Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	375 - Dust Control from Animal Activity on Open Lot Surfaces
Scenario ID	1
Scenario Name	Manure Harvesting - One Additional per Year
Scenario Description	Removal of loose, dry layer of manure from a confined animal operation once per year in addition to a regular annual manure clean-out to reduce emissions of particulate matter. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".
Before Practice Situation	The confined animal operation conducts a manure clean-out once per year. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.
After Practice Situation	In addition to the annual manure clean-out, an additional manure harvesting removes the dry, loose manure layer from the pens and working alleys. This manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture.
Scenario Feature Measure	Pen Surface Area, Including Working Alleys
Scenario Unit	Acre
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$191.61	$191.61
Labor	$90.05	$90.05
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$281.66	$281.66

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1327	Front End Loader, 95 HP	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hour	$38.10	2.25	$85.73
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	2.25	$105.89
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$20.01	4.5	$90.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	375 - Dust Control from Animal Activity on Open Lot Surfaces
Scenario ID	2
Scenario Name	Manure Harvesting - Two additional per Year
Scenario Description	Removal of loose, dry layer of manure from a confined animal operation twice per year in addition to a regular annual manure clean-out to reduce emissions of particulate matter. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".
Before Practice Situation	The confined animal operation conducts a manure clean-out once per year. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.
After Practice Situation	In addition to the annual manure clean-out, two additional manure harvesting efforts remove the dry, loose manure layer from the pens and working alleys. Each manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture.
Scenario Feature Measure	Pen Surface Area, Including Working Alleys
Scenario Unit	Acre
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$383.22	$383.22
Labor	$180.09	$180.09
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$563.31	$563.31

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1327	Front End Loader, 95 HP	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hour	$38.10	4.5	$171.45
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	4.5	$211.77
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$20.01	9	$180.09

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	375 - Dust Control from Animal Activity on Open Lot Surfaces
Scenario ID	3
Scenario Name	Solid-Set Sprinkler System, Less than 20 Acres
Scenario Description	Installation of a solid-set dust control sprinkler system on a confined animal operation with a pen and working alley area of less than 20 acres. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".
Before Practice Situation	The confined beef feedlot does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.
After Practice Situation	A solid-set dust control sprinkler system is installed to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/alley from animal manure and urine. The system is designed to avoid excessive overlap and over-application of water. This scenario has a typical pen/alley area of 15 acres. Associated practices include 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 442 - Irrigation System, Sprinkler, 516 - Pipeline, and 533 - Pumping Plant.
Scenario Feature Measure	Pen Surface Area, Including Working Alleys
Scenario Unit	Acre
Scenario Typical Size	15

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$169,301.55	$11,286.77
Labor	$0.00	$0.00
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$169,301.55	$11,286.77

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1344	Dust Control, Open Lot Solid Set Sprinkler System, w/Appurtenances, < 20 Acres	Solid set sprinkler system for dust control on open lot livestock pens, less than 20 acres, w/appurtenances and including complete labor and installation.	Acre	$11,286.77	15	$169,301.55

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	375 - Dust Control from Animal Activity on Open Lot Surfaces
Scenario ID	4
Scenario Name	Solid-Set Sprinkler System, 20-60 Acres
Scenario Description	Installation of a solid-set dust control sprinkler system on a confined animal operation with a pen and working alley area of 20-60 acres. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".
Before Practice Situation	The confined beef feedlot does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.
After Practice Situation	A solid-set dust control sprinkler system is installed to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/alley from animal manure and urine. The system is designed to avoid excessive overlap and over-application of water. This scenario has a typical pen/alley area of 35 acres. Associated practices include 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 442 - Irrigation System, Sprinkler, 516 - Pipeline, and 533 - Pumping Plant.
Scenario Feature Measure	Pen Surface Area, Including Working Alleys
Scenario Unit	Acre
Scenario Typical Size	35

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$314,599.25	$8,988.55
Labor	$0.00	$0.00
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$314,599.25	$8,988.55

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1345	Dust Control, Open Lot Solid Set Sprinkler System, w/Appurtenances, 20 to 60 Acres	Solid set sprinkler system for dust control on open lot livestock pens, 20-60 acres, w/appurtenances and including complete labor and installation	Acre	$8,988.55	35	$314,599.25

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	375 - Dust Control from Animal Activity on Open Lot Surfaces
Scenario ID	5
Scenario Name	Solid-Set Sprinkler System, Greater than 60 Acres
Scenario Description	Installation of a solid-set dust control sprinkler system on a confined animal operation with a pen and working alley area of greater than 60 acres. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".
Before Practice Situation	The confined beef feedlot does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.
After Practice Situation	A solid-set dust control sprinkler system is installed to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/alley from animal manure and urine. The system is designed to avoid excessive overlap and over-application of water. This scenario has a typical pen/alley area of 100 acres. Associated practices include 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 442 - Irrigation System, Sprinkler, 516 - Pipeline, and 533 - Pumping Plant.
Scenario Feature Measure	Pen Surface Area, Including Working Alleys
Scenario Unit	Acre
Scenario Typical Size	100

