

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521A - Pond Sealing or Lining, Flexible Membrane
Scenario ID	1
Scenario Name	Flexible Membrane - Uncovered with liner drainage or venting
Scenario Description	Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage, and liner drainage or venting.
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.
Scenario Feature Measure	Surface area of Liner Material (including anchorage)
Scenario Unit	Square Yard
Scenario Typical Size	4840

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$44,673.20	\$9.23
Equipment/Installation	\$10,164.00	\$2.10
Labor	\$3,321.36	\$0.69
Mobilization	\$598.79	\$0.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$58,757.35	\$12.14

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1387	Synthetic Liner, 40 mil	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Materials only.	Square Yard	\$6.48	4840	\$31,363.20
Materials	1778	Geonet	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Materials only.	Square Yard	\$2.75	4840	\$13,310.00
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.10	4840	\$10,164.00
Labor	235	Specialist Labor	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	\$73.63	32	\$2,356.16
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.13	40	\$965.20
Mobilization	1141	Mobilization, Skilled labor	Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$22.97	1	\$22.97
Mobilization	1146	Mobilization, Specialist Labor	Mobilization of Specialist Labor. Includes Agronomists, Foresters, Biologists, etc.	Hour	\$75.82	1	\$75.82
Mobilization	1043	Mobilization, Material, distance > 50 miles	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 included in the component price.	Dollar	\$1.00	500	\$500.00

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521A - Pond Sealing or Lining, Flexible Membrane
Scenario ID	2
Scenario Name	Flexible Membrane - Covered with liner drainage or venting
Scenario Description	Installation of a flexible geosynthetic membrane liner to reduce seepage from waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, a geotextile or soil cushion to protect liner from subgrade damage, and liner drainage or venting.
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.
Scenario Feature Measure	Surface area of Liner Material (including anchorage)
Scenario Unit	Square Yard
Scenario Typical Size	4840

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$44,673.20	\$9.23
Equipment/Installation	\$15,648.20	\$3.23
Labor	\$3,321.36	\$0.69
Mobilization	\$598.79	\$0.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$64,241.55	\$13.27

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1387	Synthetic Liner, 40 mil	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Materials only.	Square Yard	\$6.48	4840	\$31,363.20
Materials	1778	Geonet	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Materials only.	Square Yard	\$2.75	4840	\$13,310.00
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.40	1613	\$5,484.20
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.10	4840	\$10,164.00
Labor	235	Specialist Labor	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	\$73.63	32	\$2,356.16
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.13	40	\$965.20
Mobilization	1141	Mobilization, Skilled labor	Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$22.97	1	\$22.97
Mobilization	1146	Mobilization, Specialist Labor	Mobilization of Specialist Labor. Includes Agronomists, Foresters, Biologists, etc.	Hour	\$75.82	1	\$75.82
Mobilization	1043	Mobilization, Material, distance > 50 miles	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 included in the component price.	Dollar	\$1.00	500	\$500.00

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521B - Pond Sealing or Lining, Soil Dispersant
Scenario ID	1
Scenario Name	Soil Dispersant - Uncovered
Scenario Description	Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions and compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile).
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.
Scenario Feature Measure	Volume of Liner Material
Scenario Unit	Cubic Yard
Scenario Typical Size	1613 Typical pond liner: 1 ft. thick x 1 acre in area

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$13,042.43	\$8.09
Equipment/Installation	\$5,879.47	\$3.65
Labor	\$557.12	\$0.35
Mobilization	\$633.99	\$0.39
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$20,113.01	\$12.47

