3745-512-21 **Recompacted soil liner test pad certification.**

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, test methods, federal rules, and federal statutory provisions referenced in this rule, see rule 3745-500-03 of the Administrative Code titled "Incorporation by reference."]

(A) The owner or operator shall construct a test pad, perform testing, and submit a test pad certification report in accordance with this rule prior to construction of the recompacted soil liner. The director, or for a C&DD facility the concurring authority, may approve an alternative to a test pad provided the recompacted soil liner can attain the hydraulic conductivity specification established in the applicable program chapter.

(B) The construction of the recompacted soil liner shall be modeled by the owner or operator using an approved test pad. The test pad shall be used to determine the construction details required to attain the hydraulic conductivity specification applied to the recompacted soil liner by the program chapter. The test pad shall be constructed as many times as necessary to meet the hydraulic conductivity criterion. The test pad shall be used to establish a set of parameters for certification of the soils to be used in the construction of the recompacted soil liner. A test pad shall be constructed whenever there is a significant change in soil material properties or whenever the owner or operator would like to amend the construction details. The test pad shall meet the following criteria:

(1) Be designed so that the proposed tests will yield valid results.

(2) Be of sufficient size to perform valid field hydraulic conductivity testing with a width at least three times the width of compaction equipment and a length at least two times the length of compaction equipment, including power equipment and any attachment.

(3) Have a thickness of not less than thirty inches.

(4) Be constructed using not less than six lifts.

(5) Be constructed with soil that meets the criteria established in paragraph (B) of rule 3745-512-20 of the Administrative Code.

(C) The owner or operator shall perform pre-construction testing on representative samples of the soils used to construct the test pad at a frequency of not less than twice per lift for the following:

(1) Maximum dry density and optimum moisture content according to ASTM D698 (standard proctor) when using compaction equipment applying an approximate

compactive effort of twelve thousand four hundred foot-pounds per cubic foot or ASTM D1557 (modified proctor) when using compaction equipment applying an approximate compactive effort of fifty-six thousand foot-pounds per cubic foot.

(2) Grain size distribution using ASTM D422 (sieve and hydrometer).

(3) Atterberg limits using ASTM D4318.

(D) The owner or operator shall perform construction testing on the constructed lifts of the test pad to determine the density and moisture content according to ASTM D6938 (nuclear method), ASTM D1556 (sand cone), ASTM D2167 (rubber balloon), or ASTM D6780 (TDR) at a frequency of not less than three tests per lift. The locations of the individual tests shall be adequately spaced to represent the constructed area and shall be offset from one lift to the next lift. Any penetration shall be repaired using bentonite.

(E) The owner or operator shall perform post-construction testing on the test pad to determine field hydraulic conductivity using one of the following:

(1) ASTM D6391 (two stage borehole).

(2) ASTM D3385 (double ring infiltrometer).

(3) ASTM D5093 (sealed double ring infiltrometer).

(F) The recompacted soil liner construction details established by test pad construction and testing shall include the following:

(1) The maximum loose lift thickness.

(2) The minimum soil moisture content, which shall be not less than the optimum moisture content as determined by ASTM D698 (standard proctor) or ASTM D1557 (modified proctor). The director, or for a C&DD facility the concurring authority, may approve an alternative construction detail for minimum soil moisture content provided use of the alternative construction detail results in a recompacted soil liner that meets the hydraulic conductivity specification established in the applicable program chapter.

(3) The minimum soil dry density, which shall be not less than ninety-five per cent of the maximum dry density as determined by ASTM D698 (standard proctor) or shall be at least ninety per cent of the maximum dry density as determined by ASTM D1557 (modified proctor). The director, or for a C&DD facility the concurring authority, may approve an alternative construction detail for minimum soil dry density provided use of the alternative construction detail

results in a recompacted soil liner that meets the hydraulic conductivity specification established in the applicable program chapter.

(4) The specific type and weight of compaction equipment used to compact the test pad soils.

(5) The minimum number of passes of the compaction equipment. For the purposes of this paragraph, one pass is defined as a single contact of the compactor over an area.

(G) The owner or operator shall include the following in a test pad certification report:

(1) Certification that construction of the test pad was in accordance with paragraph (B) of this rule.

(2) The soil property acceptance criteria for the following that will be used to construct the recompacted soil liner:

(a) The maximum dry density and optimum moisture content.

[Comment: Density and moisture content construction limits are also established through shear strength testing in accordance with rule 3745-512-10 of the Administrative Code. Acceptance criteria for construction of recompacted soil liner may need to be adjusted for purposes of meeting both shear strength and permeability criteria.]

(b) The grain size distribution.

(c) The atterberg limits.

(3) The results of all the testing required by paragraphs (C) to (E) of this rule.

(4) Proposed recompacted soil liner construction details established in accordance with paragraph (F) of this rule.

(5) The signature and seal of a professional engineer.