**Section 506.204 Lagoon Design Standards**

a) The owner or operator of *any livestock waste lagoon subject to* this Subpart must *construct or modify* the lagoon *in accordance with*:

1) *"Design of anaerobic lagoons for animal waste management",* ASAE Engineering Practice 403.2; *or the guidelines published by the United States Department of Agriculture's Natural Resource Conservation Service titled "Waste Treatment Lagoon"*, which are incorporated by reference in Section 506.104; and

2) The additional design standards specified in subsections (c) through (h). [510 ILCS 77/15(a)]

b) *The department may require changes in design or additional requirements to protect groundwater, such as extra liner depth or synthetic liners, when it appears groundwater could be impacted.* [510 ILCS 77/15(a)]

c) The owner or operator must conduct a site investigation in compliance with Section 506.202 to determine if aquifer material is present (or not present) within 50 feet of the planned bottom of the lagoon.

d) The owner or operator must, as a part of the lagoon design, include the use of a liner and implement groundwater monitoring according to the following conditions:

1) If the uppermost aquifer material is located above or within 20 feet of the lowest point of the planned lagoon bottom (as measured from the top of any proposed liner), then the lagoon design must include both a liner and groundwater monitoring.

2) If the uppermost aquifer material is located between 20 to 50 feet from the lowest point of the planned lagoon (as measured from the top of any proposed liner), then the lagoon design must include a liner, but no groundwater monitoring is required.

3) If no aquifer material is located within 50 feet from the lowest point of the planned lagoon (as measured from the top of any proposed liner), then the lagoon design does not require a liner or groundwater monitoring.

e) If the owner or operator determines that a liner is required for the lagoon under this Section, the design of the lagoon must include an in-situ soil liner, borrowed clay or clay/bentonite mixture, or a synthetic liner in compliance with Section 506.205.

f) If the owner or operator determines that groundwater monitoring is required for the lagoon under this Section, the design of the lagoon must implement a groundwater monitoring program in compliance with Section 506.206 and 8 Ill. Adm. Code 900.Subpart F.

g) Any livestock waste lagoon subject to this Part must meet or exceed the following:

1) Berm:

A) The minimum berm-top width must be 8 feet;

B) The berm may contain no outlet piping that extends through the berm unless the piping discharges to another lagoon or is a component of a recirculating flush system;

2) Berm slope:

A) Exterior and normally exposed interior (above the liquid level elevation corresponding to the summation of the sludge volumes and minimum design volume) earthen walls must have side slopes not steeper than a 3 to 1 ratio of horizontal to vertical and a vegetative cover must be established on any exposed berm areas and kept mowed or otherwise maintained to eliminate erosion or other berm deterioration;

B) Interior berm earthen walls below the liquid level elevation corresponding to the summation of the sludge volumes and minimum design volume must have side slopes not steeper than a 3 to 1 ratio of horizontal to vertical or, if designed by a Licensed Professional Engineer and maintained to eliminate berm deterioration, a 2 to 1 ratio of horizontal to vertical;

3) The lagoon's total design volume must be at least the volume calculated as the summation of the following:

A) A minimum design volume, as calculated under subsection 5.4.1.1, ASAE EP403.2, ASAE Standards 1998, pp. 656-659;

B) A livestock waste volume, that must be sufficient to store the waste generated by the facility for at least 270 days as determined in ASAE EP403.2, ASAE Standards 1998, p. 656;

C) Runoff and washdown volumes generated during a 270-day period, including all runoff and precipitation from lots, roofs, or other surfaces where collected precipitation is directed into the lagoon, plus the volume of any washdown liquids used within the facility that are also directed into the lagoon. In no case must this volume be less than the precipitation and runoff generated by a 25-year, 24-hour storm event and directed to the lagoon; and

D) A sludge accumulation volume, as calculated under subsection 5.4.1.4, ASAE EP403.2, ASAE Standards 1998, p. 658;

4) In addition to the lagoon's total design volume, a freeboard must be provided as follows:

A) For lagoons serving a livestock management facility with a maximum design capacity of less than 300 animal units and not collecting runoff from areas other than the exposed surface of the lagoon (including associated interior berm slopes and flat berm-top areas), the top of the settled embankment must be at least 1 foot above the fluid surface level of the lagoon total design volume; or

B) For all other lagoons, the top of the settled embankment must be at least 2 feet above the fluid surface level of the lagoon total design volume;

5) Subsurface drainage lines in the immediate area of the livestock waste lagoon must be removed or relocated to provide for a minimum separation distance of at least 50 feet between the outermost extent of the lagoon (exterior toe of the berm) and the subsurface drainage line;

6) The minimum separation distance between the outermost extent of a lagoon (exterior toe of the berm) and any potential route of groundwater contamination, as defined in the Illinois Environmental Protection Act [415 ILCS 5] must be at least 100 feet. In addition, the minimum separation distance between the outermost extent of a lagoon (exterior toe of the berm) and a non-potable well, an abandoned or plugged well, a drainage well, or an injection well must be at least 100 feet;

7) The design and construction of the lagoon must include the installation of a lagoon liquid level board or staff gauge within the interior of the liquid storage volume. The liquid level board or staff gauge must include a mark at the liquid level elevation corresponding to the summation of the sludge volume and minimum design volume and must be designated as the "STOP PUMPING" elevation. The liquid level board or staff gauge must also be marked at the liquid level elevation corresponding to the summation of the sludge volume, minimum design volume, runoff and washdown volumes, and livestock waste volume and must be designated as the "START PUMPING" elevation;

8) *The livestock waste supply to a single-stage lagoon must be below the minimum design volume level* [510 ILCS 77/25(b)(2)]; and

9) The location of the lagoon and the associated livestock management facility must comply with all setback provisions of the Illinois Environmental Protection Act [415 ILCS 5], the Livestock Management Facilities Act [510 ILCS 77], and the rules promulgated thereunder.

h) *The owner or operator of the earthen livestock lagoon may, upon written request and with* written *approval from the Department, modify or exceed these standards in order to meet site specific objectives*. [510 ILCS 77/15(a)] The owner or operator must demonstrate that such modification is at least as protective of the groundwater, the surface water, and the structural integrity of the livestock waste management facility as the requirements of this Part.

(Source: Amended at 48 Ill. Reg. 3274, effective February 15, 2024)