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1490	Soil Dispersant	Soil Amendment (tetrasodium pyrophosphate (TSP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent)	Ton	\$1,997.31	6.53	\$13,042.43
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.47	1613	\$5,597.11
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	\$47.06	6	\$282.36
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hours	\$73.63	2	\$147.26
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	\$36.06	8	\$288.48
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	\$20.23	6	\$121.38
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.85	1	\$22.85
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$127.32	1	\$127.32
Mobilization	1043	Mobilization, Material, distance > 50 miles	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 included in the component price.	Dollar	\$1.00	408	\$408.00
Mobilization	1146	Mobilization, Consultant Services	Management of consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521B - Pond Sealing or Lining, Soil Dispersant
Scenario ID	2
Scenario Name	Soil Dispersant - Covered
Scenario Description	Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile).
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.
Scenario Feature Measure	Volume of Liner Material (includes 1 foot of soil cover over liner)
Scenario Unit	Cubic Yard
Scenario Typical Size	1613 Typical pond liner: 1 ft. thick with 1 ft. soil cover x 1 acre in area

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$13,042.43	\$8.09
Equipment/Installation	\$11,480.05	\$7.12
Labor	\$557.12	\$0.35
Mobilization	\$633.99	\$0.39
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$25,713.59	\$15.94

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1490	Soil Dispersant	Soil Amendment (tetrasodium pyrophosphate (TSP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent)	Ton	\$1,997.31	6.53	\$13,042.43
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.47	3227	\$11,197.69
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	\$47.06	6	\$282.36
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hours	\$73.63	2	\$147.26
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	\$36.06	8	\$288.48
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	\$20.23	6	\$121.38
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.85	1	\$22.85
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$127.32	1	\$127.32
Mobilization	1043	Mobilization, Material, distance > 50 miles	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 included in the component price.	Dollar	\$1.00	408	\$408.00
Mobilization	1146	Mobilization, Consultant Services	Management of consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521C - Pond Sealing or Lining, Bentonite Sealant
Scenario ID	1
Scenario Name	Bentonite Treatment - Uncovered
Scenario Description	Construction of a compacted soil liner, treated with bentonite, to reduce seepage from waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile).
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with bentonite.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from waste storage impoundments.
Scenario Feature Measure	Volume of Liner Material
Scenario Unit	Cubic Yard
Scenario Typical Size	1613 Typical pond liner: 1 ft. thick x 1 acre in area

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$26,840.65	\$16.64
Equipment/Installation	\$5,879.47	\$3.65
Labor	\$340.76	\$0.21
Mobilization	\$225.99	\$0.14
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$33,286.87	\$20.64

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	41	Bentonite	Bentonite, includes materials (50# bag)	Each	\$10.27	2613.5	\$26,840.65
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.47	1613	\$5,597.11
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	\$47.06	6	\$282.36
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	\$20.23	6	\$121.38
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	\$36.06	2	\$72.12
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hours	\$73.63	2	\$147.26
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$127.32	1	\$127.32
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.85	1	\$22.85
Mobilization	1146	Mobilization, Consultant Services	Management of consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521C - Pond Sealing or Lining, Bentonite Sealant
Scenario ID	2
Scenario Name	Bentonite Treatment - Covered
Scenario Description	Construction of a compacted soil liner, treated with bentonite, to reduce seepage from waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile).
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with bentonite.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from waste storage impoundments.
Scenario Feature Measure	Volume of Liner Material (includes 1 foot of soil cover over liner)
Scenario Unit	Cubic Yard
Scenario Typical Size	1613 Typical pond liner: 1 ft. thick with 1 ft. soil cover x 1 acre in area

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$26,840.65	\$16.64
Equipment/Installation	\$11,480.05	\$7.12
Labor	\$340.76	\$0.21
Mobilization	\$225.99	\$0.14
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$38,887.45	\$24.11

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	41	Bentonite	Bentonite, includes materials (50# bag)	Each	\$10.27	2613.5	\$26,840.65
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.47	3227	\$11,197.69
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	\$47.06	6	\$282.36
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	\$20.23	6	\$121.38
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	\$36.06	2	\$72.12
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hours	\$73.63	2	\$147.26
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$127.32	1	\$127.32
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.85	1	\$22.85
Mobilization	1146	Mobilization, Consultant Services	Management of consultant services to assist in resource inventory, plan development, site surveys, site monitoring, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521D - Pond Sealing or Lining, Compacted Clay Treatment
Scenario ID	1
Scenario Name	Material haul < 0.5 mile
Scenario Description	Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul < 0.5 mile. Subgrade excavation is not included with this scenario.
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material haul < 0.5 mile.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from ponds.
Scenario Feature Measure	Volume of Liner Material (including volume of soil cover, as needed)
Scenario Unit	Cubic Yard
Scenario Typical Size	2420 Typical liner 18" thick

