Practice: 521C - Pond Sealing or Lining, Bentonite Sealant

Scenario: #1 - Bentonite Treatment, Uncovered

Scenario Description:

A compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. Bentonite is incorporated with the soil under proper moisture conditions and compacted to designed liner thickness. Bentonite treated soil liner may require additional filter compatibility requirements with the subgrade (graded filter or geotextile) as described in the NRCS, National Engineering Handbook.

Associated practices: Waste Storage Facility (313), Pond (378)

Before Situation:

Soils on-site exhibit seepage rates in excess of acceptable limits and are suitable for treatment with dispersants. If not lined, soils will allow the passage of nutrients and pathogens from the waste storage facility or pond negatively impacting water quality.

After Situation:

A compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. The liner is constructed 1 foot thick over a 1 acre area. The liner reduces or prevents seepage losses, which reduces the delivery of nutrients and pathogens to surface water.

Scenario Feature Measure: Volume of Liner Material

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,613

Scenario Cost: $74,626.04 **Scenario Cost/Unit:** $46.27

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$55.40	6	$332.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.39	1613	$7,081.07
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$42.74	2	$85.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$96.17	2	$192.34
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.43	6	$134.58
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$12.73	5227	$66,539.71
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$259.43	1	$259.43
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	$1.03	1	$1.03

Practice: 521C - Pond Sealing or Lining, Bentonite Sealant

Scenario: #2 - Bentonite Treatment, Covered

Scenario Description:

A compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. Bentonite is incorporated with the soil under proper moisture conditions and compacted to designed liner thickness. A soil cover is placed over the treated liner. Payment is based on the volume of liner material and the cost of soil cover is included in the payment. Bentonite treated soil liner may require additional filter compatibility requirements with the subgrade (graded filter or geotextile) as described in the NRCS, National Engineering Handbook. implementation may require filter compatibility with the subgrade (graded filter or geotextile).

Associated practices: Waste Storage Facility (313), Pond (378)

Before Situation:

Soils on-site exhibit seepage rates in excess of acceptable limits and are suitable for treatment with dispersants. If not lined, soils will allow the passage of nutrients and pathogens from the waste storage facility or pond negatively impacting water quality.

After Situation:

A compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. The liner is constructed 1 foot thick over a 1 acre area. A 1 foot soil cover is placed over the treated liner. The cost of installing the 1 foot cover is included in the payment of the treated material. The liner reduces or prevents seepage losses, which reduces the delivery of nutrients and pathogens to surface water.

Scenario Feature Measure: Volume of Liner Material (includes 1 foot of soil cover over liner)

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,613

Scenario Cost: $81,711.50 **Scenario Cost/Unit:** $50.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.39	3227	$14,166.53
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$55.40	6	$332.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.43	6	$134.58
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$42.74	2	$85.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$96.17	2	$192.34
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$12.73	5227	$66,539.71
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$259.43	1	$259.43
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	$1.03	1	$1.03