

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #1 - Data Collect Surface Year 1-QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$20,748.56

Scenario Cost/Unit: \$20,748.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Labor</i>						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	130	\$4,027.40
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	100	\$7,243.00
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$101.31	16	\$1,620.96

Labor

CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$87.86	20	\$1,757.20
----------------------------------	------	---	------	---------	----	------------

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	4	\$100.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #2 - Data Collect Surface Year 1 - NO QAPP

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface systems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$14,473.20

Scenario Cost/Unit: \$14,473.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	60	\$4,345.80
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	130	\$4,027.40
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	4	\$100.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #3 - Data Collect Surface Year 2+

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface systems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$14,473.20

Scenario Cost/Unit: \$14,473.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	60	\$4,345.80
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	130	\$4,027.40
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	4	\$100.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #4 - Data Collect Surface Last Year

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected to complete monitoring period.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$17,370.40

Scenario Cost/Unit: \$17,370.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	130	\$4,027.40
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	100	\$7,243.00
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	4	\$100.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	40	\$1,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	20	\$500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #5 - Data Collect Tile Year 1-QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$40,759.82

Scenario Cost/Unit: \$40,759.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Labor</i>						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$87.86	20	\$1,757.20
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	312	\$9,665.76
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	130	\$9,415.90

Labor

CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$101.31	16	\$1,620.96
---------------------------------	------	--	------	----------	----	------------

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	12	\$300.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #6 - Data Collect Tile Year 1 - NO QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$34,484.46

Scenario Cost/Unit: \$34,484.46

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	90	\$6,518.70
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	312	\$9,665.76
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	12	\$300.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #7 - Data Collect Tile Year 2+

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$34,484.46

Scenario Cost/Unit: \$34,484.46

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	312	\$9,665.76
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	90	\$6,518.70
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	12	\$300.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #8 - Data Collect Tile Last Year

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$37,381.66

Scenario Cost/Unit: \$37,381.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	130	\$9,415.90
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	312	\$9,665.76
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	12	\$300.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	120	\$3,000.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #9 - Data Collect Surface Year 1-QAPP with two treatment Sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$28,466.02

Scenario Cost/Unit: \$28,466.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Labor</i>						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$101.31	24	\$2,431.44
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$87.86	30	\$2,635.80
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	130	\$9,415.90

Labor

CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	156	\$4,832.88
--------------------	------	--	------	---------	-----	------------

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	6	\$150.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #10 - Data Collect Surface Year 1 less QAPP (pre-install information) with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$20,501.58

Scenario Cost/Unit: \$20,501.58

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	90	\$6,518.70
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	156	\$4,832.88
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	6	\$150.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #11 - Data Collect Surface Year 2+ with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$20,501.58

Scenario Cost/Unit: \$20,501.58

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	156	\$4,832.88
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	90	\$6,518.70
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	6	\$150.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #12 - Data Collect Surface Last Year with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$24,847.38

Scenario Cost/Unit: \$24,847.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	150	\$10,864.50
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	156	\$4,832.88
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	30	\$750.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	6	\$150.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	60	\$1,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #13 - Data Collect Tile Year 1 with two treatment sites and QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site monitoring stations, preparation of monitoring plan and a quality assurance project plan (QAPP) to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have not been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$56,469.21

Scenario Cost/Unit: \$56,469.21

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Labor</i>						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	364	\$11,276.72
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	175	\$12,675.25
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$101.31	24	\$2,431.44

Labor

CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$87.86	30	\$2,635.80
----------------------------------	------	---	------	---------	----	------------

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	18	\$450.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #14 - Data Collect Tile Year 1 less QAPP (pre-install information) with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$48,504.77

Scenario Cost/Unit: \$48,504.77

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	135	\$9,778.05
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	364	\$11,276.72
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	18	\$450.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #15 - Data Collect Tile Year 2+ with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$48,504.77

Scenario Cost/Unit: \$48,504.77

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	135	\$9,778.05
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	364	\$11,276.72
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	18	\$450.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00

Materials

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #16 - Data Collect Tile Last Year with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$52,850.57

Scenario Cost/Unit: \$52,850.57

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	195	\$14,123.85
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	364	\$11,276.72
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	90	\$2,250.00

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.00	18	\$450.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.00	180	\$4,500.00

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #2 - System Installation-Surface Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$18,788.13

Scenario Cost/Unit: \$18,788.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	5	\$362.15
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	60	\$1,858.80
Materials						
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	\$2,131.67	1	\$2,131.67
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28

Materials

Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.12	\$930.71
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	\$2,000.00	1	\$2,000.00
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	\$8.56	1	\$8.56
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	\$739.03	1	\$739.03
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitoring	Each	\$3,167.02	1	\$3,167.02
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	1	\$2,274.94
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	\$1,237.25	1	\$1,237.25
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	1	\$2,684.24

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #4 - System Installation-Tile Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$27,154.70

Scenario Cost/Unit: \$27,154.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	100	\$3,098.00
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	6	\$434.58
Materials						
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	\$739.03	2	\$1,478.06
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitoring	Each	\$3,167.02	1	\$3,167.02
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	\$8.56	1	\$8.56
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	\$1,237.25	1	\$1,237.25

Materials

Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	1	\$2,274.94
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	\$2,131.67	2	\$4,263.34
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	2	\$5,368.48
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	\$2,000.00	1	\$2,000.00
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.12	\$930.71
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48
Pre-calibrated flow control structure-subsurface (pipe flow)	2615	Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure.	Each	\$1,500.00	1	\$1,500.00

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #6 - System Installation-Above&Below cold climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will differ on the subsurface flow by allowing a smaller pre-calibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$31,103.27

Scenario Cost/Unit: \$31,103.27

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	6	\$434.58
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	60	\$1,858.80
Materials						
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	\$1,237.25	2	\$2,474.50
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.12	\$930.71

Materials

Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	\$8.56	2	\$17.12
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	\$2,131.67	2	\$4,263.34
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	\$2,000.00	1	\$2,000.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	2	\$4,549.88
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitoring	Each	\$3,167.02	2	\$6,334.04
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	2	\$5,368.48
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	\$739.03	2	\$1,478.06

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #7 - System Installation-Retrofit 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and back-up/solar power supply be added to existing system. It is actually to represent a cost for any system updates that has component costs of \$2,400 or less as per the component costs in various scenarios.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$3,182.30

Scenario Cost/Unit: \$3,182.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	5	\$362.15
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	16	\$495.68
Materials						
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48

Materials

Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.12	\$930.71
-------------------------------------	------	--	----------	------------	------	----------

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #8 - System Installation-Retrofit 2

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, and depth (stage) sensor to be added to existing system. It is actually to represent a cost for any system updates that has component costs greater than \$2,400 but less than or equal to \$7,300 as per the component costs in various scenarios.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$8,265.40

Scenario Cost/Unit: \$8,265.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	20	\$619.60
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	5	\$362.15
Materials						
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.12	\$930.71

Materials

Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	1	\$2,684.24
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	1	\$2,274.94
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #9 - System Installation-Retrofit 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, pre-calibrated flow control structure, and depth (stage) sensor to be added to existing system. It is actually to represent a cost for any system updates that has component costs greater than \$7,300 but less than or equal to \$10,500 as per the component costs in various scenarios. Anything above \$10,500 will be evaluated as a full system replacement as per scenarios for surface or tile (subsurface) drainage.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$11,804.18

Scenario Cost/Unit: \$11,804.18

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	32	\$991.36
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	5	\$362.15
Materials						
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitoring	Each	\$3,167.02	1	\$3,167.02
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	1	\$2,274.94
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	1	\$2,684.24

Materials

Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.12	\$930.71
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #10 - System Installation-Retrofit Above and Below 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and two back-up/solar power supply be added to existing paired system. It is actually to represent a cost for any system updates that has component costs of \$3,300 or less as per the component costs in various scenarios.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$4,608.69

Scenario Cost/Unit: \$4,608.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	32	\$991.36
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	5	\$362.15
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.24	\$1,861.42

Materials

Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
--------------------------------	------	---	------	----------	---	----------

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #11 - System Installation-Retrofit Above 2

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, and two depth (stage) sensors to be added to existing paired system. It is actually to represent a cost for any system updates that has component costs greater than \$3,300 but less than or equal to \$13,200 as per the component costs in various scenarios.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$14,599.48

Scenario Cost/Unit: \$14,599.48

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	6	\$434.58
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	32	\$991.36
Materials						
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.24	\$1,861.42

Materials

Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	2	\$4,549.88
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	2	\$5,368.48

Practice: 202 - Edge-of-Field Water Quality Monitoring– System Installation

Scenario: #12 - System Installation-Retrofit Above 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, two pre-calibrated flumes, and two depth (stage) sensors to be added to existing paired system. It is actually to represent a cost for any system updates that has component costs greater than \$13,500 but less than or equal to \$19,500 as per the component costs in various scenarios. Anything above a \$19,500 will be evaluated as a full system replacement as per scenarios for surface or tile (subsurface) drainage.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$21,181.36

Scenario Cost/Unit: \$21,181.36

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$72.43	6	\$434.58
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.98	40	\$1,239.20
Materials						
Weather Station, precipitation	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	\$961.28	1	\$961.28

Materials

Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	\$432.48	1	\$432.48
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	\$2,274.94	2	\$4,549.88
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitoring	Each	\$3,167.02	2	\$6,334.04
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitoring	Each	\$2,684.24	2	\$5,368.48
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	\$7,755.90	0.24	\$1,861.42

Practice: 309 - Agrichemical Handling Facility

Scenario: #2 - Liquid Agrichemical Storage, Treated Timber Walls

Scenario Description:

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area

Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roofs and Covers (367).

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in fabricated containment that is 24' x 36' x3' with flexible membrane lined walls. The walls are made of treated timber. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Scenario Feature Measure: Square Feet of storage area

Scenario Unit: Square Foot

Scenario Typical Size: 864

Scenario Cost: \$7,001.88

Scenario Cost/Unit: \$8.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$42.05	24	\$1,009.20
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	12	\$785.88
Labor						
General Labor	231	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	\$20.81	42	\$874.02
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	24	\$572.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	12	\$355.68
Materials						
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	\$1.60	816	\$1,305.60
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.83	1088	\$903.04
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	11	\$314.93
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	16	\$464.16
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 309 - Agrichemical Handling Facility

Scenario: #3 - Concrete Agrichemical Handling Pad for mixing and loading

Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices:

Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Roofs and Covers (367), Pond Sealing or Lining, Flexible Membrane (521a).

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant with no storage for spills. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 16' x 40' x 6" with an application equipment length of 36 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Scenario Feature Measure: Square Feet of handling area

Scenario Unit: Square Foot

Scenario Typical Size: 640

Scenario Cost: \$3,397.35

Scenario Cost/Unit: \$5.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-place 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	\$128.74	12	\$1,544.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	4	\$261.96
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	4	\$95.44
General Labor	231	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	\$20.81	4	\$83.24
Materials						
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	\$1.00	640	\$640.00
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	10	\$286.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 309 - Agrichemical Handling Facility

Scenario: #5 - Liquid Agrichemical Storage, Concrete Walls and 12 inch Floor

Scenario Description:

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated

practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roofs and Covers (367)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical storage and handling facility is constructed with a 12" concrete floor and 1' concrete perimeter walls. The 12" slab thickness is required to meet local regulations. Design is based on MWPS 37. The average size of the agrichemical handling facility for storage is 35' x 40'. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Scenario Feature Measure: Square Feet of storage area

Scenario Unit: Square Foot

Scenario Typical Size: 1,400

Scenario Cost: \$12,243.43

Scenario Cost/Unit: \$8.75

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	39	\$5,020.86
Concrete, CIP, formed reinforced	38	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	\$406.76	10	\$4,067.60
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	6	\$392.94
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	6	\$177.84
Materials						
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	\$1.00	1400	\$1,400.00
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	22	\$629.86
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	2	\$137.60
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 309 - Agrichemical Handling Facility

Scenario: #6 - Liquid Agrichemical Storage, Double walled tank

Scenario Description:

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated

practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roofs and Covers (367)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals. Self contained 3200 gallon double walled tank that provides secondary containment meeting NRCS Conservation Practice Standard 309 and local requirements for secondary containment.

Tank is set on a 12'x12'x6" gravel pad. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$8,529.99

Scenario Cost/Unit: \$8,529.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.38	16	\$38.08
Materials						
Tank, Double wall	2387	Liquid agrichemical double walled tank, 3,200 gal storage.	Each	\$8,237.30	1	\$8,237.30
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	3	\$87.03
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 309 - Agrichemical Handling Facility

Scenario: #7 - Liquid Agrichemical Storage, Lined earthen basin

Scenario Description:

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals along with a mixing and loading pad. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area

Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roofs and Covers (367)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical storage and handling facility is constructed as a lined earthen basin. The average size of the agrichemical handling facility for storage is 40' x 40' (bottom dimensions). Typical depth is 30", and earthwork balances cut/fill. Following earthwork, 4" of sand or #8 bank run gravel is placed on the bottom as a liner base and sloped to a collection sump. When this scenario is used, the complete installation also includes a synthetic liner under code 521A. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Scenario Feature Measure: Square Feet of storage area

Scenario Unit: Square Foot

Scenario Typical Size: 1,600

Scenario Cost: \$2,106.46

Scenario Cost/Unit: \$1.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	12	\$785.88
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	12	\$355.68
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	25	\$715.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 313 - Waste Storage Facility

Scenario: #1 - Earthen Storage Facility

Scenario Description:

An earthen waste impoundment constructed with cuts and fills balanced such that one half of the impoundment depth is excavated and the remainder of the storage is created with the embankment. The structure is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Payment includes materials and equipment necessary for construction of the storage structure. If a roof is to be included in the installation, refer to Practice Standard 367 - Roofs and Covers. If an earthen storage liner is to be included in the installation, refer to associated Practice Standards 521A, 521B, 521C, or 521D. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Adequately protect liner at agitation and access points.

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design size: total storage volume 147,000 ft³; 150'X150' (top); 3:1 inside and outside side slopes; embankment topwidth = 10'; compaction ratio = 1.1; total depth = 10'; embankment volume = 10,430 cu yd

Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629) .

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 147,000

Scenario Cost: \$29,548.18

Scenario Cost/Unit: \$0.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	4110	\$17,220.90
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	980	\$813.40
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	3130	\$10,986.30
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	\$3.66	8	\$29.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 313 - Waste Storage Facility

Scenario: #8 - Dry Stack Facility, Concrete Floor with Wood Side Walls

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete Floor with pressure treated wood side walls. Payment includes materials and equipment necessary for construction of the floor and walls. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. The purpose of this practice is to temporarily, properly store manure and other agricultural by-products that are stackable until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical is 40' x 56' concrete slab with 5' high walls. The facility floor is 5" reinforced concrete with 5' pressure treated wood (2" x 8" boards) walls, 6" x 6" x 8' posts set 4' c-c with 6" concrete curbing. Walls allow for greater storage volume. Walls consist of three perimeter walls (40' + 56' + 40') for a total wall length of 136 linear feet. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Scenario Feature Measure: Cubic Foot Storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 11,200

Scenario Cost: \$12,718.74

Scenario Cost/Unit: \$1.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	9	\$73.35
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	83	\$347.77
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$128.74	4.5	\$579.33
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	35	\$4,505.90
Concrete, CIP, formed reinforced	38	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	\$406.76	2	\$813.52
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	83	\$186.75
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$42.05	9	\$378.45

Labor

Labor

General Labor	231	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	\$20.81	90	\$1,872.90
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	9	\$214.74

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	28	\$812.28
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.83	1315	\$1,091.45
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	\$1.60	840	\$1,344.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #9 - Dry Stack Facility, Concrete Floor with Concrete Side Walls

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor and concrete side walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Payment includes materials and equipment necessary for construction of the floor and walls. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). The purpose of this practice is to properly store manure and other agricultural by-products that are stackable until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical is 40' x 56' concrete slab with 5' high walls. The facility floor is 5" reinforced concrete with 5' reinforced concrete walls. Walls allow for greater storage volume. Walls consist of three perimeter walls (40' + 56' + 40') for a total wall length of 136 linear feet. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Note on use of concrete walls versus wood walls: different states utilize different options depending on many specific conditions which may change what is considered least cost. Each state will decide individually based on the suite of scenarios developed which meets their program policy and resource goals and needs

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Scenario Feature Measure: Cubic Foot Storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 11,200

Scenario Cost: \$18,553.80

Scenario Cost/Unit: \$1.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	83	\$347.77
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	35	\$4,505.90
Concrete, CIP, formed reinforced	38	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	\$406.76	30	\$12,202.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	83	\$186.75
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	28	\$812.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 313 - Waste Storage Facility

Scenario: #10 - ConcreteLid Tank, <1,000 Cu Ft Storage

Scenario Description:

This scenario consists of installing a small concrete tank with a solid lid and a total storage volume of less than 1,000 Cu Ft. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete lid tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank typically 5' deep x 8' wide x 9' long, with a total storage volume of 360 cubic feet. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533), and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 360

Scenario Cost: \$4,993.30

Scenario Cost/Unit: \$13.87

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	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	\$406.76	6	\$2,440.56
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	60	\$330.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	10	\$1,111.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	10	\$296.40
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	40	\$200.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	4	\$116.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 313 - Waste Storage Facility

Scenario: #11 - Concrete Lid Tank, ≥1,000 Cu Ft Storage

Scenario Description:

This scenario consists of installing a small concrete tank with a solid lid and a total storage volume of greater than or equal to 1,000 Cu Ft. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete lid tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank typically 8' deep x 12' wide x 40' long, with a total storage volume of 3,840 cubic feet. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533),and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 3,840

Scenario Cost: \$20,195.04

Scenario Cost/Unit: \$5.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	100	\$551.00
Concrete, CIP, formed reinforced	38	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	\$406.76	35	\$14,236.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	20	\$2,222.80
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	10	\$1,287.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators ≥50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers ≥12", Dump Trucks, Ag Equipment ≥150 HP, Scrapers, Water Wagons.	Hour	\$29.64	20	\$592.80
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	80	\$400.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	14	\$406.14

Mobilization

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #12 - Concrete Tank Open Top, <5,000 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank with or without a full width ramp that has a total storage volume less than 5,000 Cu Ft. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank typically 5' deep, with a bottom area of 880 sq ft, and a total storage volume of 4,400 cu ft. Sizing based on volume of manure, other wastes, rainfall, lot runoff, etc. as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 4,400

Scenario Cost: \$17,785.10

Scenario Cost/Unit: \$4.04

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	30	\$3,334.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	200	\$1,102.00
Concrete, CIP, formed reinforced	38	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	\$406.76	15.2	\$6,182.75
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	25.7	\$3,308.62
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	30	\$889.20
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	186.5	\$932.50
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	53	\$1,537.53

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #13 - Concrete Tank Open Top, 5,000 - 14,999 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank that has a total storage volume from 5,000 to 14,999 Cu Ft. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank typically 8' deep, with a bottom area of 1256 SF, and a total storage volume of 10,048 cubic feet. Sizing based on volume of manure, other wastes, rainfall, lot runoff, etc. as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 10,048

Scenario Cost: \$21,805.26

Scenario Cost/Unit: \$2.17

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	30	\$3,334.20
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	20	\$2,574.80
Concrete, CIP, formed reinforced	38	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	\$406.76	28	\$11,389.28
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	200	\$1,102.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	30	\$889.20
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	125	\$625.00

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	48	\$1,392.48
---------------------------	----	--	------------	---------	----	------------

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #14 - Concrete Tank Open Top, 15,000 - 24,999 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank that has a total storage volume from 15,000 to 24,999 Cu Ft. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank is typically 8 ft deep, with a bottom area of 2,670 sq.ft., and a total storage volume of 21,360 cubic feet. Size based on volume of manure, other wastes, rainfall, lot runoff, etc as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533) and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 21,360

Scenario Cost: \$32,375.80

Scenario Cost/Unit: \$1.52

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	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	\$406.76	37	\$15,050.12
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	240	\$1,322.40
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	45	\$5,793.30
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	46	\$5,112.44
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	46	\$1,363.44
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	183	\$915.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	80	\$2,320.80

Mobilization

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #15 - Concrete Tank Open Top, 25,000 - 49,999 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank that has a total storage volume from 25,000 to 49,999 Cu Ft. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank installed is 8' deep, with an interior bottom area of 3,786 SF, and a total storage volume of 30,288 cubic feet. Outside dimensions, 4,225 sq ft (includes 3' footing and 8" wall). Size based on manure, other wastes, rainfall, lot runoff, etc as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 30,288

Scenario Cost: \$43,324.26

Scenario Cost/Unit: \$1.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	80	\$10,299.20
Concrete, CIP, formed reinforced	38	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	\$406.76	50	\$20,338.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	400	\$2,204.00
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	1450	\$5,089.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	126	\$3,655.26
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	248	\$1,240.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 313 - Waste Storage Facility

Scenario: #16 - Concrete Tank Open Top, 50,000 - 74,999 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank that has a total storage volume from 50,000 to 74,999 Cu Ft. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank typically 8' deep, with a bottom area of 8470 SF, and a total storage volume of 67,760 cubic feet. Outside dimensions 9,216 sq ft (includes 3' footing and 8" wall). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Scenario Feature Measure: total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 67,760

Scenario Cost: \$74,358.14

Scenario Cost/Unit: \$1.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	3000	\$10,530.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	600	\$3,306.00
Concrete, CIP, formed reinforced	38	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	\$406.76	75	\$30,507.00
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	160	\$20,598.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	244	\$7,078.44
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	368	\$1,840.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 313 - Waste Storage Facility

Scenario: #17 - Concrete Tank Open Top, 75,000 - 109,999 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank that has a total storage volume from 75,000 to 109,999 Cu Ft. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Tank typically 8' deep, with a bottom area of 12,642 SF, and a storage capacity of 101,136 cubic feet. Outside dimensions 13,456 sq ft (includes 3' footing and 8" wall). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 101,136

Scenario Cost: \$98,418.14

Scenario Cost/Unit: \$0.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	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	\$406.76	90	\$36,608.40
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	230	\$29,610.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	900	\$4,959.00
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	4300	\$15,093.00
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	450	\$2,250.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	324	\$9,399.24
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #18 - Concrete Tank Open Top, ≥110,000 Cu Ft Storage

Scenario Description:

This scenario consists of installing an open top concrete tank that has a total storage volume of 110,000 Cu Ft or greater. Payment includes materials and equipment necessary for construction of the concrete tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Tank can also be installed under an animal facility using slats. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Payment includes all materials, equipment and labor to install a concrete tank and gravel for drainfill around the tank.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.
 Tank typically 8' deep with a bottom area of 21,000 SF and a total storage volume of 168,000 CF. Outside dimensions 22,200 sq ft (includes 3' footing and 8" wall). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 168,000

Scenario Cost: \$146,844.00

Scenario Cost/Unit: \$0.87

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	370	\$47,633.80
Concrete, CIP, formed reinforced	38	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	\$406.76	116	\$47,184.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	1660	\$9,146.60
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	7000	\$24,570.00
Materials						
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$5.00	580	\$2,900.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	514	\$14,911.14

Mobilization

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 313 - Waste Storage Facility

Scenario: #19 - Composted Bedded Pack - Gravel Floor

Scenario Description:

A composted bedded pack facility is constructed to store wastes as part of an agricultural waste management system. Payment includes materials and equipment necessary for construction of the floor and walls. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design: floor area 4,000 ft², (40' X 100'); 4' concrete wall height, 3' footing depth with a geotextile and 6" gravel layer over an earthen floor; 20' openings on each end of structure.

Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Obstruction Removal (500), and Roofs and Covers (367).

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000

Scenario Cost: \$24,177.86

Scenario Cost/Unit: \$6.04

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	22	\$121.22
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	15	\$1,931.10
Concrete, CIP, formed reinforced	38	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	\$406.76	42	\$17,083.92
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.38	444	\$1,056.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	74	\$310.06
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	102	\$84.66
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	74	\$259.74
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	22	\$49.50

Materials

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	74	\$2,146.74
---------------------------	----	--	------------	---------	----	------------

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	4	\$996.60
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	2	\$137.60

Practice: 313 - Waste Storage Facility

Scenario: #20 - Composted Bedded Pack, 6 inch Reinforced Concrete Floor

Scenario Description:

A composted bedded pack facility is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario is intended for situations where consistency of manure or geological conditions prohibit the use of earthen floors. Payment includes materials and equipment necessary for construction of the floor and walls. The walls may be constructed of concrete or wood as allowed by state policies and regulations. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design: floor area 4,000 ft², (40' X 100'); 4' concrete wall height, 3' footing depth with a 6" reinforced concrete floor; 20' openings on each end of structure. Note on 6" floor versus 5" floor option, 6" floor is the minimum requirement for Ohio.

Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Obstruction Removal (500) and Roofs and Covers (367).

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000

Scenario Cost: \$28,838.44

Scenario Cost/Unit: \$7.21

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	22	\$49.50
Concrete, CIP, formed reinforced	38	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	\$406.76	42	\$17,083.92
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	74	\$9,526.76
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	22	\$121.22
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	37	\$155.03
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	102	\$84.66
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	74	\$259.74
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	37	\$1,059.31

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
--------------------------------	------	---	------	----------	---	----------

Practice: 314 - Brush Management

Scenario: #1 - Light Brush Management

Scenario Description:

Light brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where less than 10% canopy cover across the treatment area is in undesirable non-herbaceous cover, and the treatment area is less than 18% slope on average. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Amur cork tree, Siberian elm, callery pear, autumn olive, multiflora rose, barberry, burning bush, honeysuckle, or periwinkle that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed & forage, and potential animal health issues.

After Situation:

Undesirable non-herbaceous species are controlled with a pass with a brush hog over the treatment area followed by spot chemical treatment. The treatment area is mechanically treated early in the growing season to reduce above ground biomass. The treated plants will readily resprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$1,153.13

Scenario Cost/Unit: \$46.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	8	\$442.72
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	6	\$296.94
Labor						
General Labor	231	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	\$20.81	8	\$166.48
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	2.5	\$105.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 314 - Brush Management

Scenario: #2 - Medium Brush Management

Scenario Description:

Medium brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where 10% - 39% canopy cover across the treatment area is in undesirable non-herbaceous cover, and the treatment area is less than 18% slope on average. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Amur cork tree, Siberian elm, callery pear, autumn olive, multiflora rose, barberry, burning bush, honeysuckle, or periwinkle that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed & forage, and potential animal health issues.

After Situation:

Undesirable non-herbaceous species are controlled with a pass with a brush hog over the treatment area followed by spot chemical treatment. The treatment area is mechanically treated early in the growing season to reduce above ground biomass. The treated plants will readily resprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$1,897.11

Scenario Cost/Unit: \$75.88

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	10	\$553.40
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	12	\$593.88
Labor						
General Labor	231	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	\$20.81	14	\$291.34
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	7.5	\$317.25
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 314 - Brush Management

Scenario: #3 - High Brush Management

Scenario Description:

High brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where 40%-60% canopy cover across the treatment area is in undesirable non-herbaceous cover, or the treatment area is on land with 18% - 25% slopes on average regardless of percent cover of undesirable species. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Tree of heaven, Paulownia (princess tree), honeysuckle, Japanese knotweed, privet, or wintercreeper, that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed & forage, and potential animal health issues.

After Situation:

Undesirable non-herbaceous species are controlled with a combination of manual chainsawing, pass with a brush hog over the treatment area, and spot chemical treatment. The treatment area is mechanically treated early in the growing season to reduce above ground biomass. The treated plants will readily resprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$4,495.39

Scenario Cost/Unit: \$179.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	24	\$1,328.16
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.13	8	\$49.04
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	20	\$989.80
Labor						
General Labor	231	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	\$20.81	65	\$1,352.65
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	15	\$634.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 314 - Brush Management

Scenario: #4 - Very High Brush Management

Scenario Description:

High brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where greater than 60% canopy cover across the treatment area is in undesirable non-herbaceous cover, or the treatment area is on land with greater than 25% slopes on average regardless of percent cover of undesirable species. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Tree of heaven, Paulownia (princess tree), honeysuckle, Japanese knotweed, privet, or wintercreeper, that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed & forage, and potential animal health issues.

After Situation:

Undesirable non-herbaceous species are controlled with a combination of manual chainsawing, pass with a brush hog over the treatment area, and spot chemical treatment. The treatment area is mechanically treated early in the growing season to reduce above ground biomass. The treated plants will readily resprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$7,345.82

Scenario Cost/Unit: \$293.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	40	\$2,213.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.13	20	\$122.60
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	40	\$1,979.60
Labor						
General Labor	231	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	\$20.81	88	\$1,831.28
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	25	\$1,057.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 314 - Brush Management

Scenario: #5 - Multiple year of treatment

Scenario Description:

Multiple years of brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where greater than 60% canopy cover across the treatment area is in undesirable non-herbaceous cover, or the treatment area is on land with greater than 25% slopes on average regardless of percent cover of undesirable species. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Tree of heaven, Paulownia (princess tree), honeysuckle, Japanese knotweed, privet, or wintercreeper, that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed & forage, and potential animal health issues.

After Situation:

Undesirable non-herbaceous species are controlled with a combination of manual chainsawing, pass with a brush hog over the treatment area, and spot chemical treatment. This requires treatment over the course of two years. The treatment area is mechanically treated early in the first growing season to reduce above ground biomass. The treated plants will readily resprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied. A second treatment application will be applied the following growing season to capture any regrowth; this will consist of mowing and herbicide treatment. The second year treatment typically will be about 2/3 of the area treated in the first year.

Scenario Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$9,034.83

Scenario Cost/Unit: \$361.39

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	52	\$2,573.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	4	\$144.88
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.13	20	\$122.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	50	\$2,767.00
Labor						
General Labor	231	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	\$20.81	92	\$1,914.52
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	32.5	\$1,374.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	2	\$137.60

Practice: 314 - Brush Management

Scenario: #6 - Glade/Savanna Restoration

Scenario Description:

Removing or reducing woody plant canopy and utilizing chemical treatment (except for non-sprouting woody species) to promote herbaceous growth to restore and manage glades/savannas. Facilitating practices may include but not limited to: Early Successional Habitat Management/Development (647), Prescribed Burning (338), Restoration and Management of Rare and Declining Habitats (643), and Conservation Cover (327).

Before Situation:

The understory has a minimal amount of herbaceous and early woody successional vegetation. Wildlife food, cover, and shelter are lacking, and woody cover control is needed to manage for associated wildlife species that benefit from habitats such as glades/savannas.

After Situation:

The glade/savanna habitat is restored and flora and fauna that depend on the glade/savanna habitat flourish.

Scenario Feature Measure: area of opening

Scenario Unit: Acres

Scenario Typical Size: 2

Scenario Cost: \$654.39

Scenario Cost/Unit: \$327.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.13	18	\$110.34
Labor						
General Labor	231	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	\$20.81	21	\$437.01
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$19.12	2	\$38.24
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 315 - Herbaceous Weed Control

Scenario: #1 - Light Spot Treatment

Scenario Description:

Light spot treatment herbaceous weed control is used on non-cropland acres (including forestland, pasture, and idle areas) where less than 10% canopy coverage across the treatment area is in undesirable herbaceous cover, or a specific area spot treatment is needed such as creating open ground under a wildlife habitat structure. Payment is based on impacted acres only. The practice entails the treatment of weeds using small equipment (such as an ATV with sprayer) to apply chemicals, or using hand tools (such as axes, shovels, hoes, nippers) to remove or cut off herbaceous plants at or below the root collar. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Area consists of herbaceous weed species such as sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, etc. that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$731.33

Scenario Cost/Unit: \$29.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	8	\$442.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Labor						
General Labor	231	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	\$20.81	2	\$41.62
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	2.5	\$105.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 315 - Herbaceous Weed Control

Scenario: #2 - Medium Spot Treatments

Scenario Description:

Medium spot treatment herbaceous species management is used on non-cropland acres (including forestland, pasture, and idle areas) where greater than 10% canopy coverage across the treatment area is in undesirable herbaceous cover, and spot treatment is preferred over blanket treatment to maintain the persistence of desirable broadleaf and legumes within the treatment area. Payment is based on impacted acres only. The practice entails the treatment of weeds using small equipment (such as an ATV with sprayer) to apply chemicals, or using applicable mechanical methods such as hand tools (such as axes, shovels, hoes, nippers) to remove or cut off herbaceous plants at or below the root collar, and/or spot mowing. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Area consists of herbaceous weed species such as sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, etc. that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$2,060.92

Scenario Cost/Unit: \$82.44

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	24	\$1,328.16
Labor						
General Labor	231	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	\$20.81	2	\$41.62
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	13	\$549.90
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 315 - Herbaceous Weed Control

Scenario: #3 - Blanket Treatment One Pass

Scenario Description:

Blanket treatment one pass herbaceous weed control is used on non-cropland acres (including forestland, pasture, and idle areas) where a blanket treatment approach is acceptable and the non-desireable weeds can be controlled with one treatment. Payment is based on impacted acres only. The practice entails the treatment of weeds using a blanket chemical application or mechanical brush hog operation. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Area consists of herbaceous weed species such as sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, etc. that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$1,582.18

Scenario Cost/Unit: \$63.29

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	25	\$141.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	6	\$143.16
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	25	\$1,057.50
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 315 - Herbaceous Weed Control

Scenario: #4 - Blanket Treatment Multi Pass

Scenario Description:

Blanket treatment multi pass herbaceous weed control is used on non-cropland acres (including forestland, pasture, and idle areas) where a blanket treatment approach is acceptable and multiple passes or approaches are needed to control the non-desireable weeds. Payment is based on impacted acres only. The practice entails the treatment of weeds using multiple blanket chemical applications or multiple mechanical brush hog operations, or a combination of chemical and mechanical. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

Before Situation:

Area consists of herbaceous weed species such as sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, etc. that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$3,413.58

Scenario Cost/Unit: \$136.54

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	4	\$144.88
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	6	\$296.94
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	50	\$283.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	10	\$238.60
Materials						
Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	50	\$2,115.00
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 315 - Herbaceous Weed Control

Scenario: #5 - Tree & Shrub Post-planting Weed Control

Scenario Description:

Treatment takes place in areas where newly planted trees and/or shrubs are experiencing encroachment by grass and weed competition. Chemical treatment is needed to ensure the successful establishment of desirable woody species through the application of appropriate herbicides via directional spray to reduce residual effects on planted trees and/or shrubs. Mowing between rows during the growing season is needed to control residual weed growth. Areas to be treated tend to be small and isolated, resulting in high mobilization costs. Due to desirable species mixed with undesirable, caution is needed during treatment.

Before Situation:

Planted trees or shrubs are experiencing excessive grass and weed competition resulting in poor plant health, reduced growth, and some mortality.