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$8,049.12	\$3.33
Labor	\$2,856.40	\$1.18
Mobilization	\$928.87	\$0.38
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$11,834.39	\$4.89

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	1204	Tractor, agricultural, 260 HP	Agricultural tractor with horsepower range of 240 to 290. Equipment and power unit costs. Labor not included.	Hour	\$107.76	24	\$2,586.24
Equipment/Installation	1203	Tractor, agricultural, 160 HP	Agricultural tractor with horsepower range of 140 to 190. Equipment and power unit costs. Labor not included.	Hour	\$69.24	24	\$1,661.76
Equipment/Installation	1207	Scraper, pull, 15 CY	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	\$17.89	24	\$429.36
Equipment/Installation	928	Dozer, 200 HP	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$128.97	24	\$3,095.28
Equipment/Installation	1328	Roller, static, towed, tamping foot	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	\$11.52	24	\$276.48
Labor	235	Specialist Labor	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	\$73.63	16	\$1,178.08
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.31	72	\$1,678.32
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$238.15	3	\$714.45
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.10	6	\$138.60
Mobilization	1146	Mobilization, Specialist Labor	Mobilization of Specialist Labor. Includes Agronomists, Foresters, Biologists, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521D - Pond Sealing or Lining, Compacted Clay Treatment
Scenario ID	2
Scenario Name	Material haul > 0.5 mile
Scenario Description	Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul > 0.5 mile. Subgrade excavation is not included with this scenario.
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material haul > 0.5 mile.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from ponds.
Scenario Feature Measure	Volume of Liner Material (including volume of soil cover, as needed)
Scenario Unit	Cubic Yard
Scenario Typical Size	2420 Typical liner 18" thick

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$12,505.64	\$5.17
Labor	\$3,415.84	\$1.41
Mobilization	\$1,213.22	\$0.50
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$17,134.70	\$7.08

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	1204	Tractor, agricultural, 260 HP	Agricultural tractor with horsepower range of 240 to 290. Equipment and power unit costs. Labor not included.	Hour	\$107.76	24	\$2,586.24
Equipment/Installation	1203	Tractor, agricultural, 160 HP	Agricultural tractor with horsepower range of 140 to 190. Equipment and power unit costs. Labor not included.	Hour	\$69.24	24	\$1,661.76
Equipment/Installation	1207	Scraper, pull, 15 CY	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	\$17.89	24	\$429.36
Equipment/Installation	928	Dozer, 200 HP	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$128.97	24	\$3,095.28
Equipment/Installation	1619	Front End Loader, 185 HP	Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included.	Hour	\$69.73	24	\$1,673.52
Equipment/Installation	1615	Hauling, bulk, highway truck	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	\$0.23	12100	\$2,783.00
Equipment/Installation	1328	Roller, static, towed, tamping foot	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	\$11.52	24	\$276.48
Labor	235	Specialist Labor	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	\$73.63	16	\$1,178.08
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.31	96	\$2,237.76
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$238.15	4	\$952.60
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.10	8	\$184.80
Mobilization	1146	Mobilization, Specialist Labor	Mobilization of Specialist Labor. Includes Agronomists, Foresters, Biologists, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521D - Pond Sealing or Lining, Compacted Clay Treatment
Scenario ID	4
Scenario Name	Subgrade Excavation and Material Haul > 0.5 Mile
Scenario Description	Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from waste storage impoundment structures. Practice implementation includes the subgrade excavation, compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul > 0.5 mile.
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material haul > 0.5 mile.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from waste storage impoundments.
Scenario Feature Measure	Volume of Liner Material (including volume of soil cover, as needed)
Scenario Unit	Cubic Yard
Scenario Typical Size	2420 Typical liner 18" thick over 1 acre = 2420 CY

