NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

POND SEALING OR LINING

SOIL DISPERSANT

(No.)

CODE 521B

DEFINITION

A liner for a pond or waste impoundment consisting of a compacted soil-dispersant mixture.

PURPOSE

To reduce seepage losses from ponds or waste impoundments for water conservation and environmental protection.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where:

- Soils are suitable for treatment with dispersants.
- Ponds or waste storage impoundments require treatment to reduce seepage rates and impede the migration of contaminants to within acceptable limits.

CRITERIA

In New Mexico, this practice standard does not apply to waste impoundments.

All structures to be lined with soil dispersant treatment must have been constructed to at least the minimum requirements stated in NRCS Conservation Practice Standards, 378 – Pond, 313 - Waste Storage Facility, or 359 – Waste Treatment Lagoon, and all other applicable NRCS standards.

General Criteria Applicable to All Purposes

Dispersant treated soil liners shall comply with all federal, state, and local laws, rules, and regulations.

Filter. Dispersant treated soil liners shall be filter compatible with the natural foundation materials on which they are compacted according to Chapter 26, Part 633 of the National Engineering Handbook.

Dispersant. The dispersant shall be tetrasodium pyrophosphate, (TSPP), sodium tripolyphosphate (STPP), or soda ash, unless laboratory tests determine that other dispersants are acceptable and are approved by the State Conservation Engineer.

When a laboratory permeability test is required to determine application rate of a dispersant, the test shall be performed using a dispersant of the same quality and fineness as that proposed for use.

Side Slope. The interior slopes of the structure shall not be steeper than three horizontal to one vertical (3:1)

Liner Protection. The liner shall be protected against desiccation cracking, the effects of water surface fluctuations, wave action, surface and pipe inlet erosion, and erosion from agitation equipment, animals, or items installed through the liner. At least 6 inches of protective compacted soil cover shall be placed over the finished compacted soil-dispersant liner.

Safety. All personnel on site during dispersant mixing and application shall wear mask and goggles for protection against dispersant dust.

Criteria Applicable To Ponds

Design. Dispersant treated soil liners for ponds not storing animal waste shall be designed to reduce seepage to rate that will allow the pond to function suitably as intended.

Application Rate. For ponds, in the absence of laboratory tests or field performance data on

soils similar to those to be treated, the minimum application of dispersant per 6-inch thickness of constructed liner shall be:

Dispersant Type	Application rate (lb./ 100 ft^2)
Polyphosphates	7.5
Soda Ash	15

Liner Thickness. In the absence of more detailed testing and analyses, liner thickness shall be according to the following table:

Water Depth (feet)	Liner Thickness (inches)
8 or less	6
8.1 – 16	12
16.1 – 24	18
24.1 - 30	24

Criteria Applicable To Waste Impoundments

Design. Design of dispersant treated soil liners for waste storage impoundments shall be designed to reduce specific discharge (unit seepage) to rates recommended in the National Engineering Handbook Series, Part 651, Agricultural Waste Management Field Handbook (AWMFH), Chapter 10, Appendix 10D or rates mandated in state regulations if they are more restrictive. Lower specific discharge rates may be used at the discretion of the Designer.

Liner Thickness. The minimum thickness of the finished compacted liner shall be the greater of:

1. that required to achieve a specific discharge (unit seepage) design value selected by the designer,
2. that required by state regulations, or
3. that given in the following table. The water depth to be used in the table is the normal full pool storage depth in the impoundment.

Water Depth (feet)	Liner Thickness (inches)
≤ 16	12
16.1 – 24	18
> 24	24

Other Criteria

Liner Construction. Use methods described in Appendix 10D to the AWMFH for liner construction.

Liner Protection. Dispersant treated soil liners shall be protected against damage caused by the effects of water surface fluctuations, desiccation and cracking, wave action, rainfall during periods when the liner is exposed, water falling onto the liner from pipe outlets, agitation equipment, solids and sludge removal activity, animal activity, penetrations through the liner, and any other activity capable of causing physical damage to the liner.

Design should include measures to protect against damage to the dispersant treated soil liner due to uplift water pressures if a seasonal high water table occurs at a level above that of the lowest potential level of liquid in the impoundment. Examples of protective design measures are the use of perimeter drains to lower the water table, maintaining minimum liquid depth in the impoundment, and using liners thick enough to resist uplift water pressures.

Protection of the finished liner from the effects of desiccation during periods when the pond or impoundment is low or empty is advisable. A protective soil cover may be considered. The soil cover shall be of a soil type, thickness, and density that is resistant to erosion and desiccation.

Side Slopes. The side slopes of ponds or waste storage impoundments should be 3H: 1V or flatter to facilitate mixing of the dispersant when the bathtub method of construction as described in Appendix 10D, AWMFH, is used. Slopes as steep as 2H: 1V can be considered if the stair-step method of construction as described in Appendix 10D to the AWMFH is used. Maintenance requirements should also be considered when selecting a side slope.

CONSIDERATIONS

To facilitate compaction during construction, consider flattening the embankment slopes of ponds or waste impoundments versus the stair-step method as outlined in Part 651, Agricultural Waste Management Field Handbook, Appendix 10D.

to facilitate compaction efforts during construction should be considered. The stair-step method of construction as outlined in Appendix 10D.

Consider using a flexible membrane liner for sites that have water depths greater than 24 feet.

PLANS AND SPECIFICATIONS

Plans and specifications for dispersant treated soil liners for ponds and waste impoundments shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Plans and specifications shall include such drawings, specifications, material requirements, quantities, construction requirements, equipment requirements, and other documents as are necessary to describe the work to be done.

OPERATION AND MAINTENANCE

Maintenance activities required for this practice consist of those operations necessary to prevent damaging the treated soil liner.

Protect the liner during filling or agitation operations.

Sediment coagulating materials, such as, gypsum or iron sulfate, shall not be used to clear reservoir water.

Maintain the soil covering at the construction depth.

Limit the use or travel of any equipment in the area that was sealed.

Prevent all livestock from entering the sealed area of the pond.

All exclusion fences must be maintained to prevent unwanted entry.

Investigate the cause of any settlement or cracks.

Eliminate all burrowing animals or rodents.

Repair any vandalism, vehicle, or livestock damage.