After Situation:

Desirable vegetation is released from competing vegetation. All undesirable vegetation is removed within 2 feet of desired plants.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: \$656.77

Scenario Cost/Unit: \$131.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$49.49	1	\$49.49
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$29.86	2	\$59.72
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	2	\$110.68
Materials						
Herbicide, Sulfometuron-methyl	340	Used for the control of annual and perennial grasses and broad leaved weeds in non-crop land. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$38.78	5	\$193.90
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shi	Acre	\$1.32	5	\$6.60
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 315 - Herbaceous Weed Control

Scenario: #6 - Aquatic Areas Weed Control

Scenario Description:

Control of aquatic weed infestations, such as phragmites, reeds canary grass, or cattails, in wetland areas using multiple chemical applications. Due to moist soil conditions, herbicide is applied with an ATV and spot sprayer to avoid excessive disturbance to the site. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Payment is based on impacted acres only.

Before Situation:

Area consists of aquatic herbaceous weed species such as phragmites, reeds canary grass, cattails, etc. that exceed the desirable ecological site condition promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: \$1,389.85

Scenario Cost/Unit: \$277.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$55.34	22.5	\$1,245.15
Materials						
Herbicide, Glyphosate-ipa salt 4SL	346	Product is typically used for aquatic usage. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$5.06	15	\$75.90
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 316 - Animal Mortality Facility

Scenario: #4 - Static Pile, Earthen Pad

Scenario Description:

This scenario consists of installing an earthen pad. Area is sized for composting animal mortality as a static pile or windrow and equipment access to the material. Facility sizing parameters include primary and secondary composting area requirements to allow piles to be turned at least once to go into another heat cycle prior to final disposal, typically land application. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers.

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events.

Construct a 18'x32' earthen surface to process mortality. Site preparation includes topsoil removal, minimal regrading and compaction.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Subsurface Drain (606), Heavy Use Area Protection (561), and Underground Outlet (620).

Scenario Feature Measure: Pad Area

Scenario Unit: Square Foot

Scenario Typical Size: 576

Scenario Cost: \$390.83

Scenario Cost/Unit: \$0.68

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	22	\$49.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	22	\$92.18
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 316 - Animal Mortality Facility

Scenario: #5 - Static Pile, Concrete Pad

Scenario Description:

This scenario consists of installing a concrete pad. Area is sized for composting animal mortality as a static pile or windrow and equipment access to the material. Facility sizing parameters include primary and secondary composting area requirements to allow piles to be turned at least once to go into another heat cycle prior to final disposal, typically land application. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers.

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events.

Construct a 18' x 32' concrete surface to process mortality. Concrete 5" thick with light reinforcement. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand subbase and then concrete. Berm is 92' in length (around 3 sides of the pad), 2' tall, 4' topwidth with 2:1 sideslopes. Note regarding scenario for concrete versus just earthen pad: concrete pads are necessary in situations such as, but not limited to, a site with soils that are permeable, karst, frequently accessed, or have regulatory requirements that do not allow for an earthen surface.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Subsurface Drain (606), Heavy Use Area Protection (561), and Underground Outlet (620).

Scenario Feature Measure: Pad Area

Scenario Unit: Square Foot

Scenario Typical Size: 576

Scenario Cost: \$1,936.92

Scenario Cost/Unit: \$3.36

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	66	\$276.54
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	22	\$49.50
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	9	\$1,158.66
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	7	\$203.07
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 316 - Animal Mortality Facility

Scenario: #6 - Static Pile, Concrete Pad with Concrete Bin(s)

Scenario Description:

This scenario consists of installing concrete bin(s), open on one end, on top of a concrete pad to compost mortality in static piles that have sufficient bulking material to allow natural aeration. Facility sizing parameters include primary and secondary composting area requirements to allow piles to be turned at least once to go into another heat cycle prior to final disposal, typically land application. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Size of facility based on daily mortality and sizing procedures accepted in particular state.

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

This scenario is based upon a 40' x 14' concrete slab with 5' high bin dividers, and 4 10' x 14' bins. Preparation includes stripping the top 1' of soil and roll compact same back into sub-floor. The bins are constructed on a 5" concrete slab. Roofed portion is addressed under Roofs and Covers (367). Piles are turned by moving to adjacent bin to go through a second heat cycle prior to final land application. Note regarding scenario for concrete walls versus wood walls: the more sturdy concrete walls are necessary in situations where a producer is managing the composting with heavy equipment that would easily damage and compromise the integrity of wooden walls.

Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), Heavy Use Area Protection (561) and Underground Outlet (620).

Scenario Feature Measure: Cubic Foot of Storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 2,800

Scenario Cost: \$10,701.28

Scenario Cost/Unit: \$3.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	9	\$1,158.66
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	22	\$92.18
Concrete, CIP, formed reinforced	38	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	\$406.76	22	\$8,948.72
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	22	\$49.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	7	\$203.07
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 316 - Animal Mortality Facility

Scenario: #7 - Static Pile, Concrete Pad with Wood Bin(s)

Scenario Description:

This scenario consists of installing wooden bin(s), open on one end, on a concrete pad to compost mortality in static piles that have sufficient bulking material to allow natural aeration. Facility sizing parameters include primary and secondary composting area requirements to allow piles to be turned at least once to go into another heat cycle prior to final disposal, typically land application. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Size of facility based on daily mortality and sizing procedures accepted in particular state.

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

This scenario is based upon a 40' x 14' concrete slab with 5' high bin dividers, and 4 10' x 14' bins. Preparation includes stripping the top 1' of soil and roll compact same back into sub-floor.

Roofed portion is addressed under Roofs and Covers (367). Piles are turned by moving to adjacent bin to go through a second heat cycle prior to final land application.

Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), Heavy Use Area Protection (561) and Underground Outlet (620).

Scenario Feature Measure: Cubic Foot of Storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 2,800

Scenario Cost: \$5,474.72

Scenario Cost/Unit: \$1.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	22	\$49.50
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	9	\$1,158.66
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$128.74	3	\$386.22
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	22	\$92.18
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	6	\$48.90
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$42.05	6	\$252.30
Labor						
General Labor	231	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	\$20.81	48	\$998.88

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	6	\$143.16
----------------------------	-----	---	------	---------	---	----------

Materials

Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.83	1170	\$971.10
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	\$1.60	576	\$921.60
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	7	\$203.07

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
--------------------------------	------	---	------	----------	---	----------

Practice: 317 - Composting Facility

Scenario: #1 - Concrete Slab Under Wood Bin Dividers

Scenario Description:

A composting facility for manure and other agricultural organic by-products designed with a concrete slab under wooden bin dividers. Composter is installed to address water quality concerns and results in a composted product that can be used in multiple ways. Payment includes materials and equipment necessary for pad and bin construction. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Not to be used for animal mortality composting. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure, litter and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner. This scenario is based upon a 40' x 56' concrete slab with 5' high bin dividers, and 5 bins (configured 2 at 20'x28' and 3 at 20'x18.5'). Preparation includes stripping the top 1' of soil and roll compact same back into sub-floor. The bins are constructed on a 5" concrete slab used to store and stabilize manure, litter and other agricultural by-products.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Scenario Feature Measure: Cubic Foot of Storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 11,200

Scenario Cost: \$12,740.80

Scenario Cost/Unit: \$1.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	10	\$81.50
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$42.05	10	\$420.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	83	\$347.77
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	83	\$186.75
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	35	\$4,505.90
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$128.74	5	\$643.70
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	10	\$238.60

Labor

General Labor	231	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	\$20.81	90	\$1,872.90
---------------	-----	--	------	---------	----	------------

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	28	\$812.28
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	\$1.60	1032	\$1,651.20
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.83	2085	\$1,730.55

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
--------------------------------	------	---	------	----------	---	----------

Practice: 317 - Composting Facility

Scenario: #2 - Concrete Slab Under Concrete Bin Dividers

Scenario Description:

A composting facility for manure and other agricultural organic by-products designed with a concrete slab under concrete bin dividers. Composter is installed to address water quality concerns and results in a composted product that can be used in multiple ways. Payment includes materials and equipment necessary for pad and bin construction. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Not to be used for animal mortality composting. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure, litter and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner. This scenario is based upon a 40' x 56' concrete slab with 5' high bin dividers, and 5 bins (configured 2 at 20'x28' and 3 at 20'x18.5'). Preparation includes stripping the top 1' of soil and roll compact same back into sub-floor. The bins are constructed on a 5" concrete slab used to store and stabilize manure, litter and other agricultural by-products. Note regarding scenario for concrete walls versus wood walls: the more sturdy concrete walls are necessary in situations where a producer is managing the composting with heavy equipment that would easily damage and compromise the integrity of wooden walls.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Scenario Feature Measure: Cubic Foot of Storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 11,200

Scenario Cost: \$20,338.45

Scenario Cost/Unit: \$1.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	83	\$186.75
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	83	\$347.77
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	35	\$4,505.90
Concrete, CIP, formed reinforced	38	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	\$406.76	35	\$14,236.60
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	28	\$812.28
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
--------------------------------	------	---	------	----------	---	----------

Practice: 317 - Composting Facility

Scenario: #4 - Concrete Pad

Scenario Description:

A composting facility for manure and other agricultural organic by-products designed with a concrete pad. Composter is installed to address water quality concerns and results in a composted product that can be used in multiple ways. Payment includes materials and equipment necessary for pad construction. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Not to be used for animal mortality composting. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner.

This scenario consists of removing and compacting back into place the top 1' of soil to create a compacted, impervious earthen floor to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final disposal, typically land application. Construct a 75'x226' concrete surface 5" thick on an improved compacted earthen surface. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and reinstalling topsoil, compacted. Note regarding scenario for concrete versus just earthen pad: concrete pads are necessary in situations such as, but not limited to, a site with soils that are permeable, karst, frequently accessed or have regulatory requirements that do not allow for an earthen surface.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 16,950

Scenario Cost: \$42,434.96

Scenario Cost/Unit: \$2.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-place 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	\$128.74	260	\$33,472.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	315	\$1,319.85
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	630	\$1,417.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	206	\$5,976.06

Mobilization

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
--------------------------------	------	---	------	----------	---	----------

Practice: 317 - Composting Facility

Scenario: #6 - Compacted Gravel Pad, 8 inch compacted gravel

Scenario Description:

A composting facility for manure and other agricultural organic by-products designed with a 8" compacted gravel pad. Composter is installed to address water quality concerns and results in a composted product that can be used in multiple ways. Payment includes materials and equipment necessary for pad construction. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, but does not require a hard working surface such as concrete. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. Not to be used for animal mortality composting. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner.

This scenario consists of installing a gravel pad over impervious soil to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final disposal, typically land application. Construct a 75'x226' area on an improved gravel surface. Sub base material sufficiently compacted or improved. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and installing 8" of compacted gravel. Note regarding use of 8" gravel versus 6" gravel: Required to meet specific state standard.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 16,950

Scenario Cost: \$19,681.25

Scenario Cost/Unit: \$1.16

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	630	\$1,417.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	315	\$1,319.85
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.38	1883	\$4,481.54
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	421	\$12,213.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 327 - Conservation Cover

Scenario: #1 - Introduced Grass

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a row crop cropping system to permanent non-native vegetation (scenario includes non-native grass/legume species). The typical size of the practice is 10 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

Land covered with permanent non-native grass/legume vegetation has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$6,225.05

Scenario Cost/Unit: \$622.51

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	10	\$196.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	10	\$62.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	10	\$56.60
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	5	\$2,152.15
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	5	\$2,188.80
Materials						
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	400	\$200.00
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.79	500	\$395.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	500	\$320.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	10	\$156.30
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	10	\$496.50

Practice: 327 - Conservation Cover

Scenario: #2 - Native Grass

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a row crop cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 10 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

Land covered with permanent native grass vegetation has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$7,173.45

Scenario Cost/Unit: \$717.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	20	\$113.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	10	\$196.90
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	5	\$2,152.15
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	5	\$2,188.80
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	20	\$312.60
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	10	\$2,209.80

Practice: 327 - Conservation Cover

Scenario: #3 - Organic Introduced Mix

Scenario Description:

This practice applies on organically managed land needing permanent protective cover. This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a row crop cropping system to permanent non-native vegetation (scenario includes non-native grass/legume species). The typical size of the practice is 10 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

Before Situation:

Crops such as vegetables and small fruit crops are organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

Land covered with permanent non-native grass/legume vegetation has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$6,596.10

Scenario Cost/Unit: \$659.61

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	20	\$205.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	10	\$62.80
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	10	\$196.90
Foregone Income						
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	5	\$2,492.60
FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	5	\$2,522.20
Materials						
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.30	500	\$150.00
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.30	400	\$120.00
Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	10	\$696.20
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.30	500	\$150.00

Practice: 327 - Conservation Cover

Scenario: #4 - Organic Native Mix

Scenario Description:

This practice applies on organically managed land needing permanent protective cover. This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a row crop cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 10 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. *Certified Organic Native Seed is typically NOT available, therefore non-organic seed components were used.

Before Situation:

Crops such as vegetables and small fruit crops are organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

Land covered with permanent native grass vegetation has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$7,626.90

Scenario Cost/Unit: \$762.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	10	\$196.90
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	20	\$205.40
Foregone Income						
Fl, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	5	\$2,522.20
Fl, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	5	\$2,492.60
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	10	\$2,209.80

Practice: 327 - Conservation Cover

Scenario: #5 - Pollinator Habitat

Scenario Description:

Permanent vegetation, including mix of native grasses, legume, forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides a mix of early, mid, and late season forbs, as well as habitat for pollinators. Typical practice size is variable depending on site, this scenario uses 5 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

Land covered with permanent pollinator habitat including a mix of native grasses, legume, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: \$3,788.28

Scenario Cost/Unit: \$757.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	5	\$98.45
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	10	\$56.60
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	2.5	\$1,076.08
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	2.5	\$1,094.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	10	\$156.30
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	\$261.29	5	\$1,306.45

Practice: 327 - Conservation Cover

Scenario: #6 - Organic Pollinator Habitat

Scenario Description:

Permanent vegetation, including mix of native grasses, legume, forbs (mix may also include non-native species), established on organically managed land needing permanent vegetative cover that provides a mix of early, mid, and late season forbs, as well as habitat for pollinators. Typical practice size is variable depending on site, this scenario uses 5 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. *Certified Organic Native Seed is typically NOT available, therefore non-organic seed components were used.

Before Situation:

Crops such as vegetables and small fruit crops are organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

Organically managed land covered with permanent pollinator habitat including a mix of native grasses, legume, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: \$4,015.00

Scenario Cost/Unit: \$803.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	10	\$102.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	5	\$98.45
Foregone Income						
FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	2.5	\$1,261.10
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	2.5	\$1,246.30
Materials						
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	\$261.29	5	\$1,306.45

Practice: 327 - Conservation Cover

Scenario: #7 - Prairie Restoration

Scenario Description:

Permanent vegetation, including mix of native grasses, legume, forbs established on land needing permanent vegetative cover as a restoration to native prairie habitat. Typical practice size is variable depending on site, this scenario uses 10 ac as the typical size. In addition to restoring prairie cover, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

Land restored to natural habitat including a mix of native grasses, legume, forbs. This practice may also have reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$8,922.05

Scenario Cost/Unit: \$892.21

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	10	\$196.90
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	5	\$2,152.15
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	5	\$2,188.80
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	10	\$2,209.80
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	20	\$312.60
One Species, Native Forb, Low Cost	2329	Native forb. Includes material and shipping only.	Acre	\$186.18	10	\$1,861.80

Practice: 327 - Conservation Cover

Scenario: #8 - Sedge Meadow

Scenario Description:

Permanent herbaceous vegetation, including mix of native grasses, sedges and other wetland forbs, established on land needing permanent vegetative cover as a restoration to wetland habitat typical to the site. Typical practice size is variable depending on site, this scenario uses 1 ac as the typical size. In addition to restoring sedge meadow cover, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, riparian areas and other areas where wetland hydrology exist or will be restored.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

Land restored to natural wetland habitat including a mix of native grasses, sedges and forbs adapted to living in saturated soils with temperary inundation. This practice may also have reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$4,801.74

Scenario Cost/Unit: \$4,801.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	1	\$44.18
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	1	\$10.27
Foregone Income						
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Labor						
General Labor	231	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	\$20.81	28	\$582.68
Materials						
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	\$1.37	2723	\$3,730.51

Practice: 327 - Conservation Cover

Scenario: #9 - Aquatic Emergent

Scenario Description:

Aquatic and emergent herbacious vegetation established in a wetland that is seasonally inundated with water to restore the characteristic wetland plant community to the site. Typical practice size is variable depending on site, this scenario uses 1 ac as the typical size. In addition to restoring aquatic emergent plant community this practice scenario may also improve fish and wildlife habitat, soil quality, improve water quality, and improve air quality. Practice applicable on cropland, riparian areas, lacustrine fringes, depression areas and other areas where wetland hydrology exist or will be restored.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

Land restored to natural wetland habitat including a mix of native aquatic and/or emergent wetland plants adapted to living in saturated and inundated soils with seasonal inundation. Wetland fish and wildlife habitat has been benefited. This practice may also have reduced high nutrient levels in water in the wetland may have reduced other water pollutants. This scenario does not apply to critical area plantings.

