

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

POND SEALING OR LINING - FLEXIBLE MEMBRANE

(No.)
Code 521A



DEFINITION

A manufactured hydraulic barrier consisting of a functionally continuous sheet of synthetic or partially synthetic, flexible material.

PURPOSE

To control seepage from water and waste impoundments for water conservation and environmental protection.

CONDITION WHERE PRACTICE APPLIES

On ponds and water storage structures that require treatment to control seepage rates within acceptable limits.

On waste storage and waste treatment facilities built in or of excavated earth, and which require treatment to prevent the migration of contaminants from the site.

CRITERIA

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

Construct all structures to be lined to meet all applicable NRCS standards. Install all inlets, outlets, ramps, and other appurtenances before, during, or after the liner placement and in a manner that does not damage or impair the proper operation of the liner.

Use flexible membranes that are certified by the manufacturer to be suitable for the intended use.

Design flexible membrane in accordance with manufacturer's recommendations. Design liner material to meet the minimum requirements in Table 1 and to meet or exceed the Florida NRCS Material Specification for Pond Sealing or Lining – Flexible Membrane, Code MS 521A. Install flexible membrane to meet the material and installation requirements of the plans and specifications provided for each installation. Installed flexible membrane shall be certified by the installer.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Table 1 - Minimum Criteria for Membranes

Type	Limiting Parameter
High Density Polyethylene (HDPE)	40 mil thickness
Linear Low Density Polyethylene (LLDPE)	40 mil thickness
Polyvinyl Chloride (PVC)	30 mil thickness
Geosynthetic Clay Liner (GCL)	0.75 lb./sq ft (bentonite)
Synthetic Rubber (EPDM)	45 mil thickness

Construct seams according to manufacturer's recommendations and test to assure water tightness. Place the bottom of the liner a minimum of one foot above seasonal high water table when used in a manure storage or treatment facility.

Use select soil materials as cover for liners where required for the proper performance, protection, and durability of the installation. Cover soils shall not contain sharp, angular stones or any objects that could damage the liner. Use soil cover material with the maximum allowable particle size of 3/8-in (10 mm), unless the liner is cushioned by a needle punched, non-woven geotextile. Stabilize cover materials under all operational and exposure conditions.

Prepare subgrade to manufacturer's recommendations. Use subgrade materials that do not contain sharp, angular stones or any objects that could damage the liner or adversely impact its function.

Fence all structures to protect the liner from damage and for the safety of humans, livestock, wildlife, and pets.

Equip a means of emergency egress for all facilities with exposed flexible membranes. For those facilities with intended access points, provide emergency egress at each access point.

Follow manufacturer's recommendations with regard to protection from weather and exposure.

If venting is used, follow manufacturer recommendations regarding vent type and spacing.

CONSIDERATIONS

Consider venting if gas build-up under the liner is anticipated.

If high water tables could adversely affect the proper functioning of the facility, consider interceptor or relief type drainage systems to control uplift pressures.

Consider including provision for the liner protection from damage during cleaning operations in designs.

If agitation equipment is to be used, consider installing a concrete pad to protect the liner.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for specific field sites in accordance with this standard and describe the requirements for applying the practice to achieve its intended uses.

As a minimum include the following in the plans and specifications:

- Plan view of system layout
- Foundation preparation
- Type and thickness of liner
- Method of installation
- Method to protect liner
- Structural details
- Drain and vent location and details
- Quantity of material

OPERATION AND MAINTENANCE

Maintenance activities required for this practice consist of those operations necessary to prevent damaging the liner. Include, but not limited to, exclusion of animals and equipment from the liner, protection of the liner during initial filling, agitation, or pumping operations, and reparation of the liner.

REFERENCES

Florida NRCS Material Specification Pond Sealing or Lining – Flexible Membrane MS 521A
General Manual
Title 420-Part 401
Title 450-Part401

**Field Office Technical Guide
Section IV**

Title 190-Parts 410.22 and 410.26
National Cultural Resources Procedures
Handbook
National Environmental Compliance Handbook
National Food Security Act Manual

**Pond Sealing or Lining – Flexible Membrane,
Code 521A - 3**

National Planning Procedures Handbook
Florida Supplements to Parts 600.1 and
600.6