of impoundment contents.** A closure plan should include land application of the nutrients according to an accepted nutrient management plan. Lagoon sludges are especially rich in accumulated phosphorus, and land area requirements may be based on phosphorus rather than nitrogen. An attempt should be made to estimate nutrients to be removed during closure. This requires probing the impoundment to determine sludge levels, analyzing sludge and liquid samples, and calculating nutrients based on relative volumes of sludge and liquid. This information may be required by the regulatory agency for approval of a closure plan.

**Impoundment closure.** After emptying, the impoundment should be filled with soil and landscaped in accordance with the original land contours. Fill material and compaction should be sufficient so settling and ponding do not occur. Surface water should be diverted from the site, and a growing crop or sod should be established on the fill's surface.

**Conversion to farm pond.** Regulations may allow conversion of the impoundment to a farm pond. Water quality characteristic of a farm pond may be difficult to achieve if some solids remain in the impoundment. "Rinsing" the impoundment by filling with fresh water and pumping as with lagoon effluent (several times may be required) may be necessary to achieve water

quality sufficient to support aquatic life and be suitable for discharge. Structural and operational features may need to be added, such as a principal and/or emergency spillway. Since most earthen manure impoundments are located on a site that minimizes surface water, sufficient watershed may not be available for optimum pond performance.

Some states may require that a management plan for closure of a manure impoundment be developed and submitted for approval by the regulatory agency before closure activities are begun.