Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Water Management Engineering
Practice Code/Name	443 - Irrigation System, Surface and Subsurface
Scenario ID	2
Scenario Name	Aluminum Gated Pipe
Scenario Description	Installation of surface Aluminum gated pipe to efficiently convey and distribute irrigation water in irrigation furrows, borders, or contour levees. A typical scenario would include 1,320 feet of 10-inch Aluminum gated pipe, with 40 inch gate spacing used to irrigate 60 acres. Appurtenances include: gates, couplings, fittings, in-line valves, pressure relief valves, and air vent valves. Does not include flow meters, or a permanent inlet structure with or without filtration. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.,
Before Practice Situation	Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.
After Practice Situation	The installation will improve distribution uniformity, irrigation efficiency, and eliminate or reduce ditch seepage.
Scenario Feature Measure	Weight of Pipe
Scenario Unit	Pound
Scenario Typical Size	2,442

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$10,287.38	$4.21
Equipment/Installation	$0.00	$0.00
Labor	$178.80	$0.07
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$10,466.18	$4.29

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1382	Pipe, aluminum, smooth wall, weight priced	Aluminum manufactured into smooth wall pipe	Pound	$3.83	2686	$10,287.38
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	10	$178.80

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Water Management Engineering
Practice Code/Name	443 - Irrigation System, Surface and Subsurface
Scenario ID	4
Scenario Name	Poly Irrigation Tubing
Scenario Description	This practice includes installation of thin wall Polyethylene (PE) irrigation tubing with 2½-inch gates, or gated pipe installed in shallow above ground trenches to replace above ground canals used to deliver water to individual basins within a contour levee or basin surface irrigation system. The typical scenario will use 1,320 feet of 15-inch, 10 mil, PE irrigation tubing (a 1,320-foot roll weighs 250 pounds) with 100 2½-inch gates spaced approximately 13 feet apart, installed in shallow above ground trenches to replace above ground canals used to deliver water to individual basins within a 40-acre irrigated field. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590-Nutrient Management.
Before Practice Situation	Typical before situation would include a contour levee or basin surface irrigation system. Irrigation water is delivered to individual basins in a 40-acre rice field split into paddies using irrigation canals and field ditches.
After Practice Situation	After implementation irrigation efficiency is improved, while reducing irrigation application volume, runoff, evaporation losses, and cold water damage to crops. Reduced energy use and air quality improvements can also result.
Scenario Feature Measure	Weight of Pipe
Scenario Unit	Pound
Scenario Typical Size	250

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$525.00	$2.10
Equipment/Installation	$0.00	$0.00
Labor	$178.80	$0.72
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$703.80	$2.82

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1385	Pipe, PE, collapsible, weight priced	Polyethylene (PE) compound manufactured into collapsible tubing	Pound	$1.40	250	$350.00
Materials	1424	"Flap gate, plastic, 2½""""	"2 1/2"" plastic flap gate for poly irrigation tubing. Materials only."	Each	$1.75	100	$175.00
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	10	$178.80

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Water Management Engineering
Practice Code/Name	443 - Irrigation System, Surface and Subsurface
Scenario ID	3
Scenario Name	Polyvinyl Chloride (PVC) Gated Pipe
Scenario Description	Installation of surface PVC gated pipe to efficiently convey and distribute irrigation water in irrigation furrows, borders, or contour levees. A typical scenario would include 1,320 feet of 10-inch PVC gated pipe, with 40 inch gate spacing used to irrigate 60 acres. Appurtenances include: gates, couplings, fittings, in-line valves, pressure relief valves, and air vent valves. Does not include flow meters, or a permanent inlet structure with or without filtration. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.,
Before Practice Situation	Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.
After Practice Situation	The installation will improve distribution uniformity, irrigation efficiency, and eliminate or reduce ditch seepage.
Scenario Feature Measure	Weight of Pipe
Scenario Unit	Pound
Scenario Typical Size	3,320

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$5,368.44	$1.62
Equipment/Installation	$0.00	$0.00
Labor	$178.80	$0.05
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$5,547.24	$1.67

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1323	"Pipe, PVC, dia. < 18"", weight priced"	"Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18"". Materials only."	Pound	$1.47	3652	$5,368.44
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	10	$178.80