Scenario Feature Measure: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$2,424.76

Scenario Cost/Unit: \$2,424.76

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Labor						
General Labor	231	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	\$20.81	16	\$332.96
Materials						
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	\$1.37	1210	\$1,657.70

Practice: 328 - Conservation Crop Rotation

Scenario: #1 - Add Small Grain to Rotation

Scenario Description:

Scenario is for incorporating a small grain crop into an existing cropping system that does not include small grains. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation utilizing small grain on a cropland farm, and foregone income that may be associated with the change from the current rotation. It requires new acres established in a rotation. Cost represents typical situations for conventional and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional high residue and smallgrain that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$8,144.91

Scenario Cost/Unit: \$81.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Foregone Income						
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	50	\$21,888.00
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	50	\$21,521.50
Fl, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$196.61	-33.3	(\$6,547.11)
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	-33.3	(\$14,577.41)
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	-33.3	(\$14,333.32)
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	5	\$193.25

Practice: 328 - Conservation Crop Rotation

Scenario: #2 - Add 2 Years of Perennials to Rotation

Scenario Description:

Scenario is for incorporating two years of a high residue perennial crop into an existing rotation that does not include perennials. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation utilizing perennials on a cropland farm, and foregone income that may be associated with the change from the current rotation. It requires new acres established in the rotation. Cost represents typical situations for conventional and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional 2 yrs of high residue perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$17,953.25

Scenario Cost/Unit: \$179.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Foregone Income						
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	50	\$21,888.00
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	50	\$21,521.50
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	-25	(\$10,944.00)
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	-25	(\$10,760.75)
Fl, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$41.38	-100	(\$4,138.00)
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	10	\$386.50

Practice: 328 - Conservation Crop Rotation

Scenario: #3 - Add 1 Year of Perennials to Rotation

Scenario Description:

Scenario is for incorporating one year of a high residue perennial crop into an existing rotation that does not include perennials. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation utilizing perennials on a cropland farm, and foregone income that may be associated with the change from the current rotation. It requires new acres established in the rotation. Cost represents typical situations for conventional and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional 1 yrs of high residue perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$7,155.34

Scenario Cost/Unit: \$71.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Foregone Income						
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	33.3	\$14,333.32
Fl, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$196.61	-25	(\$4,915.25)
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	-25	(\$10,760.75)
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	-25	(\$10,944.00)
Fl, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$196.61	33.3	\$6,547.11
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	33.3	\$14,577.41
Fl, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$41.38	-50	(\$2,069.00)
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	10	\$386.50

Practice: 328 - Conservation Crop Rotation

Scenario: #4 - Add 2 Years of Perennials to Rotation, Specialty Crop

Scenario Description:

Scenario is for incorporating two years of a high residue perennial crop into an existing rotation that does not include perennials. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation utilizing perennials on an organic specialty crop farm, and foregone income that may be associated with the change from the current rotation. It requires new acres established in the rotation. This practice includes foregone income by including perennials into the rotation. Cost represents typical situations for conventional and organic specialty crop producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional 2 yrs of high residue perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$6,780.18

Scenario Cost/Unit: \$678.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	\$1,093.36	-3.33	(\$3,640.89)
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	\$1,093.36	10	\$10,933.60
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$41.38	-13.32	(\$551.18)
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	1	\$38.65

Practice: 329 - Residue and Tillage Management - No-Till

Scenario: #1 - No-Till/Strip-Till (non-Organic or Organic)

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till (conservation tilled) system on cropland or organic cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to grow and harvest crops in systems. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. The no-till/strip-till system relies on mulching/residue management and/or chemicals for weed control (rather than cultivation). Organic no-till/strip-till alternatively uses organic-approved chemicals or alternative methods of weed control such as hand weeding, flaming, roller crimping, etc. (rather than cultivation). System is applicable in both irrigated and non-irrigated fields.

Before Situation:

Row crops or small grains (or organically grown crops) are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application (or, in the case of organically grown crops, cultivation and mulching) . Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Wind and/or water erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

After Situation:

329 is applied per the practice plan and all the appropriate criteria are followed for the planned purpose(s). Crop residue is managed on the surface of a crop field year round while limiting soil disturbing activities to those which condition residue, place nutrients, and plant crops. All crops are seeded/planted with a no-till drill, no-till/strip-till transplanter, or no-till/strip-till planter, which minimize soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect and provide wildlife food and cover. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$1,854.00

Scenario Cost/Unit: \$18.54

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	50	\$984.50
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acre	\$17.39	50	\$869.50

Practice: 338 - Prescribed Burning

Scenario: #1 - Grassland, > 10 acres

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area consisting of herbaceous and/or low volatile woody fuel. Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios.

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: \$1,215.53

Scenario Cost/Unit: \$30.39

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	1	\$44.18
Equipment/Installation						
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	\$2.51	4	\$10.04
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$29.86	4	\$119.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	4	\$144.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	16	\$499.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	8	\$309.20
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	\$3.99	5	\$19.95
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 338 - Prescribed Burning

Scenario: #2 - Grassland, Small acreage (≤10 acres)

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area consisting of herbaceous and/or low volatile woody fuel. Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios.

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$364.93

Scenario Cost/Unit: \$36.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	1	\$44.18
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	1	\$36.22
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	\$2.51	1	\$2.51
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$29.86	1	\$29.86
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	1	\$38.65
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	4	\$124.76
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	\$3.99	5	\$19.95
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 340 - Cover Crop

Scenario: #1 - Chemical or Mechanical Kill Species

Scenario Description:

A single species grass/legume/brassica or mixed grass/legume/brassica cover will be planted as a cover crop immediately after harvest of a row crop (within 30 days), and will be followed by a row crop that will utilize fixed nitrogen and cover crop biomass as a mulch. This scenario assumes that seed will be planted with a no-till drill. Legume seeds must be inoculated with the proper inoculant prior to planting. The cover crop should be allowed to generate as much biomass as possible (reach early to mid-bloom) before it is terminated, without delaying the planting of the following crop. Termination methods include using approved chemical and/or mechanical methods, in order to maximize nitrogen fixation. The legume will promote biological nitrogen fixation and reduce energy use by reducing the need for commercial nitrogen fertilizer in following crops.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage (in some cases). Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil. Only commercial nitrogen fertilizer is used for following crops.

After Situation:

Within 30 days after harvest of row crop, fields are planted with a single species grass or legume cover crop, such as annual ryegrass, clover or vetch species. The cover crop is seeded with a no-till drill. No fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. Wind erosion is reduced by standing residues. The cover crop is terminated chemically and/or mechanically prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect. By utilizing the nitrogen that is fixed by the legume cover crop, the amount of energy is reduced by reducing the amount of commercial fertilizer that will be needed for the following crop.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$8,027.00

Scenario Cost/Unit: \$80.27

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	100	\$1,969.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	100	\$566.00
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	100	\$3,929.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	100	\$1,563.00

Practice: 340 - Cover Crop

Scenario: #2 - Winter Kill Species

Scenario Description:

Typically a small grain or small grain-brassica mix (may also use forage sorghum, legumes, buckwheat, etc) will be planted as a cover crop immediately after harvest of a row crop (within 30 days), and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop species established under this scenario will winter kill, meaning no species termination is required.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage (in some cases). Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 30 days after harvest of row crop, fields are planted with a small grain-brassica mix cover crop, typically oats and oilseed radish. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is established using winter kill species which should not require termination in the spring. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing residues. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$5,898.00

Scenario Cost/Unit: \$58.98

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	100	\$1,969.00
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	100	\$3,929.00

Practice: 340 - Cover Crop

Scenario: #3 - 2 Species Mix

Scenario Description:

This scenario reflects the establishment of a diverse mix of cover crops consisting of two or more species which can include a combination of grasses, legumes, forbs, or other herbaceous plants. Cover crop will be planted immediately after harvest of a row crop (within 30 days), and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using approved chemical and/or mechanical methods prior to planting a subsequent crop.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage (in some cases). Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 30 days after harvest of row crop, fields are planted with a diverse mix of cover crop species. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. Wind erosion is reduced by standing residues. The cover crop is terminated with approved chemical and/or mechanical methods prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved at an accelerated pace due to the diversity in additional biomass and ground cover which provides increased soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$9,508.00

Scenario Cost/Unit: \$95.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	100	\$1969.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	100	\$566.00
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	\$54.10	100	\$5,410.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	100	\$1,563.00

Practice: 340 - Cover Crop

Scenario: #5 - Organic Cover Crop

Scenario Description:

Typically a small grain or small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc) will be planted as a cover crop immediately after harvest of an organically grown crop, and will be followed by an organically grown crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechanical kill method (mowing, rolling, undercutting, etc.), prior to planting the subsequent crop. This scenario **REQUIRES** use of Certified Organic Seed.

Before Situation:

Organically grown crops such as various vegetable and fruit crops (along with organically produced row crops) are grown and harvested in mid-late fall. Fields are disked immediately following harvest. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 30 days after harvest of organic crop, fields are planted with a small grain-legume mix cover crop, typically rye and clover. The average field size is 25 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated with using a mechanical kill method (mowing, rolling, undercutting, etc.), prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing residues. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: \$4,272.75

Scenario Cost/Unit: \$170.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	25	\$492.25
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	\$18.94	25	\$473.50
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	25	\$256.75
Materials						
Certified Organic, One Species, Cool Season, Annual Legume	2337	Certified organic cool season annual legume. Includes material and shipping only.	Acre	\$122.01	25	\$3,050.25

Practice: 342 - Critical Area Planting

Scenario: #1 - Grass or Grass/legume mix-normal tillage

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind erosion, sheet and rill erosion, or visible rills may have already occurred. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Apply 90 lbs of nitrogen, 90 lbs of phosphorus, and 90 lbs of potassium, along with an application of 2 tons of lime. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, drill the following mixture for a vegetative cover: Smooth Bromegrass (20 lbs/ac), Perennial Ryegrass (10 lbs/ac), and Red Clover (8 lbs/ac) with a nurse crop of oats at a seeding rate of 32 lbs per acre.

Scenario Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$320.95

Scenario Cost/Unit: \$320.95

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$7.82	1	\$7.82
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$9.36	1	\$9.36
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.62	90	\$55.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$26.14	2	\$52.28
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	90	\$45.00
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	1	\$46.58
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	90	\$57.60

Practice: 342 - Critical Area Planting

Scenario: #2 - Grass or Grass/legume mix-moderate grading

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of small gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer (6 hours) and then applying fertilizer, lime and seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Apply 90 lbs of nitrogen, 90 lbs of phosphorus, and 90 lbs of potassium, along with an application of 2 tons of lime. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, drill the following mixture for a vegetative cover: Smooth Bromegrass (20 lbs/ac), Perennial Ryegrass (10 lbs/ac), and Red Clover (8 lbs/ac) with a nurse crop of oats at a seeding rate of 32 lbs per acre.

Scenario Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$891.73

Scenario Cost/Unit: \$891.73

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$7.82	1	\$7.82
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	6	\$392.94
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$9.36	1	\$9.36
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	6	\$177.84
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	90	\$57.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$26.14	2	\$52.28
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	1	\$46.58
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.62	90	\$55.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	90	\$45.00

Practice: 342 - Critical Area Planting

Scenario: #3 - Organic Grass or Grass/legume mix-normal tillage

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application. Certified organic seed and fertilizer based upon NOP approved fertilizer inputs will be used where available.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, etc) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind erosion, sheet and rill erosion, or visible rills may have already occurred. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. The plant nutrients will supplied by a blend of organic soil amendments. Apply 90 lbs of nitrogen, 90 lbs of phosphorus, and 90 lbs of potassium, along with an application of 2 tons of lime. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, drill the following mixture for a vegetative cover: Smooth Bromegrass (20 lbs/ac), Perennial Ryegrass (10 lbs/ac), and Red Clover (8 lbs/ac) with a nurse crop of oats at a seeding rate of 32 lbs per acre. Organic seed will be used where available.

Scenario Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$243.55

Scenario Cost/Unit: \$243.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$9.36	1	\$9.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$7.82	1	\$7.82
Materials						
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	1	\$46.58
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.30	90	\$27.00
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.30	90	\$27.00
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.30	90	\$27.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$26.14	2	\$52.28

Practice: 342 - Critical Area Planting

Scenario: #4 - Organic Grass or Grass/legume mix-moderate grading

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of small gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application. Certified organic seed and fertilizer based upon NOP approved fertilizer inputs will be used where available.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer (6 hours) and then applying fertilizer, lime and seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. The plant nutrients will supplied by a blend of organic soil amendments. Apply 90 lbs of nitrogen, 90 lbs of phosphorus, and 90 lbs of potassium, along with an application of 2 tons of lime. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, drill the following mixture for a vegetative cover: Smooth Bromegrass (20 lbs/ac), Perennial Ryegrass (10 lbs/ac), and Red Clover (8 lbs/ac) with a nurse crop of oats at a seeding rate of 32 lbs per acre. Organic seed will be used where available.

Scenario Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$636.49

Scenario Cost/Unit: \$636.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$9.36	1	\$9.36
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$7.82	1	\$7.82
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	6	\$392.94
Materials						
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	1	\$46.58
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$26.14	2	\$52.28
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.30	90	\$27.00
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.30	90	\$27.00
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.30	90	\$27.00

Practice: 342 - Critical Area Planting

Scenario: #5 - Small Area Disturbance

Scenario Description:

Establishment of permanent vegetation on a small site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass seed, fertilizer and lime with application.

Before Situation:

Small area that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as pipeline or seasonal high tunnel. The exposed areas will be subject to wind erosion, sheet and rill erosion, or visible rills may have already occurred. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1000 sq ft critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Apply 90 lbs of nitrogen, 90 lbs of phosphorus, and 90 lbs of potassium, along with an application of 2 tons of lime. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, broadcast the following mixture for a vegetative cover: Tall Fescue (40 lbs/ac), Perennial Ryegrass (25 lbs/ac), and Kentucky Blue (20 lbs/ac).

Scenario Feature Measure: area seeded

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 1

Scenario Cost: \$6.96

Scenario Cost/Unit: \$6.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	\$11.64	0.023	\$0.27
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	0.023	\$0.24
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	0.023	\$0.14
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$9.36	0.023	\$0.22
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$7.82	0.023	\$0.18
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.62	2.07	\$1.28
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	2.07	\$1.04
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$26.14	0.046	\$1.20
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.023	\$1.07
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	2.07	\$1.32

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #1 - Mulch Till Basic

Scenario Description:

Mulch-till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting. This practice includes tillage methods commonly referred to as mulch tillage or chiseling and disking. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops and to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly surface throughout critical wind erosion period. All residue shall be uniformly distributed over the entire field and not burned or removed. These periods of intensive tillage have led to excessive soil loss, often above the Soil Loss Tolerance (T), due to the loss of critical crop or weed residue. The RUSLE2 model will be used to review the farming operation and determine if enough residue is being retained, throughout the rotation, to keep soil loss below T. The producer will then remove operations, or select alternate operations, to reduce erosion below T.

Before Situation:

Row crops such as corn or soybeans are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

Mulch tillage applies to all cropland and other lands where crops are planed. It applies to stubble mulching on summer fallowed land to tillage for annually planted crops and to tillage for plating perennial crops. It also includes some planting operation such as hoe drill, air seeder and no-till drill that disturb a large percentage of soil surface using the planting operation. tillage occurs after crop harvest. In warmer areas, winter weeds or cover crops grow throughout the winter months. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. Wind erosion is reduced by standing residues. Winter weeds or the cover crop is terminated with tillage, a roller-crimper, shredding, or a combination of these methods prior to spring planting as late as feasible. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Scenario Feature Measure: Acre Planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$513.50

Scenario Cost/Unit: \$5.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	50	\$513.50

Practice: 350 - Sediment Basin

Scenario: #1 - Excavated Basin

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin 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. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Excavated volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500

Scenario Cost: \$3,717.09

Scenario Cost/Unit: \$2.48

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$121.14	23	\$2,786.22
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	23	\$681.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 350 - Sediment Basin

Scenario: #2 - Embankment earthen basin with no pipe

Scenario Description:

An low hazard class earthen embankment sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with a principal spillway conduit and earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion leading to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area and using the excavated material to construct the earthen embankment. The embankment will have a constructed auxiliary spillway and a core trench (10' wide, 3' deep, 1:1 slopes) using 1,500 cubic yards of material to create the embankment and core trench. The embankment will be designed and constructed according the Pond standard (378). 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 sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). No principal spillway will be used. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500

Scenario Cost: \$7,913.16

Scenario Cost/Unit: \$5.28

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	\$15.45	4	\$61.80
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	7	\$458.43
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hour	\$355.71	18	\$6,402.78
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	25	\$741.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 350 - Sediment Basin

Scenario: #3 - Embankment earthen basin with pipe

Scenario Description:

An low hazard class earthen embankment sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with a principal spillway conduit and earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion leading to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area and using the excavated material to construct the earthen embankment. The embankment will have a constructed auxiliary spillway and a core trench (10' wide, 3' deep, 1:1 slopes) using 1,500 cubic yards of material to create the embankment and core trench. The embankment will be designed and constructed according the Pond standard (378). 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 sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The principal spillway is created using an approved conduit material and filter diaphragm. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500

Scenario Cost: \$10,466.66

Scenario Cost/Unit: \$6.98

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hour	\$355.71	18	\$6,402.78
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	\$15.45	4	\$61.80
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.49	7	\$458.43
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	25	\$741.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	15	\$579.75
General Labor	231	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	\$20.81	22	\$457.82
Materials						
Trash Guard, metal	1608	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	\$2.42	118	\$285.56
Pipe, PVC, 24", PS 46	1254	Pipe, PVC, PS 46, 24" Diameter - ASTM F679. Material cost only.	Each	\$32.28	6	\$193.68

Materials

Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.50	443	\$664.50
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	13	\$372.19

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
--------------------------------	------	---	------	----------	---	----------

Practice: 351 - Water Well Decommissioning

Scenario: #1 - Hand Dug

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable hand dug or shallow water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Hand dug or shallow well with a 30" diameter casing that is inactive, abandoned, or unusable.

