

Pond Sealing or Lining - Flexible Membrane

Alabama Job Sheet No. AL521A



DEFINITION

A flexible membrane is a manufactured hydraulic barrier consisting of a functionally continuous sheet of synthetic, or partially synthetic, flexible material. Materials commonly used as pond liners are: High Density, Linear Low Density, and Reinforced Linear Low Density Polyethylene (HDPE, LLDPE, and LLDPE-R), Polyvinyl Chloride (PVC), Geosynthetic Clay Liner (GCL), synthetic rubber (EPDM), Flexible and Reinforced Flexible Polypropylene Geomembrane (FPP and FPP-R) and Reinforced, Slit-Film, Woven Polyethylene Geomembrane (PE-R).

GENERAL INFORMATION

HDPE, LLDPE, LLDPE-R, PVC, EPDM, FPP, FPP-R, and PE-R liners are fabricated of separate panels that are joined by thermal or chemical fusion methods. Specialized equipment and skilled installers are required for proper seaming and installation. All seams must be tested and certified. For these reasons, installation of plastic and rubber membranes is generally beyond the capabilities of on-farm laborers. GCLs consist of a thin layer of bentonite clay sandwiched between two layers of nonwoven geotextile. Continuous liners of GCL are made by overlapping the edges of adjacent panels and placing granular bentonite between the overlapped sheets. Installation of GCL liners is less complicated than plastic or rubber liners but still must be done under the supervision of knowledgeable and experienced personnel. PVC and GCL liners require a cover of soil to protect the material from drying after installation and to ensure proper functioning of the liner. Soil cover layers are sometimes used on plastic and rubber liners for protection also.

The surface of the soil on which the membrane is to be placed must be smooth, compacted and free of clods, stones, roots, sticks, or other objects that could puncture or tear the membrane. Cover soils must also be free of

objects that would puncture the liner material. The liner should be protected from sharp angular stones or objects and particles greater than 3/8" in size for plastic or rubber liners or 1/2" for GCL's.

Gas from organic material or other sources can sometimes build up underneath membranes causing the liner to float to the surface of the pond. Provisions for venting the gas from beneath the liner must be provided when it is suspected that this may be a problem. A high ground water table could also cause damage to the liner. This would be of greatest concern in waste storage ponds that are emptied periodically. Relief drains must be installed where this could be a problem.

The contents of waste storage ponds must often be agitated to facilitate complete pump out. Concrete pads or other features must be provided to prevent damage to the liner from agitation equipment. Supports for equipment, inflow and outflow pipes, pumps, and other devices must be designed and installed to prevent leakage at these structures.

Ponds with uncovered synthetic liners present an additional safety concern over unlined ponds. The steep sides of the pond and slick surface of liner materials make it very difficult for humans or animals to climb from the pond. Wooden boards on the liner slopes should be considered to allow small animals to climb from the water. Ropes attached to posts and spaced at regular intervals around the perimeter of the pond will provide a means for humans to climb from the pond. Lined structures should be fenced for safety and to prevent damage to the liner from livestock, wildlife, and pets.

OPERATION AND MAINTENANCE

Flexible membranes must be protected during filling, agitation, and pumping operations. Animals must be excluded from the liner. Repairs must be made when damage to the liner occurs.

REFERENCES

NRCS AL Conservation Practice Standards:

Pond - Code 378

Pond Sealing or Lining (Flexible Membrane) – Code 521A

Waste Storage Facility – Code 313

Waste Treatment Lagoon – Code 359

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Pond Sealing or Lining - Flexible Membrane Worksheet

Land User: _____ County: _____ Date: _____

Farm No.: _____ Tract No. : _____ Assisted by: _____

Pond size: Length _____ Width _____ Depth _____

Pond liner material:

_____ High Density Polyethylene (HDPE)

_____ Linear Low Density Polyethylene (LLPDE)

_____ Reinforced Linear Low Density Polyethylene (LLPDE-R)

_____ Polyvinyl Chloride (PVC)

_____ Geosynthetic Clay Liner (GCL)

_____ Synthetic Rubber (EPDM)

_____ Flexible Polypropylene Geomembrane (FPP)

_____ Reinforced Flexible Polypropylene Geomembrane (FPP-R)

_____ Reinforced, Slit-Film, Woven Polyethylene Geomembrane (PE-R)

Pond liner thickness: _____ mil

Depth of cover soil if required: _____ in.

Cover soil compaction requirements: _____

Provisions for venting gas beneath liner: _____

Provisions for protection from damage during pond drainage or pump out: _____