

901:10-2-03

**Geological explorations.**

(A) A subsurface geological exploration shall be conducted prior to installing a fabricated structure. A subsurface geological exploration for a liquid manure fabricated structure shall be conducted under the supervision of an engineering geologist or a professional engineer. A subsurface geological exploration shall determine the following:

(1) For solid manure.

(a) Evaluate the suitability of the soil to provide the appropriate load bearing strength for the proposed fabricated structure by use of a soil survey, well logs, or the Ohio department of natural resources, division of water, ground water pollution protection (DRASTIC) maps, or by a geological exploration conducted in accordance with this rule;

(2) For liquid manure.

(a) Place a minimum of two test pits or borings at regular intervals within a reasonable distance of the boundaries of the fabricated structure, unless more test pits or borings are required by the professional engineer or engineering geologist. The test pits or borings shall extend a minimum of five feet below the planned bottom of the fabricated structure.

(b) Evaluate the suitability of the soil to provide the appropriate load bearing strength for the proposed fabricated structure as set forth in the appendix to rule 901:10-2-05 of the Administrative Code.

(c) Determine soil strength values so that lateral earth pressures can be calculated as set forth in the appendix to rule 901:10-2-05 of the Administrative Code.

(d) Whether the proposed fabricated structure is to be located within a karst area; and

(e) Ground water quality characteristics. Unless the facility is served by a public water system as defined by paragraph (UUU) of rule 901:10-1-01 of the Administrative Code, one of the following actions will be performed to characterize ground water:

(i) Ground water shall be sampled from a well existing at the facility that is properly installed, located, protected and operated to establish baseline ground water quality; or

(ii) In the event that a well does not already exist at the facility, then the owner or operator shall install a well at the facility that is properly located, protected and operated. The well shall be easily accessible for sampling with an adequate water quantity for

sampling.

(B) Prior to installing a manure storage pond or manure treatment lagoon, a subsurface geological exploration shall be conducted under the supervision of an engineering geologist or a professional engineer for the storage pond or treatment lagoon.

(1) A subsurface geological exploration shall be conducted on each new or expanding manure storage pond or manure treatment lagoon.

(2) The subsurface geological exploration shall be performed within a reasonable distance of the manure storage pond or manure treatment lagoon boundaries, shall include a minimum of four test pits or borings placed at regular intervals and shall determine the following:

(a) The type and hydraulic conductivity of the soil material present from the ground surface to a depth of five feet below the planned bottom of the manure storage pond or manure treatment lagoon;

(b) Suitability of soil material to provide adequate sealing of the bottom of the manure storage pond or manure treatment lagoon and construction of planned embankments;

(c) Whether the proposed manure storage pond or manure treatment lagoon is to be located within a karst area;

(d) Ground water shall be sampled from a well existing at the facility that is properly installed, located, protected and operated to establish baseline ground water quality. In the event that a well does not already exist at the facility, then the owner or operator shall install a well at the facility that is properly located, protected and operated. The well shall be easily accessible for sampling with an adequate water quantity for sampling;

(e) The exploration pits or borings shall extend a minimum of five feet below the planned bottom of the manure storage pond or manure treatment lagoon. Upon completion, any boring or pit used for sampling shall be properly plugged and sealed. Any pit used for sampling that is within the construction boundaries of the concentrated animal feeding facility, the manure storage pond or the manure treatment lagoon shall be restored by the addition of soil compacted in lifts no greater than six inches;

(f) Based on the results of the subsurface geological exploration and determinations by the engineering geologist, professional engineer or the director, additional tests may be required to determine the potential need for a liner and, if necessary, the type of liner to be installed; and

(g) The department may require additional subsurface geological explorations

depending on the soils and geological formations on site to ensure the protection of the groundwater, surface water or the structural integrity of the manure storage pond or manure treatment lagoon. The subsurface geological exploration shall refer to the Ohio department of natural resources, division of water ground water pollution protection (DRASTIC) maps to determine the pollution potential for each site, the pathways of contamination, if any, and whether additional liners are needed to protect water and groundwater.

(C) The results of subsurface geological explorations performed in accordance with paragraphs (A) and (B) of this rule shall be included in a report submitted with the facility design plans.

(1) The report shall include but not be limited to:

(a) Location of a facility well, exploration pits and borings plus locations and depths of soil samples;

(b) Available Ohio department of natural resources division of water, water well logs of wells located within a minimum of one thousand feet of the planned manure storage or treatment facility;

(c) Geologic information using either the group classification system by the American association of state highway and transportation officials or the unified soil classification system appended to this rule;

(d) Evidence of seepage or groundwater conditions and depths in pits;

(e) Determination of the suitability of in-situ soils for the planned facility, or lining recommendations when the in-situ soils are not suitable;

(f) Recommendation from the laboratory analysis of the compactive effort or soil density, and soil moisture requirements needed during construction to achieve design hydraulic conductivity;

(g) The results of the soil tests; and

(h) An analysis or evaluation that demonstrates that the information provided meets the requirements of rules 901:10-2-01 to 901:10-2-06 of the Administrative Code, and as follows for applicable type of manure storage and treatment facility:

(i) For a solid manure fabricated structure, an analysis or evaluation shall provide the information required by paragraphs (C)(1)(a), (C)(1)(b), (C)(1)(c), and (C)(1)(h) of this rule.

(ii) For a liquid manure fabricated structure, an analysis or evaluation

shall provide the information required by paragraphs (C)(1)(a), (C)(1)(b), (C)(1)(c), (C)(1)(d), (C)(1)(g) and (C)(1)(h) of this rule.

(iii) For a manure storage pond or manure treatment lagoon, an analysis or evaluation shall provide the information required by paragraphs (C)(1)(a) to (C)(1)(g) of this rule.

(2) Based on the results of the tests of this rule the professional engineer, engineering geologist, or director may require additional explorations that may include laboratory testing of soils and additional ground water monitoring wells.

(D) Laboratory testing and analysis:

(1) Soil samples taken during the subsurface geological exploration shall be tested in accordance with approved or certified soil testing procedures..

(2) Tests and results reported shall include, but not be limited to, hydraulic conductivity, dry unit weight, Atterberg Limits, and standard compaction with recompaction to achieve design hydraulic conductivity.

(E) Upon request by the owner or operator and subsequent written approval from the department field changes may be made in order to meet site-specific conditions during construction. The owner or operator shall demonstrate that such changes shall be at least as protective of the groundwater, surface water and the structural integrity of the manure storage or treatment facility as requirements of this chapter.

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