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Water Management Engineering
Practice Code/Name	443 - Irrigation System, Surface and Subsurface
Scenario ID	1
Scenario Name	Surge Valve & Controller
Scenario Description	This scenario would typically include installation and utilization of a 10-inch surge valve with automated controller (including all appurtenances) and installation labor needed to convert from a conventional surface irrigated system to a surge irrigation system. Typical field size is 80 acres. The surge valve will be used with PVC Gated Pipe or PE Gated Tubing to convey and distribute irrigation water to alternating irrigation sets in a timed surge cycle that results in reduced a surging irrigation application. The surging action increases rate of advance along set length, reduces deep percolation at upper end of field, increases uniformity of application along row length, and on lower intake soils can significantly reduce runoff losses. The result is improved irrigation efficiency, reduced leaching and erosion losses, and conserved energy. This scenario does not include gated pipe or associated practices. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.
Before Practice Situation	Unacceptable irrigation application uniformity along existing surface irrigation system furrow or border length caused by excessive run length or soil infiltration rate when operated with continuous inflow on existing system. System is over irrigated in attempt to adequately irrigate low end of field.
After Practice Situation	A surge surface irrigation system is in place. After implementation, distribution uniformity and irrigation efficiency is improved, by reducing irrigation application volume and deep percolation losses. Runoff reductions, reduced energy use, and air quality improvements can also result.
Scenario Feature Measure	Number of Surge Valves
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$1,672.50	$1,672.50
Equipment/Installation	$0.00	$0.00
Labor	$35.76	$35.76
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$1,708.26	$1,708.26

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1477	Surge Valve And Controller	Surge Valve and Controller, with appurtenances. Material cost includes valve, controller, all appurtenances, and mobilization.	Each	$1,672.50	1	$1,672.50
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	2	$35.76

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Water Management Engineering
Practice Code/Name	449 - Irrigation Water Management
Scenario ID	1
Scenario Name	Basic IWM
Scenario Description	A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the Feel and Appearance method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.
Before Practice Situation	The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with a sprinkler irrigation system.
After Practice Situation	Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.
Scenario Feature Measure	Irrigated Area Managed
Scenario Unit	Acre
Scenario Typical Size	125

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$0.00	$0.00
Labor	$1,284.80	$10.28
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$1,284.80	$10.28

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	8	$143.04
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	32	$1,141.76

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Agricultural Engineering
Practice Code/Name	462 - Precision Land Forming
Scenario ID	1
Scenario Name	Precision Land Forming, CY
Scenario Description	The site contains site specific topographic problem. Site conditions require attention to elevation and grade. Resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)
Before Practice Situation	The site, commonly a crop field or CAFO, has localized topographic issues causing drainage or erosion problems. Typical situation is an 80 acre field requiring more than 100 cy/ac of earthwork due to areas of excess and/or insufficient water.
After Practice Situation	Reshaping the surface of land to the required elevations and planned grades, 80 acre field, dry land row crop to more effectively utilize precipitation. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted separately as needed.
Scenario Feature Measure	Cubic yards of material placed
Scenario Unit	Cubic Yard
Scenario Typical Size	8,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$15,040.00	$1.88
Labor	$0.00	$0.00
Mobilization	$127.32	$0.02
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$15,167.32	$1.90

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.88	8000	$15,040.00
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	Water Management Engineering
Practice Code/Name	464 - Irrigation Land Leveling
Scenario ID	1
Scenario Name	Irrigation Land Leveling
Scenario Description	This scenario will level a typical 80 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using Dirt Pans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.
Before Practice Situation	Irregular field surface reduces uniformity of applied surface water and thus irrigation efficiency characterized by localized ponding and/or excess runoff/runon.
After Practice Situation	Cropland will be reshaped and leveled to provide uniform distribution of applied irrigation water in order to improve irrigation efficiency.
Scenario Feature Measure	Volume of Earth Moved
Scenario Unit	Cubic Yard
Scenario Typical Size	20,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$37,600.00	$1.88
Labor	$0.00	$0.00
Mobilization	$173.80	$0.01
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$37,773.80	$1.89

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.88	20000	$37,600.00
Mobilization	1138	Mobilization, small equipment	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$86.90	2	$173.80