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Typical well is hand dug. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 20

Scenario Cost: \$1,196.49

Scenario Cost/Unit: \$59.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	2.73	\$15.04
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$54.57	1	\$54.57
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.78	1	\$14.78
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	1	\$29.64
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	2	\$62.38
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$768.14	1	\$768.14
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.79	1	\$2.79
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 351 - Water Well Decommissioning

Scenario: #2 - Drilled >100ft

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Drilled well with a 6" diameter casing that is inactive, abandoned, or unusable.

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Typical length of well casing is greater than 100 feet. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 300

Scenario Cost: \$2,103.22

Scenario Cost/Unit: \$7.01

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$54.57	1	\$54.57
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.78	1	\$14.78
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	1	\$29.64
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	2	\$62.38
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$768.14	2.2	\$1,689.91
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.79	1	\$2.79
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 351 - Water Well Decommissioning

Scenario: #3 - Drilled ≤100 ft

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Drilled well with a 6" diameter casing that is inactive, abandoned, or unusable.

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Typical length of well casing is 100 feet or less. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$974.05

Scenario Cost/Unit: \$974.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.78	1	\$14.78
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$54.57	1	\$54.57
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	2	\$62.38
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators ≥50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers ≥12", Dump Trucks, Ag Equipment ≥150 HP, Scrapers, Water Wagons.	Hour	\$29.64	1	\$29.64
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.79	1	\$2.79
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$768.14	0.73	\$560.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 355 - Well Water Testing

Scenario: #1 - Basic Water Test

Scenario Description:

Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be acceptable.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible.

After Situation:

Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$51.05

Scenario Cost/Unit: \$51.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
General Labor	231	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	\$20.81	0.5	\$10.41
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	\$40.64	1	\$40.64

Practice: 355 - Well Water Testing

Scenario: #2 - Specialty Water Test

Scenario Description:

Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is possible.

After Situation:

Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$207.70

Scenario Cost/Unit: \$207.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
General Labor	231	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	\$20.81	0.5	\$10.41
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	\$40.64	1	\$40.64
Test, singular specialized water test, well water	2003	Testing for specific pesticide, inorganic chemical or volatile organic not included in a basic well suitability test.. Includes materials and shipping only.	Each	\$156.65	1	\$156.65

Practice: 355 - Well Water Testing

Scenario: #3 - Full Spectrum Test

Scenario Description:

Typical scenario includes the professional comprehensive testing for all less common substances, to include: pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is known to be degraded due to a specialized substance but thorough analysis is warranted.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, sewage sludge, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is likely.

After Situation:

Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$252.78

Scenario Cost/Unit: \$252.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
General Labor	231	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	\$20.81	0.5	\$10.41
Materials						
Test, comprehensive specialized water test, well water	2002	Comprehensive testing for a broad spectrum of pesticides, inorganic chemicals or volatile organics not included in a basic well suitability test. Includes materials and shipping only.	Each	\$202.32	1	\$202.32
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	\$40.05	1	\$40.05

Practice: 356 - Dike

Scenario: #1 - Dike

Scenario Description:

Construction a barrier of either earth or manufatcured materials for the purpose of the protetion of people or property from floods or to control water levels in connection with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance.

After Situation:

Water level is controlled by a stable earthen structure installed with compacted fill material. Material haul < 1 mile. Typical earthen dike assumed 1000 lineal feet, Class II (6 ft. in height, 8 ft. top width, 2H:1V side slopes). Potential hazard to public safety, land or property mitigated; environmental benefit provided. Scenario includes component for stripping and stockpiling base of dike. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Scenario Feature Measure: Cubic Yards of Earthmoving

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,444

Scenario Cost: \$21,841.35

Scenario Cost/Unit: \$4.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	5036	\$21,100.84
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	592	\$491.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 356 - Dike

Scenario: #2 - Dike with Core Trench

Scenario Description:

Construction a barrier of either earth or manufatcured materials for the purpose of the protetion of people or property from floods or to control water levels in connection with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance.

After Situation:

Water level is controlled by a stable earthen structure installed with compacted fill material. Material haul < 1 mile. Typical earthen dike assumed 1000 lineal feet, Class II (6 ft. in height, 8 ft. top width, 2H:1V side slopes). Potential hazard to public safety, land or property mitigated; environmental benefit provided. This scenario includes the excavation and placement of a core trench. Scenario includes component for stripping and stockpiling base of dikeAssociated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Scenario Feature Measure: Cubic Yards of Earthmoving

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,444

Scenario Cost: \$28,770.09

Scenario Cost/Unit: \$6.47

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	6258	\$26,221.02
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$1.48	1222	\$1,808.56
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	592	\$491.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 356 - Dike

Scenario: #3 - Dike with Rip Rap

Scenario Description:

Construction a barrier of either earth or manufactured materials for the purpose of the protection of people or property from floods or to control water levels in connection with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Inside bank of dike is armored with riprap.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance.

After Situation:

Water level is controlled by a stable earthen structure installed with compacted fill material. Material haul < 1 mile. Typical earthen dike assumed 1000 lineal feet, Class II (6 ft. in height, 8 ft. top width, 2H:1V side slopes). Potential hazard to public safety, land or property mitigated; environmental benefit provided. Inside bank of dike armored with riprap to protect from rodent damage. Scenario includes component for stripping and stockpiling base of dike. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Scenario Feature Measure: Cubic Yards of Earthmoving

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,444

Scenario Cost: \$36,127.56

Scenario Cost/Unit: \$8.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	592	\$491.36
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	5036	\$21,100.84
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$23.93	597	\$14,286.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 356 - Dike

Scenario: #4 - Dike with 1&2 Stone

Scenario Description:

Construction a barrier of either earth or manufactured materials for the purpose of the protection of people or property from floods or to control water levels in connection with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Inside bank of dike is armored with #1 and 2 stone.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance.

After Situation:

Water level is controlled by a stable earthen structure installed with compacted fill material. Material haul < 1 mile. Typical earthen dike assumed 1000 lineal feet, Class II (6 ft. in height, 8 ft. top width, 2H:1V side slopes). Potential hazard to public safety, land or property mitigated; environmental benefit provided. Inside bank of dike armored with #1 and 2 stone to protect from rodent damage. Scenario includes component for stripping and stockpiling base of dike. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Scenario Feature Measure: Cubic Yards of Earthmoving

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,444

Scenario Cost: \$32,662.08

Scenario Cost/Unit: \$7.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	5036	\$21,100.84
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	592	\$491.36
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	373	\$10,820.73
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 359 - Waste Treatment Lagoon

Scenario: #1 - Waste Treatment Lagoon

Scenario Description:

A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard.

Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Solid/Liquid Waste Separation Facility (632).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and/or other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A waste treatment lagoon constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design size : Design Volume 439,440 ft³; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13'

Scenario Feature Measure: Total Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 492,128

Scenario Cost: \$73,256.24

Scenario Cost/Unit: \$0.15

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	1389	\$1,152.87
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	2778	\$11,639.82
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$3.44	8101	\$27,867.44
Excavation, common earth, large equipment, 150 ft	1223	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	\$3.51	9125	\$32,028.75
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	2	\$62.38
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	\$3.66	8	\$29.28
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70

Practice: 360 - Waste Facility Closure

Scenario: #3 - Demolition of Concrete Waste Storage Structure

Scenario Description:

Demolition of a concrete waste storage structure. Payment includes all materials and labor to demolish the structure, remove the concrete and earthfill the site. The scenario does not include payment for removal of manure as this would be accomplished as part of normal operation and maintenance when the facility was operating. A concrete structure left full of manure creates a toxic situation that would not be in compliance with normal operation and maintenance. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.

Before Situation:

An existing concrete waste storage structure is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a concrete waste storage structure, with top dimensions of 60 ft x 60 ft with 10 ft vertical walls. The walls are 8 inches thick and the concrete floor is 5 inches thick. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet ((4 X 60 ft X 10 ft) X 8in /12 in/ft) + [60 ft X 60 ft X 5in /12 in/ft] + [240 X 2 sqft / ft footing]). The volume of earthwork (earthfill and/or excavation, final grading) required is approximately 50% of the structural volume. The concrete will be demolished and hauled off-site for recycling or disposal. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. All waste material shall be land applied in accordance with Nutrient Management (590). Excavated areas will be filled in. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Demolition of the concrete waste structure will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Associated practices: Nutrient Management (590), Critical Area Planting (342)

Scenario Feature Measure: Cubic Feet of concrete to be demolished

Scenario Unit: Cubic Foot

Scenario Typical Size: 3,580

Scenario Cost: \$9,157.40

Scenario Cost/Unit: \$2.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	\$17.45	133	\$2,320.85
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	667	\$2,794.73
Hauling, bulk, highway truck	1615	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	\$0.32	3990	\$1,276.80
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	8	\$889.12
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	8	\$237.12
General Labor	231	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	\$20.81	8	\$166.48
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	4	\$996.60
--------------------------------	------	---	------	----------	---	----------

Practice: 360 - Waste Facility Closure

Scenario: #4 - Earthen Basin Closure with Sludge Removal

Scenario Description:

Decommissioning of an earthen liquid waste impoundment (embankment or excavated type). Payment includes the removal and spreading of accumulated sludge and the removal of contaminated soil at the soil/sludge interface, and equipment and labor required to close the impoundment in an environmentally safe manner. If present, the synthetic liner will be removed and properly disposed of. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.

Before Situation:

An existing lagoon or earthen waste storage basin is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage basin, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 3:1 side slopes. The 8 ft total depth is the height of the earthen berm above the bottom of the basin for a total structural storage volume equal to 63,500 cubic feet. The volume of sludge and contaminated soil is 20% of the structural volume, 12,700 cu ft. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). The volume of earthwork (earthfill and excavation) required to fill in the impoundment and perform final grading of the site is approximately 40% of the structural volume, 25,400. Structural removal, as necessary, may include the removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be excavated and used for levelling or manipulating the site so not to impound surface water. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Associated practices: Nutrient Management (590), Critical Area Planting (342)

Scenario Feature Measure: Cubic feet of sludge removed

Scenario Unit: Cubic Foot

Scenario Typical Size: 12,700

Scenario Cost: \$12,560.29

Scenario Cost/Unit: \$0.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	249	\$560.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	12	\$1,333.68
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	588	\$2,463.72
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.76	940	\$1,654.40
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	\$0.29	17056	\$4,946.24
Labor						
General Labor	231	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	\$20.81	12	\$249.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	12	\$355.68

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	4	\$996.60
--------------------------------	------	---	------	----------	---	----------

Practice: 360 - Waste Facility Closure

Scenario: #5 - Earthen Basin Closure no Sludge Removal

Scenario Description:

Decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where there is no accumulated sludge that needs to be removed. Payment includes equipment and labor required to close the impoundment in an environmentally safe manner. If present, the synthetic liner will be removed and properly disposed of. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.

Before Situation:

An existing lagoon or earthen waste storage basin is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage basin, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 3:1 side slopes. The 8 ft total depth is the height of the earthen berm above the bottom of the basin for a total structural storage volume equal to 63,500 cubic feet. The volume of sludge and contaminated soil is such that removal is not necessary. The volume of earthwork (excavation) required to fill in the impoundment and perform final grading of the site is approximately 40% of the total structural storage volume (63,500 * 0.4 = 25,400). Earthfill is assumed to be 50% of the excavation amount. Structural removal, as necessary, may include the removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be excavated and used for levelling or manipulating the site so not to impound surface water. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Associated practices: Nutrient Management (590), Critical Area Planting (342)

Scenario Feature Measure: Cubic feet of berm removed

Scenario Unit: Cubic Foot

Scenario Typical Size: 25,400

Scenario Cost: \$6,061.08

Scenario Cost/Unit: \$0.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.76	940	\$1,654.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	470	\$1,969.30
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	12	\$1,333.68
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	12	\$355.68
General Labor	231	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	\$20.81	12	\$249.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 362 - Diversion

Scenario: #1 - Small, <2 CY/FT

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet, or other suitable outlet. Scenario is for diversions requiring less than 2 CY of excavation per foot of diversion. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Scenario assumes a typical installation of a diversion 1000 feet long installed using a dozer. Diversion is 2.5' tall with 4' wide top width and slopes 3:1. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Scenario Feature Measure: Length of Diversion

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000

Scenario Cost: \$3,329.07

Scenario Cost/Unit: \$3.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.38	1000	\$2,380.00
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	700	\$581.00
Labor						
General Labor	231	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	\$20.81	2	\$41.62
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	2	\$77.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 362 - Diversion

Scenario: #3 - Large, ≥3 CY/FT

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet, or other suitable outlet. Scenario is for diversions requiring greater than or equal to 3 CY of excavation per foot of diversion. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Scenario assumes a typical installation of a diversion 1000 feet long installed using a dozer. Diversion is 5' tall with 4' wide top width and slopes 3:1. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Scenario Feature Measure: Length of Diversion

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: \$9,694.07

Scenario Cost/Unit: \$9.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.38	3500	\$8,330.00
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	1200	\$996.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	2	\$77.30
General Labor	231	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	\$20.81	2	\$41.62
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 362 - Diversion

Scenario: #2 - Medium, 2 - 2.9 CY/FT

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet, or other suitable outlet. Scenario is for diversions requiring 2 CY to 2.9 CY of excavation per foot of diversion. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Scenario assumes a typical installation of a diversion 1000 feet long installed using a dozer. Diversion is 4' tall with 4' wide top width and slopes 3:1. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Scenario Feature Measure: Length of Diversion

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: \$7,148.07

Scenario Cost/Unit: \$7.15

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.83	1000	\$830.00
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.38	2500	\$5,950.00
Labor						
General Labor	231	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	\$20.81	2	\$41.62
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	2	\$77.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 366 - Anaerobic Digester

Scenario: #1 - Small Plug Flow <1000 AU

Scenario Description:

A plug flow anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a plug flow digester for a livestock operation with less than 1,000 animal units. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan.

A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 910 animal units (650 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 910

Scenario Cost: \$643,880.33

Scenario Cost/Unit: \$707.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	2	\$88.36
Equipment/Installation						
Plug Flow, Small (less than 1,000 animal units)	2478	Concrete plug flow anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operat	Each	#####	1	\$642,998.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 366 - Anaerobic Digester

Scenario: #2 - Medium Plug Flow 1000-2000 AU

Scenario Description:

A plug flow anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a plug flow digester for a livestock operation with 1,000 to 2,000 animal units. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan.

A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical design scenario: 1,750 animal units (1,250 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,750

Scenario Cost: \$881,163.74

Scenario Cost/Unit: \$503.52

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	2	\$88.36
Equipment/Installation						
Plug Flow, Medium (between 1,000 and 2,000 animal units)	2479	Concrete plug flow anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operat	Each	#####	1	\$880,281.73
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 366 - Anaerobic Digester

Scenario: #3 - Large Plug Flow >2000 AU

Scenario Description:

A plug flow anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a plug flow digester for a livestock operation with more than 2,000 animal units. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan.

A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source).

Typical Design Scenario: 3,920 animal units (2,800 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 3,920

Scenario Cost: \$1,318,352.23

Scenario Cost/Unit: \$336.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	2	\$88.36
Equipment/Installation						
Plug Flow, Large (more than 2,000 animal units)	2480	Concrete plug flow anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operat	Each	#####	1	#####
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 366 - Anaerobic Digester

Scenario: #4 - Small Complete Mix <1000 AU

Scenario Description:

A complete mix anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a complete mix system for a livestock operation with less than 1,000 animal units. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan.

A complete mix digester is typically a round above ground structure constructed of concrete or steel. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 1,039 animal units (742 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,039

Scenario Cost: \$738,648.03

Scenario Cost/Unit: \$710.92

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	2	\$88.36
Equipment/Installation						
Complete Mix, Small (less than 1,000 animal units)	2481	A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary	Each	#####	1	\$737,766.02
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70

Practice: 366 - Anaerobic Digester

Scenario: #5 - Medium Complete Mix 1000-2000 AU

Scenario Description:

A complete mix anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a complete mix system for a livestock operation with 1,000 to 2,000 animal units. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan.

A complete mix digester is typically a round above ground structure constructed of concrete or steel. The typical scenario also includes items necessary to maintain mesophilic or thermophilic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 1,890 animal units (1,350 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,890

Scenario Cost: \$1,288,556.70

Scenario Cost/Unit: \$681.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	2	\$88.36
Equipment/Installation						
Complete Mix, Medium (between 1,000 and 2,500 animal units)	2482	A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary	Each	#####	1	#####
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 366 - Anaerobic Digester

Scenario: #6 - Large Complete Mix >2,000 AU

Scenario Description:

A complete mix anaerobic digester that is part of a waste management system for the biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a complete mix system for a livestock operation with more than 2,000 animal units. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. A complete mix digester is typically a round above ground structure constructed of concrete or steel. The typical scenario also includes items necessary to maintain mesophylic or thermophylic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario: 3,220 animal units (2,300 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 3,220

Scenario Cost: \$1,496,383.31

Scenario Cost/Unit: \$464.72

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	2	\$88.36
Equipment/Installation						
Complete Mix, Large (more than 2,500 animal units)	2483	A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary	Each	#####	1	#####
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 366 - Anaerobic Digester

Scenario: #7 - Covered Lagoon/Holding Pond

Scenario Description:

A covered lagoon that is part of a waste management system to provide biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for all livestock operation sizes. Scenario applies to retrofitting an existing anaerobic lagoon, or as an addition to a new construction using waste treatment lagoon (359) or waste storage facility (313), and roofs and covers (367). Payment includes system controls, gas collection, and flaring system. Energy generation is not included with this scenario.