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$19,281.64	\$7.97
Labor	\$3,415.84	\$1.41
Mobilization	\$1,213.22	\$0.50
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$23,910.70	\$9.88

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	1204	Tractor, agricultural, 260 HP	Agricultural tractor with horsepower range of 240 to 290. Equipment and power unit costs. Labor not included.	Hour	\$107.76	24	\$2,586.24
Equipment/Installation	1203	Tractor, agricultural, 160 HP	Agricultural tractor with horsepower range of 140 to 190. Equipment and power unit costs. Labor not included.	Hour	\$69.24	24	\$1,661.76
Equipment/Installation	1207	Scraper, pull, 15 CY	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	\$17.89	24	\$429.36
Equipment/Installation	928	Dozer, 200 HP	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$128.97	24	\$3,095.28
Equipment/Installation	1619	Front End Loader, 185 HP	Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included.	Hour	\$69.73	24	\$1,673.52
Equipment/Installation	1615	Hauling, bulk, highway truck	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	\$0.23	12100	\$2,783.00
Equipment/Installation	1328	Roller, static, towed, tamping foot	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	\$11.52	24	\$276.48
Equipment/Installation	1223	Excavation, common earth, large equipment, 150 ft	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$2.80	2420	\$6,776.00
Labor	235	Specialist Labor	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	\$73.63	16	\$1,178.08
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.31	96	\$2,237.76
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$238.15	4	\$952.60
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.10	8	\$184.80
Mobilization	1146	Mobilization, Specialist Labor	Mobilization of Specialist Labor. Includes Agronomists, Foresters, Biologists, etc.	Hour	\$75.82	1	\$75.82

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	521D - Pond Sealing or Lining, Compacted Clay Treatment
Scenario ID	3
Scenario Name	Subgrade Excavation and Material Haul < 0.5 Mile
Scenario Description	Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from waste storage impoundment structures. Practice implementation includes the subgrade excavation, compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul < 0.5 mile.
Before Practice Situation	In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material haul < 0.5 mile.
After Practice Situation	Water conservation and environmental protection provided by limiting seepage losses from waste storage impoundments.
Scenario Feature Measure	Volume of Liner Material (including volume of soil cover, as needed)
Scenario Unit	Cubic Yard
Scenario Typical Size	2420 Typical liner 18" thick over 1 acre = 2420 CY

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$14,825.12	\$6.13
Labor	\$2,856.40	\$1.18
Mobilization	\$928.87	\$0.38
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$18,610.39	\$7.69

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	1204	Tractor, agricultural, 260 HP	Agricultural tractor with horsepower range of 240 to 290. Equipment and power unit costs. Labor not included.	Hour	\$107.76	24	\$2,586.24
Equipment/Installation	1203	Tractor, agricultural, 160 HP	Agricultural tractor with horsepower range of 140 to 190. Equipment and power unit costs. Labor not included.	Hour	\$69.24	24	\$1,661.76
Equipment/Installation	1207	Scraper, pull, 15 CY	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	\$17.89	24	\$429.36
Equipment/Installation	928	Dozer, 200 HP	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$128.97	24	\$3,095.28
Equipment/Installation	1328	Roller, static, towed, tamping foot	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	\$11.52	24	\$276.48
Equipment/Installation	1223	Excavation, common earth, large equipment, 150 ft	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$2.80	2420	\$6,776.00
Labor	235	Specialist Labor	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	\$73.63	16	\$1,178.08
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.31	72	\$1,678.32
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$238.15	3	\$714.45
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.10	6	\$138.60
Mobilization	1146	Mobilization, Specialist Labor	Mobilization of Specialist Labor. Includes Agronomists, Foresters, Biologists, etc.	Hour	\$75.82	1	\$75.82