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Agricultural Engineering
Practice Code/Name	466 - Land Smoothing
Scenario ID	1
Scenario Name	Minor Shaping
Scenario Description	Removing irregularities on the land surface of cropland by use of heavy equipment. Less than 100 CY/AC is required to be moved. The typical scenario is an 80 acre cropland field requiring 75 CY/AC material to be moved.
Before Practice Situation	Field damaged by flooding, past agricultural practices, or other topographic issues causing drainage or field workablity issues.
After Practice Situation	Topographic issues are repaired to improve drainage and/or workability.
Scenario Feature Measure	Acres of land treated
Scenario Unit	Acre
Scenario Typical Size	80

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$9,327.36	$116.59
Labor	$2,625.60	$32.82
Mobilization	$178.38	$2.23
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$12,131.34	$151.64

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$84.81	96	$8,141.76
Equipment/Installation	1206	Scraper, pull, 7 CY	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hour	$12.35	96	$1,185.60
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.	Hours	$27.35	96	$2,625.60
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	$25.53	2	$51.06
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	Agricultural Engineering
Practice Code/Name	466 - Land Smoothing
Scenario ID	2
Scenario Name	Terrace Removal
Scenario Description	Remove and dispose of an existing terrace system by placing earthfill, excavation, grading, leveling or other means required for removal. Dispose of terrace ridge earthfill material by placing it into the adjacent terrace channel, so that the disturbed area slope matches the adjacent field slope, and it does not impede subsequent work or cause onsite or offsite damage. Removing an existing terrace system will address the resource concerns of localized topographic issues causing drainage or erosion problems.
Before Practice Situation	On any land where an existing terrace system interfere with planned land use development or infrastructure. The site, commonly a crop field that is being devloped into a pasture/range field, has localized topographic issues causing drainage or erosion problems.
After Practice Situation	The typical length will be a 12,460 linear feet of terraces. The removal of an existing terrace system will be performed by placing earthfill, excavation, grading, leveling or other means required for removal with the use of heavy equipment. Dispose of terrace ridge earthfill material by placing it into the adjacent terrace channel, so that the disturbed area slope matches the adjacent field slope, and it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect the disturbed areas from erosion as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice will improve localized topographic issues causing drainage or erosion problems. It will also improve site conditions in order to apply conservation practices or facilitate better use of the landscape.
Scenario Feature Measure	Length of Removed Terraces
Scenario Unit	Linear Foot
Scenario Typical Size	12,460

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$5,158.80	$0.41
Labor	$1,094.00	$0.09
Mobilization	$263.68	$0.02
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$6,516.48	$0.52

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	928	Dozer, 200 HP	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$128.97	40	$5,158.80
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.	Hours	$27.35	40	$1,094.00
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	$25.53	1	$25.53
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

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	1
Scenario Name	Turf Reinforced Matting Lined Waterway
Scenario Description	Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.
After Practice Situation	TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).
Scenario Feature Measure	Square Foot of Waterway
Scenario Unit	Square Foot
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$5,087.85	$1.13
Equipment/Installation	$169.20	$0.04
Labor	$72.12	$0.02
Mobilization	$127.32	$0.03
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$5,456.49	$1.21

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1212	Turf reinforcement mat	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.51	535	$5,087.85
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.88	90	$169.20
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
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	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	2
Scenario Name	Rock Lined - 12 in Lined Waterway
Scenario Description	Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.
After Practice Situation	Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).
Scenario Feature Measure	Square Foot of Waterway
Scenario Unit	Square Foot
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$11,596.85	$2.58
Equipment/Installation	$554.60	$0.12
Labor	$112.18	$0.02
Mobilization	$127.32	$0.03
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$12,390.95	$2.75

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	44	Rock Riprap, Placed with geotextile	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$56.57	205	$11,596.85
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.88	295	$554.60
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	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.	Hours	$20.03	2	$40.06
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	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	3
Scenario Name	Rock Lined - 24in Lined Waterway
Scenario Description	Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.
After Practice Situation	Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).
Scenario Feature Measure	Square Foot of Waterway
Scenario Unit	Square Foot
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$26,305.05	$5.85
Equipment/Installation	$1,043.40	$0.23
Labor	$112.18	$0.02
Mobilization	$127.32	$0.03
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$27,587.95	$6.13

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	44	Rock Riprap, Placed with geotextile	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$56.57	465	$26,305.05
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.88	555	$1,043.40
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	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.	Hours	$20.03	2	$40.06
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	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	4
Scenario Name	Concrete Lined Waterway
Scenario Description	Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6" of clean sand or gravel subgrade, and 5" reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.
After Practice Situation	Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6" of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).
Scenario Feature Measure	Square Foot of Waterway
Scenario Unit	Square Foot
Scenario Typical Size	4500