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. A covered lagoon/holding pond typically has a flexible top installed over an earthen storage/treatment facility for the purpose of capturing the biogas. Typical Design Scenario: 1,000 animal units (715 - 1,400 lbs dairy cows).

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,000

Scenario Cost: \$107,362.13

Scenario Cost/Unit: \$107.36

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$44.18	1	\$44.18
Equipment/Installation						
Covered Lagoon (not including the lagoon or the associated cover)	2484	Piping and collection system for biogas, controls for operating the digester system, flare excess gas to convert from methane to carbon dioxide Includes material, labor, and equipment.	Each	#####	1	\$107,000.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Practice: 367 - Roofs and Covers

Scenario: #1 - Roof Structure, less than 33 feet Wide

Scenario Description:

A timber or steel framed roof structure with a wood sheathing, steel "sheet" or fabric-like roof. Scenario does not include foundation costs. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Obstruction Removal (500), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber or steel framed roof structure with a wood sheathing, steel "sheet" or fabric-like roof. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 1000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Roof Area

Scenario Unit: Square Foot

Scenario Typical Size: 1,000

Scenario Cost: \$14,367.95

Scenario Cost/Unit: \$14.37

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building, less than 30' wide	1672	Post Frame Building, no sides, - less than 30' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipp	Square Foot	\$14.05	1000	\$14,050.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 367 - Roofs and Covers

Scenario: #2 - Roof Structure, 33 feet to 60 feet Wide

Scenario Description:

A timber or steel framed roof structure with a wood sheathing, steel "sheet" or fabric-like roof. Scenario does not include foundation costs. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Obstruction Removal (500), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber or steel framed roof structure with a wood sheathing, steel "sheet" or fabric-like roof. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 7,500 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Roof Area

Scenario Unit: Square Foot

Scenario Typical Size: 7,500

Scenario Cost: \$40,817.95

Scenario Cost/Unit: \$5.44

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building, 30' to 60' wide	1676	Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping	Square Foot	\$5.40	7500	\$40,500.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 367 - Roofs and Covers

Scenario: #3 - Roof Structure, more than 60 feet Wide

Scenario Description:

A timber or steel framed roof structure with a wood sheathing, steel "sheet" or fabric-like roof. Scenario does not include foundation costs. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Obstruction Removal (500), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber or steel framed roof structure with a wood sheathing, steel "sheet" or fabric-like roof. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 24,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Roof Area

Scenario Unit: Square Foot

Scenario Typical Size: 24,000

Scenario Cost: \$161,597.95

Scenario Cost/Unit: \$6.73

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building, greater than 60' wide	1673	Post Frame Building, no sides, - greater than 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, sh	Square Foot	\$6.72	24000	\$161,280.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 367 - Roofs and Covers

Scenario: #4 - Roof structure with foundation

Scenario Description:

A timber or steel framed roof structure with a wood sheathing or steel "sheet" roof. Scenario includes foundation costs. Roof support is separate from associated manure storage structure, or roof structure may be used to cover an existing feed lot to eliminate runoff from rainfall events. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Obstruction Removal (500), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber or steel framed roof structure with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 7,500 square feet and is over an approved animal waste management facility or feedlot as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Roof Area

Scenario Unit: Square Foot

Scenario Typical Size: 7,500

Scenario Cost: \$53,313.84

Scenario Cost/Unit: \$7.11

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	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	\$406.76	29	\$11,796.04
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	5	\$40.75
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$42.05	10	\$420.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	10	\$238.60
Materials						
Roof, Post Frame Building, 30' to 60' wide	1676	Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping	Square Foot	\$5.40	7500	\$40,500.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 367 - Roofs and Covers

Scenario: #5 - Flexible Membrane Cover with gas collection

Scenario Description:

A fabricated rigid, semi-rigid, or flexible membrane covering the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester) with typical size of one acre. Cover will exclude precipitation and capture biogas for controlled release or flaring, to improve air quality and enable the production of renewable energy. Not to be used with 366-Covered Lagoon scenario.

Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

A waste storage or treatment facility is uncovered, emitting significant quantities of methane and volatile organic compounds which contribute to climate change and cause odor problems. Rainfall on the surface of the impoundment increases the volume of contaminated liquid that needs to be stored and/or treated. The energy potential of the biogas is untapped.

After Situation:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. Rainfall is excluded, minimizing the volume of contaminated liquid to be stored and/or treated. Air quality in the vicinity of the facility is improved, and the biogas is collected and made available for potential use as heat or energy generation.

Scenario Feature Measure: Surface Area of Facility Covered

Scenario Unit: Square Foot

Scenario Typical Size: 43,560

Scenario Cost: \$333,061.09

Scenario Cost/Unit: \$7.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	717	\$1,613.25
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$128.74	287	\$36,948.38
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	430	\$1,801.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	150	\$5,797.50
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	1200	\$37,428.00
Materials						
Ballast tube	2436	Ballast tube filled with sand or concrete slurry installed at regular intervals on geomembrane floating cover to provide weight to tension the cover, protect against wind damage, control rainwater and facilitate walkway access. Includes materials and shi	Foot	\$36.45	1880	\$68,526.00
Covered Lagoon Gas Collection System	1664	Piping and collection system for biogas. Includes labor and equipment.	Each	\$39,705.31	1	\$39,705.31
Covered Lagoon Flare	1666	Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment.	Each	\$12,791.17	1	\$12,791.17
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Foot	\$1.09	58564	\$63,834.76

Materials

Access Hatch	2433	Flotation and finishing details for sealable opening to allow access of mixing or sampling equipment through geomembrane floating cover. Includes materials and shipping only.	Each	\$5,143.82	5	\$25,719.10
Relief Vent	2435	Emergency biogas relief vent (burp valve) to be installed at selected locations on geomembrane floating cover. Includes materials and shipping only.	Each	\$772.15	22	\$16,987.30
Float, Encapsulated Foam	2434	Flotation pocket with closed cell foam to be installed at regular intervals on geomembrane floating cover to transfer biogas to perimeter and facilitate walkway access. Includes materials and shipping only.	Foot	\$10.38	2068	\$21,465.84

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	4	\$275.20
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 367 - Roofs and Covers

Scenario: #6 - Flexible Membrane Cover

Scenario Description:

A fabricated rigid, semi-rigid, or flexible membrane covering the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester) with typical size of one acre. Cover will exclude precipitation and improve air quality.

Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

A waste storage or treatment facility is uncovered, emitting significant quantities of methane and volatile organic compounds which contribute to climate change and cause odor problems. Rainfall on the surface of the impoundment increases the volume of contaminated liquid that needs to be stored and/or treated.

After Situation:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. Rainfall is excluded, minimizing the volume of contaminated liquid to be stored and/or treated. Air quality in the vicinity of the facility is improved.

Scenario Feature Measure: Surface Area of Facility Covered

Scenario Unit: Square Foot

Scenario Typical Size: 43,560

Scenario Cost: \$207,747.27

Scenario Cost/Unit: \$4.77

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$128.74	287	\$36,948.38
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	717	\$1,613.25
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$4.19	430	\$1,801.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	120	\$4,638.00
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	960	\$29,942.40
Materials						
Ballast tube	2436	Ballast tube filled with sand or concrete slurry installed at regular intervals on geomembrane floating cover to provide weight to tension the cover, protect against wind damage, control rainwater and facilitate walkway access. Includes materials and shi	Foot	\$36.45	1880	\$68,526.00
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Foot	\$1.09	58564	\$63,834.76
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	4	\$275.20
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 367 - Roofs and Covers

Scenario: #7 - Modular Floating Cover

Scenario Description:

A permeable floating composite cover is deployed on the liquid surface of a 70 foot diameter waste storage facility. The permeable composite cover utilizes fabricated shapes or tiles that fit together to cover a minimum of 90% of the liquid surface of a waste storage facility. The waste storage volume must be documented in the CNMP as adequate to store the waste product and rainfall on the surface of the facility for the intended period without any credit for evaporative loss. Installation of the practice will address air quality by reducing emissions of odors and ammonia.

Associated practices include Waste Storage Facility (313), and Waste Treatment Lagoon (359)

Before Situation:

Applicable where an existing or planned animal waste storage or treatment lagoon is creating significant air quality concerns due to odor problems and the release of ammonia as a fine particulate matter precursor. Installation will improve the management of an existing or planned system to control the release of odors as well as ammonia to improve air quality as part of the existing or planned animal waste management system.

After Situation:

A permeable modular cover over an animal waste storage or treatment facility. Installation of the modular floating tiles will improve air quality by reducing emissions of odors and ammonia. The typical waste storage structure treated has a liquid surface area of 70 foot diameter, or 3,848 square feet. Associated practices include Waste Storage Facility (313) and Waste Treatment Lagoon (359).

Scenario Feature Measure: Surface Area of Liquid Manure Storage Tank

Scenario Unit: Square Foot

Scenario Typical Size: 3,848

Scenario Cost: \$25,012.22

Scenario Cost/Unit: \$6.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	\$53.21	2	\$106.42
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	2	\$47.72
Materials						
Composite Cover, floating tile, ≤ 5,000 square foot	1683	Composite material that is used to cover open storages with an area less than 5,000 sf. Example, Hexa-Cover. Materials only.	Square Foot	\$6.46	3848	\$24,858.08

Practice: 371 - Air Filtration and Scrubbing

Scenario: #1 - Single Pit Fan Biofilter

Scenario Description:

Establishment of a biofilter used to treat the air flow from a single waste pit ventilation fan in instances where control of the exhaust from all pit ventilation fans is not needed. Adequate moisture in the wood chip media is maintained for proper growth of bacteria. For each waste pit ventilation fan servicing a waste storage facility that is identified as exhausting odorous and/or particulate laden air into the atmosphere, a separate biofilter is installed. Payment includes materials, equipment, and labor costs for installing the biofilter. A stabilized area around the biofilter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed.

Before Situation:

One or more pit ventilation fans of a manure storage facility on a Headquarters site are exhausting odorous and/or particulate laden air into the atmosphere.

After Situation:

Air Quality resource concerns are addressed through installation of the practice by reducing odors and/or particulate matter emissions. Exhaust from a 24" waste pit ventilation fan is piped to a 16' wide by 20' long by 4' high horizontal biofilter constructed of a formed concrete bin that is filled with wood chip media, capable of handling 5,500 cubic feet per minute of airflow. The loading of odor and/or particulates into the air at the production facility is significantly reduced, resulting in a substantial improvement in air quality. Ammonia emissions are reduced approximately 60%; hydrogen sulfide about 80% and odor 60 to 80%.

Associated practices include Heavy Use Area Protection (561), Amendments for Treatment of Agricultural Waste (591), Windbreak (380), Waste Storage Facility (313)and CAP-Comprehensive Air Quality Management Plan (126).

Scenario Feature Measure: Number of Biofilters Installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$11,479.69

Scenario Cost/Unit: \$11,479.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic yard	\$22.58	24	\$541.92
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	8	\$289.76
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.25	33	\$74.25
Concrete, CIP, formed reinforced	38	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	\$406.76	11.3	\$4,596.39
Concrete, CIP, slab on grade, reinforced	37	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	\$128.74	10	\$1,287.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	2	\$62.38
General Labor	231	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	\$20.81	6	\$124.86
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$153.22	1	\$153.22

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$29.01	11	\$319.11
Articulated block	1906	Articulated precast concrete blocks with a typical thickness of 4.5 inches. Includes materials only.	Square Foot	\$5.25	320	\$1,680.00
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.13	36	\$40.68
Pipe, PVC, 24", SCH 40	2046	Materials: - 24" - PVC - SCH 40 - ASTM D1785	Foot	\$38.98	40	\$1,559.20
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.83	80	\$66.40
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Foot	\$0.32	100	\$32.00
Pump, ≤ 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and moto	Horsepower	\$399.47	0.25	\$99.87
Pipe, PE, 3/4", DR 9	996	Materials: - 3/4" - PE - 160 psi - ASTM D3035 DR 9	Foot	\$0.43	50	\$21.50
Pump, ≤ 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will	Each	\$530.75	1	\$530.75

Practice: 374 - Farmstead Energy Improvement

Scenario: #1 - Ventilation - Exhaust

Scenario Description:

Replacement of an exhaust fan with a more efficient exhaust fan. Payment includes fan, controls, wiring, associated appurtenances and labor to install.

Before Situation:

Inefficient ventilation in an agricultural building.

After Situation:

High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,305.00

Scenario Cost/Unit: \$1,305.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	3	\$93.57
Materials						
Fan, exhaust, 36" High Efficiency	1185	36 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$1,082.63	0.25	\$270.66
Fan, exhaust, 54" High Efficiency	1188	54 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$1,015.28	0.25	\$253.82
Fan, exhaust, 48" High Efficiency	1187	48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$1,256.76	0.25	\$314.19
Fan, exhaust, 42" High Efficiency	1186	42 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$1,491.04	0.25	\$372.76

Practice: 374 - Farmstead Energy Improvement

Scenario: #2 - Ventilation - Horizontal Air Flow/Stir Fan

Scenario Description:

A system of fans are installed where none exist to create a horizontal air circulation pattern, and remove air stratification. The new system promotes efficient heat and moisture distribution. Payment includes fan controls, wiring, associated appurtenances and labor to install.

Before Situation:

Inefficient air circulation system in a greenhouse or livestock house

After Situation:

High-efficiency air circulation system which reduces energy use. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 4

Scenario Cost: \$831.72

Scenario Cost/Unit: \$207.93

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Fan, HAF, 1/10 to 1/15 HP	1189	High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$145.55	4	\$582.20

Practice: 374 - Farmstead Energy Improvement

Scenario: #3 - Ventilation - Cool Cell, Evaporative Cooling System

Scenario Description:

A cool cell evaporative cooling system is installed in a livestock barn to reduce total ventilation requirements in hot weather. Scenario is applicable where there is an existing, inefficient cooling system/ventilation system in place that will be replaced by the cool cell. Payment includes all materials and labor to install the evaporative cooling system.

Before Situation:

Inefficient ventilation temperature control in a poultry or livestock house

After Situation:

A cool cell evaporative cooling system reduces energy use by allowing lower ventilation rates that will result in net energy savings. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Square Foot

Scenario Unit: Square Foot

Scenario Typical Size: 520

Scenario Cost: \$14,137.84

Scenario Cost/Unit: \$27.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	96	\$2,994.24
Materials						
Evaporative Cooling System, Large	2400	Energy efficient cooling systems installed in ventilated livestock confinement or greenhouses for temperature control. Complete system with cooling pads, aluminum distribution and end panels, 1/3 HP submersible sump pump and plumbing kit. Greater than 9	Square Foot	\$21.43	520	\$11,143.60

Practice: 374 - Farmstead Energy Improvement

Scenario: #4 - Refrigeration - Plate Cooler

Scenario Description:

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. Pament includes plate cooler and labor to install.

Before Situation:

Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:

High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672-Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$4,810.54

Scenario Cost/Unit: \$4,810.54

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Plate Cooler, ≤ 499 gal/hr capacity	1176	Stainless Steel, dual pass plate cooler with < 499 gallon/hour capacity. Includes materials and shipping only.	Each	\$4,561.02	1	\$4,561.02

Practice: 374 - Farmstead Energy Improvement

Scenario: #5 - Refrigeration - Scroll Compressor

Scenario Description:

Install a new comparably sized scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Payment includes compressor, controls, wiring, appurtenances and labor to install.

Before Situation:

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

After Situation:

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 5

Scenario Cost: \$2,720.00

Scenario Cost/Unit: \$544.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	4	\$124.76
Materials						
Scroll Compressor - 5 HP	1183	Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	\$2,595.24	1	\$2,595.24

Practice: 374 - Farmstead Energy Improvement

Scenario: #6 - Refrigeration - Compressor Heat Recovery System

Scenario Description:

Install a new comparibly sized compressor heat recovery unit. The unit includes insulated storage tanks with heat exchangers added to a refrigeration system. The system utilizes the heat extracted from the fluid (e.g. milk) that passes through the hot gas refrigerant line from the refrigeration system's compressors, to pre-heat water to approximately 110°F before it enters a conventional water heater. Energy savings comes from the reduced heating required in a water heater. Low ambient controls and/or condenser variable speed drives are part of the installation. The actual number of heat recovery units and their location will depend on the operating hours of the compressor and the configuration of the existing system. Payment includes all materials and appurtanences and labor to install.

Before Situation:

Inefficient use of heat extracted from the milk during the cooling process

After Situation:

A more efficient compressor heat recovery system is installed, which will reduce energy use, is evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$3,615.92

Scenario Cost/Unit: \$3,615.92

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Compressor heat recovery (CHR) unit, High Efficiency	1899	Compressor heat recovery (CHR) units (insulated storage tanks with heat exchangers) added to a refrigeration system, use the heat extracted from a warm fluid (e.g., milk) that passes through the hot gas refrigerant line from the refrigeration system's co	Each	\$3,366.40	1	\$3,366.40

Practice: 374 - Farmstead Energy Improvement

Scenario: #7 - Controller - Variable Speed Drive for ≤1 HP Motor

Scenario Description:

Installation of a variable speed drive (VSD) for a ≤1 horsepower electric motor typically used in small dairy operations. Payment includes appurtenances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. and labor to install. Payment does not include the cost of the motor.

