

RESPONSE 45

TABLE III-3F-2: Soil Liner Construction Testing Schedule

TEST	METHOD	PARALLEL LIFTS MINIMUM FREQUENCY ⁽¹⁾⁽⁵⁾⁽⁶⁾	HORIZONTAL LIFTS MINIMUM FREQUENCY ⁽²⁾⁽⁵⁾⁽⁶⁾
Field Moisture/ Density Test	ASTM D6938, D2937, or D1556	1 per 8,000 ft ² , 3 minimum, per 6-inch lift for each monolithic liner section	1 per 100 linear feet per 12-inch height of clay berm
Percent Finer Than No. 200 Sieve	ASTM D1140 or D422	1 per 100,000 ft ² , 1 minimum, per 6-inch lift for each monolithic liner section	1 per 2,000 lineal feet per 12 inches of clay berm (horizontal lifts) ⁽⁴⁾
Atterberg Limits	ASTM D4318	1 per 100,000 ft ² , 1 minimum, per 6-inch lift for each monolithic liner section	1 per 2,000 lineal feet per 12-inches of clay berm (horizontal lifts) ⁽⁴⁾
Hydraulic Conductivity ⁽³⁾	ASTM D5084	1 per 100,000 ft ² , 1 minimum, per 6-inch lift for each monolithic liner section	1 per 2,000 lineal feet per 12-inches of clay berm (horizontal lifts) ⁽⁴⁾

Notes:

1. For bottom liner and sidewall liner placed parallel to the slope.
2. For clay berm constructed with horizontal lifts.
3. Testing procedures in Appendix VII of the US Army Corps of Engineers Manual EM 1110-2-1906, November 30, 1970, Laboratory Soils Testing, may be used as an alternative method. Permeability tests will be conducted using tap water or 0.05N calcium sulfate solution as the permeant fluid. Distilled or deionized water is not acceptable.
- ~~3. Testing shall be conducted on undisturbed samples. Testing procedures in Appendix VII of the US Army Corps of Engineers Manual EM 1110-2-1906, November 30, 1970, Laboratory Soils Testing, may be used as an alternate.~~
4. For tall, but lengthwise short sections constructed with horizontal lifts, the frequency of tests may be great. Owner may consult with the TCEQ on a case-by-case basis prior to construction for approval to reduce the frequency.
5. A voluntary increase in the number of any tests performed does not in turn require a commensurate increase in the other testing requirements to meet the above program.
6. A minimum of one of each of the designated tests must be conducted for each lift of liner regardless of surface area.

Typically, field moisture-density tests will be performed using a nuclear density gage (ASTM D6938). Other acceptable test methods include the Sand Cone Method (ASTM D1556) or Drive Cylinder Test (ASTM D2937). Questions concerning the accuracy of any single field moisture-density test shall be addressed by retesting in the same general location. Periodic checks using the various test methods may be performed to verify the field moisture-density test results. Alternatively, field moisture-density checks may be performed using laboratory measurements of tube samples obtained adjacent to the field test locations.

The percent finer than No. 200 Sieve, Atterberg Limits, and hydraulic conductivity tests will be performed on samples generally obtained with a thin-walled tube sampler. If more material is needed, the extra material can be obtained from cuttings at the same location. These construction test samples will be obtained from the recently completed lift, taken one lift at a time, so that sample penetrations only go through one lift and do not penetrate from one lift into the next. Undisturbed samples will generally be sent