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$572,972.00	$5,729.72
Labor	$0.00	$0.00
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$572,972.00	$5,729.72

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1346	Dust Control, Open Lot Solid Set Sprinkler System, w/Appurtenances, > 60 Acres	Solid set sprinkler system for dust control on open lot livestock pens, greater than 60 acres, w/appurtenances and including complete labor and installation	Acre	$5,729.72	100	$572,972.00

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	375 - Dust Control from Animal Activity on Open Lot Surfaces
Scenario ID	6
Scenario Name	Solid-Set Sprinkler System Labor
Scenario Description	Labor for the active management of an installed solid-set sprinkler system for dust control at a confined animal operation to improve the system performance. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".
Before Practice Situation	A solid-set dust control sprinkler system is installed. However, the confined animal operation is not actively managing the sprinkler system to optimize performance.
After Practice Situation	In subsequent years following the installation of a solid-set dust control sprinkler system, the confined animal operation provides appropriate labor to actively manage the sprinkler system, thereby improving the reliability and effectiveness of the system.
Scenario Feature Measure	Pen Surface Area, Including Working Alleys
Scenario Unit	Acre
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$0.00	$0.00
Labor	$53.60	$53.60
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$53.60	$53.60

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.88	2	$35.76
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.	Hour	$35.68	0.5	$17.84

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	378 - Pond
Scenario ID	1
Scenario Name	Excavated or Embankment Pond without Pipe
Scenario Description	A low-hazard water impoundment structure on agricultural lands to improve water quality and/or to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. For an excavated pond the structure is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment, and an earthen spillway is constructed as needed. For an embankment pond, an earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.
Before Practice Situation	Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.
After Practice Situation	The typical embankment pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 2500 cubic yards to create an embankment for an embankment pond or, in the case of an excavated pit pond, excavating 2500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. In the case of an embankment pond, the product of the storage times the effective height of the dam is less than 3,000 and the effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principal spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.
Scenario Feature Measure	Embankment or Excavated Volume
Scenario Unit	Cubic Yard
Scenario Typical Size	2500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$3,784.90	$1.51
Labor	$972.03	$0.39
Mobilization	$422.95	$0.17
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$5,179.87	$2.07

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	40	Clearing and Grubbing	Clearing and Grubbing, includes materials, equipment and labor	Acre	$248.32	1	$248.32
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$84.81	41.7	$3,536.58
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	41.7	$972.03
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	1	$238.15
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

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	378 - Pond
Scenario ID	2
Scenario Name	Embankment Pond with Principal Spillway Barrel Conduit Less Than or Equal to a 16" Dia.
Scenario Description	A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway barrel conduit less than or equal to 16" in diameter and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Pipes in this size range are usually installed without a riser.
Before Practice Situation	Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.
After Practice Situation	The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 2500 cubic yards to create an embankment. The typical principal spillway pipe is 85' long and 12" in diameter with 3 - 5'x5' anti-seep collars. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.
Scenario Feature Measure	Volume of Embankment
Scenario Unit	Cubic Yard
Scenario Typical Size	3000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$1,649.22	$0.55
Equipment/Installation	$4,564.32	$1.52
Labor	$1,451.58	$0.48
Mobilization	$712.51	$0.24
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$8,377.63	$2.79

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.84	0.3	$7.15
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	7	$160.58
Materials	1322	Pipe, CMP, 18-16 gauge, weight priced	18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$1.18	850	$1,003.00
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.12	225.7	$478.48
Equipment/Installation	40	Clearing and Grubbing	Clearing and Grubbing, includes materials, equipment and labor	Acre	$248.32	1	$248.32
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$37.75	2	$75.50
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$84.81	50	$4,240.50
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	50	$1,165.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.88	16	$286.08
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	1	$238.15
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	12	$277.20
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.46	4	$69.84
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

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	378 - Pond
Scenario ID	3
Scenario Name	Embankment Pond with Principal Spillway Barrel Conduit Greater Than 16 Inches and Less Than or Equal to 24 Inches Dia.
Scenario Description	A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway barrel conduit greater than 16 inches and less than or equal to 24 inches in diameter and earthen auxiliary spillway, as designed.. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Pipes in this size range may be installed with a riser.
Before Practice Situation	Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.
After Practice Situation	The typical small low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3000 cubic yards to create an embankment. The typical principal spillway pipe is 90' long and 24" in diameter with 3 - 6'x6' anti-seep collars. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.
Scenario Feature Measure	Volume of Embankment
Scenario Unit	Cubic Yard
Scenario Typical Size	3000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$2,966.66	$0.99
Equipment/Installation	$4,688.48	$1.56
Labor	$1,523.10	$0.51
Mobilization	$758.71	$0.25
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$9,936.95	$3.31

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.84	0.3	$7.15
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	14.5	$332.63
Materials	1322	Pipe, CMP, 18-16 gauge, weight priced	18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$1.18	1710	$2,017.80
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.12	287.3	$609.08
Equipment/Installation	40	Clearing and Grubbing	Clearing and Grubbing, includes materials, equipment and labor	Acre	$248.32	1.5	$372.48
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$37.75	2	$75.50
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$84.81	50	$4,240.50
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	50	$1,165.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.88	20	$357.60
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	1	$238.15
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	14	$323.40
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.46	4	$69.84
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