Before Situation:

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements.

Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 1

Scenario Cost: \$4,054.24

Scenario Cost/Unit: \$4,054.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Variable Speed Drive, 1 HP	2347	Variable speed drive for 1 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	\$3,804.72	1	\$3,804.72

Practice: 374 - Farmstead Energy Improvement

Scenario: #8 - Controller - Variable Speed Drive for >1 to <10 HP Motor

Scenario Description:

Installation of a variable speed drive (VSD) for a >1 to <10 horsepower electric motor. Payment includes appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. and labor to install. Payment does not include the cost of the motor.

Before Situation:

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 5

Scenario Cost: \$5,391.02

Scenario Cost/Unit: \$1,078.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Variable Speed Drive, 5 HP	2348	Variable speed drive for 5 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	\$1,028.30	5	\$5,141.50

Practice: 374 - Farmstead Energy Improvement

Scenario: #9 - Controller - Variable Speed Drive for 10 to <50 HP Motor

Scenario Description:

Installation of a variable speed drive (VSD) for a >10 to <50 horsepower electric motor typically used in small dairy operations. Payment includes appurtenances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. and labor to install. Payment does not include the cost of the motor.

Before Situation:

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements.

Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 10

Scenario Cost: \$7,036.32

Scenario Cost/Unit: \$703.63

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Variable Speed Drive, 10 HP	1287	Variable speed drive for 10 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	\$678.68	10	\$6,786.80

Practice: 374 - Farmstead Energy Improvement

Scenario: #10 - Controller - Variable Speed Drive for ≥ 50 HP Motor

Scenario Description:

Installation of a variable speed drive (VSD) for a ≥ 50 horsepower electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. Payment includes appurtenances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. and labor to install.

Before Situation:

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements.

Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 100

Scenario Cost: \$12,357.52

Scenario Cost/Unit: \$123.58

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Variable Speed Drive, 100 HP	1289	Variable speed drive for 100 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	\$121.08	100	\$12,108.00

Practice: 374 - Farmstead Energy Improvement

Scenario: #11 - Controller - Single Function Automatic Controller System

Scenario Description:

The typical scenario consists of a single function automatic control system installed on an existing manually controlled agricultural system such as, but not limited to, irrigation systems or agricultural building control systems. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay. Payment includes materials and appurtanences and labor to install.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,423.70

Scenario Cost/Unit: \$1,423.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	8	\$249.52
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$153.22	1	\$153.22
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	\$415.23	1	\$415.23
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$605.73	1	\$605.73

Practice: 374 - Farmstead Energy Improvement

Scenario: #12 - Controller - Multiple Function Automatic Controller System

Scenario Description:

The typical scenario consists of a multiple function automatic control system installed on an existing manually controlled agricultural system such as, but not limited to, agricultural building control systems. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay. Payment includes materials and appurtenances and labor to install.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$4,374.24

Scenario Cost/Unit: \$4,374.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	38	\$1,185.22
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$153.22	5	\$766.10
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$605.73	4	\$2,422.92

Practice: 374 - Farmstead Energy Improvement

Scenario: #18 - Heating - Radiant Systems

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Tube Heaters, or similar. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and winch system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as indicated in the energy audit. Payment includes materials and labor to install the new system.

Before Situation:

Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder. A large number of brooders are required to cover a significant percent of floor space. As the warmed air naturally rises it loses effectiveness for poultry on the ground.

After Situation:

Energy use is reduced through installation of a more efficient heater. Radiant tube heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. The typical scenario consists of the replacement of 28 brood heaters with 6 radiant tube heaters. Associated practices/activities may include: 122-AgEMP - HQ, 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Rated Heat Output

Scenario Unit: 1,000 BTU/Hour

Scenario Typical Size: 125

Scenario Cost: \$1,458.56

Scenario Cost/Unit: \$11.67

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	2	\$62.38
Materials						
Heater, radiant tube	1163	Radiant tube heater rated at 125,000 BTU/hour. Materials only.	Each	\$1,396.18	1	\$1,396.18

Practice: 374 - Farmstead Energy Improvement

Scenario: #19 - Heating - Building

Scenario Description:

Replace existing low efficiency heaters with new high efficiency heaters. High-efficiency heating systems include any heating unit with efficiency rating of 80%+ for fuel oil and 90%+ for natural gas and propane. Applications may be air heating/building environment and hydronic (boiler) heating for agricultural operations, including under bench, or root zone heating. An alternative to heater replacement might be the addition of climate control system and electronic temperature controls with +/- 1 degree F differential, to reduce the annual run time. Payment includes heater and labor to install.

Before Situation:

Buildings heated with low efficiency heaters or heaters without proper electronic climate controls

After Situation:

Higher efficiency heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas, propane, or fuel oil. Associated practices/activities: 122-AgEMP - HQ 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Rated Heat Output

Scenario Unit: 1,000 BTU/Hour

Scenario Typical Size: 750

Scenario Cost: \$6,919.04

Scenario Cost/Unit: \$9.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	16	\$499.04
Materials						
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	\$8.56	750	\$6,420.00

Practice: 374 - Farmstead Energy Improvement

Scenario: #20 - Heating - Attic Heat Recovery Vents

Scenario Description:

Install actuated inlets or automatic latching gravity inlets that draw warmer, drier air from the attic to assist with moisture and heat control when ventilation fans are being operated in poultry houses and swine barns. In certain situations it may be necessary to also upgrade the ventilation system in addition to the vent upgrades. Other systems to transfer heat, as detailed in ASABE S612-compliant energy audit may also be used. Payment includes materials and labor to install.

Before Situation:

Heated buildings with attic spaces but no means to transfer heat between the heated space, attic, and ambient (outside) air when relative conditions allow for reduced energy use.

After Situation:

Attic vents or inlets allow dry warm air from the attic to circulated through out the building in a 40' x 500' poultry house. By using pre-warmed air from the attic less energy is needed for heating 122-AgEMP - HQ 670- Lighting System Improvement, 672- Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each inlet

Scenario Unit: Each

Scenario Typical Size: 14

Scenario Cost: \$2,240.26

Scenario Cost/Unit: \$160.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	24	\$748.56
Materials						
Inlet, Attic Ceiling	2414	Poultry house attic air inlets. Includes materials only.	Each	\$106.55	14	\$1,491.70

Practice: 378 - Pond

Scenario: #1 - Embankment, Tile Conduit

Scenario Description:

A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit 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.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. 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 6" corrugated plastic tubing. 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: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,100

Scenario Cost: \$10,002.58

Scenario Cost/Unit: \$3.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	20	\$110.20
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	4	\$444.56
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$121.14	56	\$6,783.84
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	60	\$1,778.40
General Labor	231	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	\$20.81	8	\$166.48
Materials						
Pipe, HDPE, 6", CPT, Single Wall	1242	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	\$1.12	80	\$89.60
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.56	20	\$131.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30

Practice: 378 - Pond

Scenario: #2 - Embankment, 4in-6in Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit 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.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 5000 cubic yards to create an embankment. 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: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 5,000

Scenario Cost: \$20,587.97

Scenario Cost/Unit: \$4.12

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$121.14	8	\$969.12
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	20	\$110.20
Scraper, pull, 7 CY	1206	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	\$15.10	78	\$1,177.80
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$181.67	78	\$14,170.26
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	86	\$2,549.04
General Labor	231	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	\$20.81	10	\$208.10
Materials						
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.56	100	\$656.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	3	\$747.45

Practice: 378 - Pond

Scenario: #3 - Embankment, 8in-12in Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit 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.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 5000 cubic yards to create an embankment. 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: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 8,000

Scenario Cost: \$34,116.44

Scenario Cost/Unit: \$4.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Scraper, pull, 7 CY	1206	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	\$15.10	124	\$1,872.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	29	\$159.79
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	8	\$889.12
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$121.14	12	\$1,453.68
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$181.67	124	\$22,527.08
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	144	\$4,268.16
General Labor	231	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	\$20.81	16	\$332.96
Materials						
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	\$17.97	100	\$1,797.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	3	\$747.45

Practice: 378 - Pond

Scenario: #4 - Embankment, >12in Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems and other related uses. An earthen embankment will be constructed with a principle spillway conduit 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.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 11,000 cubic yards to create an embankment. 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: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 11,000

Scenario Cost: \$49,951.72

Scenario Cost/Unit: \$4.54

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Scraper, pull, 7 CY	1206	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	\$15.10	170	\$2,567.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	29	\$159.79
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$111.14	8	\$889.12
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$121.14	24	\$2,907.36
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$181.67	170	\$30,883.90
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	208	\$6,165.12
General Labor	231	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	\$20.81	30	\$624.30
Materials						
Pipe, Steel, 18", Std Wt, USED	1358	Materials: - USED - 18" - Steel Std Wt	Foot	\$37.34	120	\$4,480.80
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$28.63	16	\$458.08
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	3	\$747.45
--------------------------------	------	---	------	----------	---	----------

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #5 - 1 row windbreak, containerized tree planting stock

Scenario Description:

One row of containerized hardwood and/or conifer trees planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

A windbreak of containerized trees is installed by hand planting trees 20 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Scenario Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: \$408.10

Scenario Cost/Unit: \$0.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$11.62	1.5	\$17.43
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.115	\$50.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.115	\$49.50
Labor						
General Labor	231	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	\$20.81	1.5	\$31.22
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	1.5	\$57.98
Materials						
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.09	25	\$2.25
Fertilizer, tree, slow release, premix packet or spike	1594	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8) or Fertilizer Spike	Each	\$0.70	25	\$17.50
Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal.	1537	Potted or balled and burlapped conifer tree, 2-3 gal. Includes materials and shipping only.	Each	\$7.13	12	\$85.56
Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal.	1532	Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only.	Each	\$7.41	13	\$96.33

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #7 - 1 row windbreak, containerized shrub planting stock

Scenario Description:

One row of containerized shrubs planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

A windbreak of containerized shrubs is installed by hand planting shrubs 6 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Scenario Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: \$1,295.24

Scenario Cost/Unit: \$2.59

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$11.62	5	\$58.10
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.115	\$49.50
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.115	\$50.34
Labor						
General Labor	231	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	\$20.81	5	\$104.05
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	5	\$193.25
Materials						
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.09	84	\$7.56
Fertilizer, tree, slow release, premix packet or spike	1594	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8) or Fertilizer Spike	Each	\$0.70	84	\$58.80
Shrub, seedling or transplant, potted or B&B, 2-3 gal.	1527	Potted or balled and burlapped shrub, 2-3 gal. Includes materials and shipping only.	Each	\$9.21	84	\$773.64

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #9 - 1 row windbreak, bare-root tree seedling planting stock

Scenario Description:

One row of bare-root trees planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to machine the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

A windbreak of bare-root trees is installed by machine planting trees 10 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Scenario Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: \$196.91

Scenario Cost/Unit: \$0.39

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$6.60	0.5	\$3.30
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	0.5	\$11.43
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	0.5	\$18.11
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.115	\$49.50
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.115	\$50.34
Labor						
General Labor	231	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	\$20.81	0.5	\$10.41
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	0.5	\$19.33
Materials						
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.60	50	\$30.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.09	50	\$4.50

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #11 - 1 row windbreak, bare-root shrub seedling planting stock

Scenario Description:

One row of bare-root shrubs planted for wind protection, odor management, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. This practice is typically applied on cropland at field edges, around homesteads or around confinement facilities. Payment includes materials, labor and equipment needed to machine the stock and foregone income for land removed from crop production where windbreak is installed. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

A windbreak of bare-root shrubs is installed by machine planting shrubs 5 ft apart. Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Scenario Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: \$280.97

Scenario Cost/Unit: \$0.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	1	\$22.85
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	1	\$36.22
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$6.60	1	\$6.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.115	\$50.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.115	\$49.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	1	\$38.65
General Labor	231	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	\$20.81	1	\$20.81
Materials						
Shrub, seedling or transplant, bare root, 6-18"	1506	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.47	100	\$47.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.09	100	\$9.00

Practice: 382 - Fence

Scenario: #1 - Permanent Wildlife Exclusion

Scenario Description:

Installation of a taller than normal permanent fence to prevent conflicts between humans, livestock, and wildlife species. Such a fence would exclude wildlife from areas used by livestock.

Before Situation:

Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife poses a significant health risk to domestic animals.

After Situation:

Installation of fence reduces resource concerns associated with livestock and wildlife interaction and prevents conflicts involving threatened, endangered or sensitive species. Fence includes posts, wire, fasteners, gates, etc. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: \$9,766.22

Scenario Cost/Unit: \$7.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	1143				2	
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	21	\$171.15
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	30	\$1,086.60
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	40	\$914.00
Labor						
General Labor	231	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	\$20.81	70	\$1,456.70
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	30	\$715.80
Materials						
Gate, Game, 8' High X 16'	1086	16' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	\$416.15	1	\$416.15
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	\$26.73	76	\$2,031.48
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$14.96	8	\$119.68
Wire, Woven, Wildlife, 96"	6	High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only.	Each	\$451.18	4	\$1,804.72
Post, Steel T, 1.33 lbs, 10'	17	Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only.	Each	\$10.83	66	\$714.78
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 382 - Fence

Scenario: #2 - Permanent Barbed Wire Multi Strand

Scenario Description:

Scenario is for the establishment of permanent multi strand barbed wire fence for livestock.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for difficult sites such as poor access, steep slopes, rocky sites, dense brush, wet conditions etc.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

Associated Practices: Prescribed Grazing, Pipeline,

Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: \$2,877.94

Scenario Cost/Unit: \$2.18

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	12	\$97.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	12	\$434.64
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	12	\$274.20
Labor						
General Labor	231	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	\$20.81	24	\$499.44
Materials						
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$206.61	1	\$206.61
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	\$11.16	4	\$44.64
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	68	\$421.60
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	\$70.53	5	\$352.65
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	\$0.16	1320	\$211.20
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 382 - Fence

Scenario: #3 - Permanent High Tensile Electric 2-3 Strand

Scenario Description:

Scenario is for the installation of a permanent high tensile electric fence of either 2 or 3 strands. Fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled. Reduced vegetative cover increases opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. This scenario consists of installing a permanent high tensile electric fence with 2-3 wires with wooden post of 50' centers, battens between the post, single H brace assemblies, energizer, and all apputenances. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: \$2,058.92

Scenario Cost/Unit: \$1.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	6	\$137.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	6	\$217.32
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	6	\$48.90
Labor						
General Labor	231	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	\$20.81	12	\$249.72
Materials						
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$113.03	2	\$226.06
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$321.21	1	\$321.21
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	\$11.16	4	\$44.64
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$206.61	1	\$206.61
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.07	1320	\$92.40
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	29	\$179.80
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 382 - Fence

Scenario: #4 - Permanent High Tensile Electric Single Strand

Scenario Description:

Scenario is for the installation of a permanent high tensile electric single strand fence. Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc. Fence will be installed with wildlife friendly considerations. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: \$1,315.76

Scenario Cost/Unit: \$1.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	3	\$68.55
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	3	\$24.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	3	\$108.66
Labor						
General Labor	231	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	\$20.81	6	\$124.86
Materials						
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$321.21	1	\$321.21
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$113.03	1	\$113.03
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	24	\$148.80
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	\$11.16	4	\$44.64
Fence, Wire Assembly, High Tensile, Electric, 1 Strand	32	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.02	1320	\$26.40
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 382 - Fence

Scenario: #5 - Permanent High Tensile, Minimum 4 Strand, Posts 16ft Centers, Double H

Scenario Description:

Establishment of permanent electric or non-electric high tensile fence for livestock. Fence is designed using minimum of 4 strands with posts on 16 foot centers using double H bracing.

Before Situation:

This practice will be installed on grazing land. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health.

After Situation:

This scenario consists of installing a permanent high tensile fence with with a minimum of 4 wires with wooden posts on 16' centers, double H brace assemblies and all appurtenances. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Scenario Feature Measure: Length of fence

Scenario Unit: Foot

Scenario Typical Size: 1,320

Scenario Cost: \$3,135.25

Scenario Cost/Unit: \$2.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	15	\$122.25
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	15	\$342.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	10	\$362.20
Labor						
General Labor	231	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	\$20.81	25	\$520.25
Materials						
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$206.61	1	\$206.61
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	\$11.16	6	\$66.96
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$321.21	1	\$321.21
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	87	\$539.40
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.07	1320	\$92.40
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$113.03	2	\$226.06
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 382 - Fence

Scenario: #6 - Permanent High Tensile, Minimum 4 Strand, Posts 20ft Centers, Single H

Scenario Description:

Establishment of permanent electric or non-electric high tensile fence for livestock. Fence is designed using minimum of 4 strands with posts on 20 foot centers using single H bracing. Also used for small ruminant High Tensile electrified woven wire fence product.

Before Situation:

This practice will be installed on grazing land. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health.

After Situation:

Typical size for this scenario is 1320 feet. This scenario consists of installing a permanent high tensile fence with with a minimum of 4 wires with wooden posts on 20' centers and battens between the posts, single H brace assemblies and all appurtenances. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320

Scenario Cost: \$2,183.24

Scenario Cost/Unit: \$1.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	1142				4	
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	8	\$65.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	8	\$289.76
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	8	\$182.80
Labor						
General Labor	231	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	\$20.81	16	\$332.96
Materials						
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.07	1320	\$92.40
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$321.21	1	\$321.21
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$206.61	1	\$206.61
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	68	\$421.60
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$113.03	2	\$226.06
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	\$11.16	4	\$44.64

Practice: 382 - Fence

Scenario: #7 - Permanent Woven Wire

Scenario Description:

Establishment of woven wire fence for livestock.