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$2,622.40	$0.58
Equipment/Installation	$8,380.80	$1.86
Labor	$112.18	$0.02
Mobilization	$127.32	$0.03
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$11,242.70	$2.50

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded, Washed	Gravel, includes materials, equipment and labor to transport and place	Cubic yard	$23.84	110	$2,622.40
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	$98.18	80	$7,854.40
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.88	280	$526.40
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	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.	Hours	$20.03	2	$40.06
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	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	5
Scenario Name	Gabion Mattress Outlet
Scenario Description	Install an open weir gabion mattress lined outlet to control soil erosion and/or provide a stable outlet for other conservation practices. Minor excavation and/or earhfill is required to install the structure. The typical structure consists of 8 - 6'x9'x9"gabion mattresses, 8 - 6'x12'x9" gabion mattresses, 28 cubic yards of rock, 10.7 cubic yards of filter material, and 112 square yards of geotextile.
Before Practice Situation	Excessive sedimentation and soil erosion is occuring as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a stable vegetated outlet.
After Practice Situation	An open weir gabion mattress lined outlet is installed. Minor excavation and/or earhfill is required to install the structure. The typical structure consists of 8 - 6'x9'x9"gabion mattresses, 8 - 6'x12'x9" gabion mattresses, 28 cubic yards of rock, 10.7 cubic yards of bedding material, and 112 square yards of geotextile. Earthwork, bedding material, and rock is installed using a backhoe and laborers. Gabion mattresses are assembled by laborers. Geotextile is installed by laborers. Associated practices are Grassed Waterway (412), Diversion (362), and Critical Area Seeding (342).
Scenario Feature Measure	Volume of Rock
Scenario Unit	Cubic Yard
Scenario Typical Size	28

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$5,486.22	$195.94
Equipment/Installation	$3,627.25	$129.54
Labor	$4,823.20	$172.26
Mobilization	$296.36	$10.58
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$14,233.03	$508.32

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1210	Geotextile, non-woven, heavy weight	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials only.	Square Yard	$4.04	112	$452.48
Materials	1378	Gabion basket or mat	Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric.	Cubic Yard	$171.01	28	$4,788.28
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	10.7	$245.46
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.47	175	$607.25
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.	Hours	$37.75	80	$3,020.00
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	80	$1,618.40
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.	Hours	$20.03	160	$3,204.80
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$127.32	2	$254.64
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.86	2	$41.72

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Agricultural Engineering
Practice Code/Name	468 - Lined Waterway or Outlet
Scenario ID	6
Scenario Name	Concrete Lined Outlet
Scenario Description	Install an open weir concrete lined outlet to control soil erosion and/or provide a stable outlet for other conservation practices. Minor excavation and/or earhfill is required to install the structure for foundation and support embankments. The typical structure is 30 ft long and requires 12.8 cy of concrete. The concrete is reinforced with welded wire fabric. Cost include earthwork, 6" of clean sand or gravel subgrade, and 5" reinforced concrete slab.
Before Practice Situation	Excessive sedimentation and soil erosion is occuring as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a stable vegetated outlet.
After Practice Situation	An open weir concrete lined outlet is installed. Minor excavation and/or earhfill is required to install the structure for foundation and support embankments. The typical structure is 30 ft long and requires 12.8 cy of concrete. 21 cubic yards of subgrade bedding material. Earthwork and bedding material are installed using a dozer and laborers. Concrete is placed, graded and screeded by laborers. Associated practices are Grassed Waterway (412), Diversion (362), Waste Storage Facility (313), Waste Treatment Lagoon (359), and Critical Area Seeding (342).
Scenario Feature Measure	Volume of Concrete
Scenario Unit	Cubic Yard
Scenario Typical Size	12.8

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$481.74	$37.64
Equipment/Installation	$4,325.50	$337.93
Labor	$112.18	$8.76
Mobilization	$127.32	$9.95
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$5,046.74	$394.28

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$22.94	21	$481.74
Equipment/Installation	38	Concrete, CIP, formed reinforced	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$202.07	12.8	$2,586.50
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$4.64	300	$1,392.00
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.47	100	$347.00
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	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.	Hours	$20.03	2	$40.06
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