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	378 - Pond
Scenario ID	4
Scenario Name	Embankment Pond with Principal Spillway Barrel Conduit Greater Than 24 Inches and Less Than or Equal to 30 Inches Dia.
Scenario Description	A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway barrel conduit greater than 24 inches and less than or equal to 30 inches in diameter and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Pipes in this size range may be installed with a riser.
Before Practice Situation	Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.
After Practice Situation	The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3000 cubic yards to create an embankment. The typical principal spillway pipe is 90' long and 30" in diameter with 3 - 6.5'x6.5' anti-seep collars. The typical riser is 4.5' long and 60" in diameter. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.
Scenario Feature Measure	Volume of Embankment
Scenario Unit	Cubic Yard
Scenario Typical Size	3000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$3,623.32	$1.21
Equipment/Installation	$5,277.14	$1.76
Labor	$1,701.90	$0.57
Mobilization	$828.55	$0.28
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$11,430.91	$3.81

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.84	0.3	$7.15
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	19.6	$449.62
Materials	1322	Pipe, CMP, 18-16 gauge, weight priced	18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$1.18	2160	$2,548.80
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.12	159	$337.08
Materials	1589	Pipe, CMP, 14-12 gauge, weight priced	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.77	364.5	$280.67
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$196.22	3	$588.66
Equipment/Installation	40	Clearing and Grubbing	Clearing and Grubbing, includes materials, equipment and labor	Acre	$248.32	1.5	$372.48
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$37.75	2	$75.50
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$84.81	50	$4,240.50
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	50	$1,165.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.88	30	$536.40
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	1	$238.15
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	14	$323.40
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.46	8	$139.68

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

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	378 - Pond
Scenario ID	5
Scenario Name	Embankment Pond with Principal Spillway Barrel Conduit Greater Than 30 Inches and Less Than or Equal to 48 Inches Dia.
Scenario Description	A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway barrel conduit greater than 30 inches and less than or equal to 48 inches in diameter and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Pipes in this size range are typically installed with a riser.
Before Practice Situation	Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.
After Practice Situation	The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 4000 cubic yards to create an embankment. The typical principal spillway pipe is 100' long and 42" in diameter with 3 - 7.5'x7.5' anti-seep collars. The typical riser is 5.5' long and 84" in diameter. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.
Scenario Feature Measure	Volume of Embankment
Scenario Unit	Cubic Yard
Scenario Typical Size	3000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$6,313.86	$2.10
Equipment/Installation	$6,186.18	$2.06
Labor	$1,809.18	$0.60
Mobilization	$920.95	$0.31
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$15,230.17	$5.08

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.84	0.3	$7.15
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	33.3	$763.90
Materials	1322	Pipe, CMP, 18-16 gauge, weight priced	18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$1.18	3900	$4,602.00
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.12	256	$542.72
Materials	1589	Pipe, CMP, 14-12 gauge, weight priced	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.77	517	$398.09
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$196.22	7	$1,373.54
Equipment/Installation	40	Clearing and Grubbing	Clearing and Grubbing, includes materials, equipment and labor	Acre	$248.32	2	$496.64
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$37.75	2	$75.50
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$84.81	50	$4,240.50
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	50	$1,165.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.88	36	$643.68
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	1	$238.15
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	18	$415.80
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.46	8	$139.68

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

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	378 - Pond
Scenario ID	6
Scenario Name	Embankment Pond with Principal Spillway Barrel Conduit Greater Than 48 Inches and Less Than or Equal to 60 Inches Dia.
Scenario Description	A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway barrel conduit greater than 48 inches and less than or equal to 60 inches in diameter and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Pipes in this size range are typically installed with a riser.
Before Practice Situation	Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.
After Practice Situation	The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 4500 cubic yards to create an embankment. The typical principal spillway pipe is 110' long and 54" diameter with 3 - 8.5'x8.5' anti-seep collars. The typical riser is 6.5' long 84" diameter. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.
Scenario Feature Measure	Volume of Embankment
Scenario Unit	Cubic Yard
Scenario Typical Size	3000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$7,844.52	$2.61
Equipment/Installation	$7,605.39	$2.54
Labor	$1,880.70	$0.63
Mobilization	$967.15	$0.32
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$18,297.76	$6.10

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.84	0.43	$10.25
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	53.3	$1,222.70
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.12	292	$619.04
Materials	1589	Pipe, CMP, 14-12 gauge, weight priced	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.77	7782.5	$5,992.53
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$196.22	13.6	$2,668.59
Equipment/Installation	40	Clearing and Grubbing	Clearing and Grubbing, includes materials, equipment and labor	Acre	$248.32	2.5	$620.80
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$37.75	2	$75.50
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$84.81	50	$4,240.50
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	50	$1,165.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.88	40	$715.20
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	1	$238.15
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	20	$462.00
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.46	8	$139.68
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