Before Situation:

This practice will be installed on grazing land. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health.

After Situation:

Typical size for this scenario is 1320 feet. This scenario consists of installing a permanent woven wire fence with wooden posts of 20' centers and single H brace assemblies. Also includes one strand barbed top wire, and all appurtenances. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320

Scenario Cost: \$3,401.78

Scenario Cost/Unit: \$2.58

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	12	\$274.20
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	12	\$97.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	8	\$289.76
Labor						
General Labor	231	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	\$20.81	24	\$499.44
Materials						
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	\$11.16	6	\$66.96
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	65	\$403.00
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$206.61	1	\$206.61
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	\$249.98	4	\$999.92
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	\$70.53	1	\$70.53
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	\$0.12	1320	\$158.40
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 382 - Fence

Scenario: #9 - Safety

Scenario Description:

A barrier (fence) implemented on an NRCS constructed waste storage system according to engineering design to exclude human access. Permanently installed fence built to (1) keep humans away from waste ponds & lagoons, or (2) to protect sensitive areas (riparian areas, wetlands, springs, etc.) from heavy livestock pressure. Heavy grade fence materials and close post spacing required.

Before Situation:

Where a NRCS designed and constructed waste storage pond is planned whereby significant risk to human safety is determined to be evident. Livestock has access to sensitive areas that may cause detrimental effect to animal/human health and wildlife habitat. Resource concerns affected are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment or water quality due to turbidity..

After Situation:

Humans and livestock are excluded from the waste storage pond for safety purposes by installing a fence around a waste holding pond. The fence would typically be 100 wide x 175 long with one gate and installed by a fencing contractor. Woven wire fence with one strand of barb wire on top with a gate. Improved livestock control and access to water or other sensitive areas will promote safety for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 450

Scenario Cost: \$2,424.29

Scenario Cost/Unit: \$5.39

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.15	5	\$40.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	5	\$181.10
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	5	\$114.25
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	12	\$286.32
General Labor	231	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	\$20.81	15	\$312.15
Materials						
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$206.61	1	\$206.61
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.20	8	\$49.60
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	\$70.53	1	\$70.53
Wire, Woven, Galvanized, 12.5 Gauge, 32"	3	Galvanized 12.5 gauge, 32" - 330' roll. Includes materials and shipping only.	Each	\$174.34	2	\$348.68
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$14.96	13	\$194.48
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	\$6.62	43	\$284.66
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	2	\$335.16

Practice: 386 - Field Border

Scenario: #1 - Introduced Grass

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of introduced species (scenario includes non-native grass/legume species) and the area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$531.25

Scenario Cost/Unit: \$531.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	1	\$5.66
Foregone Income						
Fl, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	\$41.38	-2	(\$82.76)
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	1	\$15.63
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	40	\$20.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	50	\$32.00
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.62	50	\$31.00
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65

Practice: 386 - Field Border

Scenario: #2 - Native Grass

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species (scenario includes native grass/legume/forbs species) and the area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$717.35

Scenario Cost/Unit: \$717.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	2	\$11.32
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	1	\$220.98
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	2	\$31.26

Practice: 386 - Field Border

Scenario: #3 - Organic Introduced Grass

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of introduced species (scenario includes non-native grass/legume species) and the area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$564.43

Scenario Cost/Unit: \$564.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Foregone Income						
Fl, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	0.5	\$252.22
Fl, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	0.5	\$249.26
Fl, Hay, General Grass, Organic	2200	Organic general Grass Hay is Primary Land Use	Ton	\$47.59	-2	(\$95.18)
Materials						
Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.30	40	\$12.00
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.30	50	\$15.00
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.30	50	\$15.00

Practice: 386 - Field Border

Scenario: #4 - Organic Native Grass

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species (scenario includes native grass/legume/forbs species) and the area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$762.69

Scenario Cost/Unit: \$762.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Foregone Income						
FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	0.5	\$252.22
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	0.5	\$249.26
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	1	\$220.98

Practice: 386 - Field Border

Scenario: #5 - Pollinator Habitat

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field including mix of grasses, legumes and/or forbs that provides a mix of early, mid, and late season blooming forbs for pollinator habitat. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$757.66

Scenario Cost/Unit: \$757.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	2	\$11.32
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	2	\$31.26
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	\$261.29	1	\$261.29

Practice: 386 - Field Border

Scenario: #6 - Organic Pollinator Habitat

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field including mix of grasses, legumes and/or forbs that provides a mix of early, mid, and late season blooming forbs for pollinator habitat. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$803.00

Scenario Cost/Unit: \$803.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Foregone Income						
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	0.5	\$249.26
FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	0.5	\$252.22
Materials						
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	\$261.29	1	\$261.29

Practice: 390 - Riparian Herbaceous Cover

Scenario: #3 - Native Grass

Scenario Description:

This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Native Grass is established by seeding. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Payment includes seedbed preparation, seed, and planting, and foregone income for land removed from production.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Scenario Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$714.23

Scenario Cost/Unit: \$714.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	1	\$5.66
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Materials						
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$94.57	1	\$94.57
Three Species Mix, Cool Season, Native Perennial Grass	2316	Cool season, native grass mix. Includes material and shipping only.	Acre	\$144.58	1	\$144.58
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	1	\$15.63

Practice: 390 - Riparian Herbaceous Cover

Scenario: #4 - Pollinator

Scenario Description:

This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Pollinator habitat is established by seeding. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Payment includes seedbed preparation, seed, and planting, and foregone income for land removed from production.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Scenario Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$661.26

Scenario Cost/Unit: \$661.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	1	\$5.66
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	1	\$15.63
One Species, Native Forb, Low Cost	2329	Native forb. Includes material and shipping only.	Acre	\$186.18	1	\$186.18

Practice: 390 - Riparian Herbaceous Cover

Scenario: #2 - Prairie Cordgrass Restoration

Scenario Description:

This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Prairie cordgrass (*Spartina pectinata*) is planted using plugs. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Payment includes seedbed preparation cordgrass plugs and planting, and foregone income for land removed from production.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Scenario Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$1,102.03

Scenario Cost/Unit: \$1,102.03

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Labor						
General Labor	231	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	\$20.81	8	\$166.48
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	0.5	\$11.93
Materials						
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	\$1.37	220	\$301.40

Mobilization

Mobilization

Mobilization, small equipment	1138	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	\$167.58	1	\$167.58
-------------------------------	------	--	------	----------	---	----------

Practice: 391 - Riparian Forest Buffer

Scenario: #1 - Direct Seeding

Scenario Description:

Establish a buffer of trees and/or shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of trees or shrubs planted through direct seeding. Planting rate will be approximately 3000 seed per acre. Payment includes tree seed, equipment and labor to seed, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Scenario Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: \$4,108.21

Scenario Cost/Unit: \$821.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	8	\$182.80
Mechanical nut planter	1601	Mechanical nut planter for direct seeding of trees and shrubs. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$1.93	8	\$15.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	8	\$289.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	2.5	\$1,094.40
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	2.5	\$1,076.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	8	\$190.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	8	\$309.20
Materials						
Trees and shrubs, seed	1871	Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only.	Pound	\$4.67	150	\$700.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	1	\$249.15

Practice: 391 - Riparian Forest Buffer

Scenario: #3 - Bare-root trees, each

Scenario Description:

Establish a buffer of trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of machine planted bare-root trees at spacings recommended in a tree/shrub planting plan. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Scenario Feature Measure:

Scenario Unit: Each

Scenario Typical Size: 2,180

Scenario Cost: \$3,944.04

Scenario Cost/Unit: \$1.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	2	\$45.70
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$6.60	2	\$13.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	2.5	\$1,076.08
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	2.5	\$1,094.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	2	\$77.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	2	\$47.72
General Labor	231	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	\$20.81	2	\$41.62
Materials						
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.60	2180	\$1,308.00
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 391 - Riparian Forest Buffer

Scenario: #4 - Bare-root shrubs, each

Scenario Description:

Establish a buffer of shrubs, in conjunction with planted or existing trees, into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of machine planted bare-root shrubs at spacings recommended in a tree/shrub planting plan. Payment includes shrubs, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Each

Scenario Typical Size: 1,210

Scenario Cost: \$1,601.46

Scenario Cost/Unit: \$1.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$22.85	2	\$45.70
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$6.60	2	\$13.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$36.22	2	\$72.44
Foregone Income						
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.86	2	\$47.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	2	\$77.30
General Labor	231	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	\$20.81	2	\$41.62
Materials						
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.58	1210	\$701.80
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 391 - Riparian Forest Buffer

Scenario: #5 - Container Trees and Shrubs (3 gallon), Each

Scenario Description:

Establish a buffer of trees and shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of hand planting containerized shrubs and trees at spacings recommended in a tree/shrub planting plan. Payment includes shrubs/trees, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Scenario Feature Measure: Area of planting

Scenario Unit: Each

Scenario Typical Size: 100

Scenario Cost: \$2,035.67

Scenario Cost/Unit: \$20.36

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$11.62	6	\$69.72
Foregone Income						
Fl, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	1	\$437.76
Fl, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	1	\$430.43
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	6	\$231.90
General Labor	231	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	\$20.81	6	\$124.86
Materials						
Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal.	1532	Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only.	Each	\$7.41	100	\$741.00

Practice: 393 - Filter Strip

Scenario: #1 - Native species, No Fertility Required

Scenario Description:

A strip or area of native herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Current soil test indicates that fertility is not necessary for vegetation establishment. Practice includes seedbed prep, planting of native species and foregone income for land removed from production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$590.94

Scenario Cost/Unit: \$590.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	2	\$11.32
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	2	\$31.26
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$94.57	1	\$94.57

Practice: 393 - Filter Strip

Scenario: #2 - Native species with Fertility

Scenario Description:

A strip or area of native herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep, planting of native species, fertilizer and foregone income for land remove from production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, fertility, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$654.22

Scenario Cost/Unit: \$654.22

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	2	\$11.32
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	50	\$32.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	2	\$31.26
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	50	\$25.00
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$94.57	1	\$94.57

Practice: 393 - Filter Strip

Scenario: #5 - Introduced species, No Fertility Required

Scenario Description:

A strip or area of introduced herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Current soil test indicates that fertility is not necessary for vegetation establishment. Practice includes seedbed prep planting of introduced species and foregone income for land removed from production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$524.73

Scenario Cost/Unit: \$524.73

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	1	\$5.66
Foregone Income						
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	1	\$15.63

Practice: 393 - Filter Strip

Scenario: #6 - Introduced species, with Fertility:

Scenario Description:

A strip or area of herbaceous vegetation, introduced species, situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep, planting of introduced species, fertility and foregone income for land removed from production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, fertility, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$619.01

Scenario Cost/Unit: \$619.01

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	1	\$5.66
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.62	50	\$31.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	50	\$32.00
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	50	\$25.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	1	\$15.63

Practice: 393 - Filter Strip

Scenario: #7 - Introduced species, No Fertility Required - Organic

Scenario Description:

A strip or area of introduced herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Current soil test indicates that fertility is not necessary for vegetation establishment. Practice includes seedbed prep, planting of introduced species and foregone income for land removed from production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$601.06

Scenario Cost/Unit: \$601.06

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	1	\$10.27
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Foregone Income						
FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	0.5	\$252.22
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	0.5	\$249.26
Materials						
Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62

Practice: 393 - Filter Strip

Scenario: #8 - Introduced Species, with Fertility - Organic

Scenario Description:

A strip or area of herbaceous vegetation, introduced species, situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep, land shaping and planting of approved species. Planting of introduced species, fertility and foregone income for land removed from production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, fertility, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$662.61

Scenario Cost/Unit: \$662.61

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1	\$6.28
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Foregone Income						
Fl, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$504.44	0.5	\$252.22
Fl, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$498.52	0.5	\$249.26
Materials						
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.30	50	\$15.00
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.30	50	\$15.00
Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.30	50	\$15.00

Practice: 393 - Filter Strip

Scenario: #9 - Filter Strip, Muck Soils

Scenario Description:

A strip or area of native herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep and planting of native species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Scenario Feature Measure: Number of Acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: \$588.59

Scenario Cost/Unit: \$588.59

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1	\$19.69
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	3	\$16.98
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$437.76	0.5	\$218.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$430.43	0.5	\$215.22
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$70.93	1	\$70.93
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	3	\$46.89

Practice: 394 - Firebreak

Scenario: #1 - Constructed - Light Equipment

Scenario Description:

Installation of a bare-ground firebreak of a minimum width of 15' around a 20 acre field/farm using farm equipment (2 passes). Generally water control devices such as water bars are not needed due either to the lack of steep terrain or the temporary nature of the firebreak. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Installation will be accomplished by making two passes with the use of typical farm equipment such as tractors, plows, disks, or similar implements.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned.

Scenario Feature Measure: Length of firebreak

Scenario Unit: Foot

Scenario Typical Size: 4,000

Scenario Cost: \$218.74

Scenario Cost/Unit: \$0.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$15.31	2	\$30.62
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$10.27	2	\$20.54
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 394 - Firebreak

Scenario: #4 - Vegetated permanent firebreak

Scenario Description:

Establishing a 20 foot wide strip of permanent vegetation that will serve as a green firebreak. Scenario includes clearing the site, preparing the seedbed, seeding (typically cool season grasses and/or legumes), and applying needed soil amendments. Clearing will be achieved using chemical and/or mechanical means. Seedbed preparation and vegetation establishment will be accomplished with farm equipment. Soil amendments will be applied according to local FOTG guidance. This scenario does not include follow-up maintenance operations such as weed control, mowing, etc. Resource concerns include Wildfire hazard from excessive biomass accumulation, Soil erosion, and Excessive sediment in surface waters.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned. Wildlife habitat will also be enhanced and the potential for erosion from the firebreak is minimized.

Scenario Feature Measure: Length of firebreak

Scenario Unit: Foot

Scenario Typical Size: 3,000

Scenario Cost: \$502.07

Scenario Cost/Unit: \$0.17

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.28	1.4	\$8.79
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$5.66	1.4	\$7.92
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.69	1.4	\$27.57
Labor						
General Labor	231	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	\$20.81	4	\$83.24
Materials						
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	\$32.72	1.4	\$45.81
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$26.14	2	\$52.28
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.50	60	\$30.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.64	60	\$38.40
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.62	30	\$18.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.63	1.4	\$21.88
Mobilization						
Mobilization, small equipment	1138	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	\$167.58	1	\$167.58

Practice: 396 - Aquatic Organism Passage

Scenario: #1 - Concrete Dam Removal

Scenario Description:

The full or partial removal of a concrete or earthen dam which is restricting or impeding movement of aquatic organisms to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The extent of removal (full or partial) is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect--to the fullest extent possible--pre-dam conditions. Removal is completed with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Alternative demolition techniques may include the use of high explosives, diamond-chain, or similar circular saws to remove the dam in a piecewise manner. Removed materials are trucked away and disposed or recycled off-site. Associated practices for practice installation include: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment, (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control, and (578) Stream Crossing.

Before Situation:

A channel-spanning concrete dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish. Resource concerns include habitat degradation; Ponding, flooding, seasonal high water table, seeps, drifted snow, and Elevated water temperature.

After Situation:

A 7 foot tall, 85 foot long low head concrete dam is demolished and debris is removed. The geometry and slope of the reach impacted by removal of the dam are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Linear Feet of Low Head Dam and Abutments

Scenario Unit: Linear Foot

Scenario Typical Size: 85

Scenario Cost: \$38,711.51

Scenario Cost/Unit: \$455.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	\$167.71	4	\$670.84
Hauling, bulk, highway truck	1615	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	\$0.32	9200	\$2,944.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$42.05	60	\$2,523.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$185.79	60	\$11,147.40
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$121.14	20	\$2,422.80
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	\$299.51	1.5	\$449.27
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	\$94.35	80	\$7,548.00

Labor

Labor

General Labor	231	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	\$20.81	60	\$1,248.60
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	80	\$2,495.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	160	\$4,742.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$38.65	40	\$1,546.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.15	2	\$498.30
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70

Practice: 396 - Aquatic Organism Passage

Scenario: #2 - Culvert Replacement

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used where a field access road intersects with a stream crossing. The aquatic organism passage (AOP) will provide and promote stream ecological and geomorphic function. CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. Any associated road surface reinstallation is not included as part of this practice. If the reinstallation of a field access lane is needed, consider the planning and application of the associated road surface reinstallation through (560) Access Road. Other associated practices include, but is not limited to (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection.

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to deposition of sediment upstream of the road crossing, or has been designed for typical stormwater capacity, but is inadequate for proper aquatic organism passage. An undersized culvert is causing the associated road to be overtopped by high flows, resulting in outright failure and landowner accessibility problems. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and sediment deposition. An inadequately sized culvert results in native aquatic organisms being unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel. Resource concerns addressed include: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference upstream reach of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to transport the streamflow, the culvert requires decreased maintenance activities over time. Landowners are able to access their property across a range of flows, and are able to seek and receive emergency and post-flood recovery services.

Scenario Feature Measure: CMP

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$4,663.02

Scenario Cost/Unit: \$4,663.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$185.79	6	\$1,114.74
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.51	96	\$528.96
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.19	4	\$124.76
General Labor	231	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	\$20.81	6	\$124.86
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.64	6	\$177.84
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	\$24.34	4	\$97.36

Materials

Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	\$0.75	2600	\$1,950.00
---------------------------------------	------	--	-------	--------	------	------------

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$475.70	1	\$475.70
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$68.80	1	\$68.80