**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #50 - Non-Dairy Operation Less Than 300 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a small sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the small-sized non-dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,087.02

**Scenario Cost/Unit:** $9,087.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 55 | $5,696.90 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 43 | $3,390.12 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #51 - Dairy Operation Less Than 300 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) and CNMP Case File will be developed to address resource concerns on a small Dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a small sized dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the small-sized dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $11,395.14

**Scenario Cost/Unit:** $11,395.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 75 | $7,768.50 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 46 | $3,626.64 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #52 - Non-Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium non-dairy Animal Feeding Operation (AFO) currently greater than or equal to 300 and less than 700 animal units (AU).--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a medium sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS with the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the non-dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $11,715.12

**Scenario Cost/Unit:** $11,715.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 72 | $7,457.76 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 54 | $4,257.36 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #53 - Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium Dairy Animal Feeding Operation (AFO) currently greater than or equal to 300 and less than 700 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a medium sized Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $12,987.44

**Scenario Cost/Unit:** $12,987.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 82 | $8,493.56 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 57 | $4,493.88 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #54 - Non-Dairy Operation Greater Than or Equal to 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large non-dairy Animal Feeding Operation ((AFO) currently greater than or equal to 700 animal units (AU)--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a large sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the non-dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $14,160.80

**Scenario Cost/Unit:** $14,160.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 88 | $9,115.04 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 64 | $5,045.76 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #55 - Dairy Operation Greater Than or Equal to 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large Dairy Animal Feeding Operation (AFO) currently greater than or equal to 700 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a large sized Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $14,422.06

**Scenario Cost/Unit:** $14,422.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 89 | $9,218.62 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 66 | $5,203.44 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #56 - Livestock Operation Less Than 300 AU without Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a small AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP- related practices for the AFO has potentially occurred. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Decisions selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist..

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,334.24

**Scenario Cost/Unit:** $8,334.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 66 | $6,836.28 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 19 | $1,497.96 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #57 - Livestock Operation Greater Than 300 AU without Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium-large Animal Feeding Operation (AFO) currently greater than or equal to 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a medium-large sized AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS a the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $10,381.10

**Scenario Cost/Unit:** $10,381.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 85 | $8,804.30 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 20 | $1,576.80 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #135 - CNMP Less Than or Equal to 300 AU with Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. This scenario is for sites or states where the services of a professional engineer are minimal. The producer may export modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan includes all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas result in meeting NRCS planning criteria for water quality, soil erosion, and air quality concerns. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of an AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. Partial implementation of conservation practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS with the CNMP Case File data that describes management and conservation practice systems to address all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to address soil erosion, water quality, and air quality within the NRCS planning criteria. Accurate record keeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,977.80

**Scenario Cost/Unit:** $4,977.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 10 | $1,035.80 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 50 | $3,942.00 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #136 - CNMP Less Than or Equal to 300 AU without Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on the Animal Feeding Operation (AFO) currently less than 300 or equal animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer exports nearly all of the manure or organic products from the farm. The CNMP is a conservation plan that addresses soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing soil erosion, water quality, and air quality resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of the AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and record keeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and record keeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File that describes management and conservation practice(s) to address all identified soil erosion, water quality, and air quality resource concerns on the AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate record keeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,006.80

**Scenario Cost/Unit:** $3,006.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 10 | $1,035.80 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 25 | $1,971.00 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #137 - CNMP Greater Than 300 AU with Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on an Animal Feeding Operation (AFO) currently greater than or equal to 300 animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer may export modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most manure nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of an AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and record keeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File data that describes management and conservation practices to address all identified soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate record keeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,678.30

**Scenario Cost/Unit:** $6,678.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 15 | $1,553.70 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 65 | $5,124.60 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #138 - CNMP Greater Than 300 AU without Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on an Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer exports nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses the soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of an AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses the soil erosion, water quality, and air quality resource concerns present on the facility production areas and any applicable land application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, soil erosion, water quality, and air quality concerns from feeding and lounging areas, and record keeping documentation of manure generation and exports. Negative air quality impacts may remain on the AFO, and record keeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems are inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize soil erosion, water quality, and air quality concerns from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts. Practices selected in the Record of Decisions will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate record keeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,401.00

**Scenario Cost/Unit:** $3,401.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 10 | $1,035.80 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 30 | $2,365.20 |

**Practice:** 102 - Comprehensive Nutrient Management Plan - Written

**Scenario:** #141 - CNMP Revision

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be revised to address changes in manure management, volume or analysis, plants and crops, or plant and crop management or to adjust the nutrient balance on an Animal Feeding Operation (AFO). No modifications are required to engineered practices in the farmstead/production area. This scenario is where the services of a professional engineer are typically not required. The producer may export manure or organic products from the farm. The producer has an animal production area and land applies nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan may include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. All production area components are considered adequate. Land application components of the plan includes all lands under the control of the AFO owner or operator where nutrients are being applied. Planned practices on the land application area result in meeting NRCS planning criteria for water quality, soil erosion, and air quality concerns. Any applicable air emission and negative air quality impacts occurring because of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives. CNMP Revision CAP may not be used more often that once every five years, although it is recognized the nutrient management plan may be updated more frequently based on soil test frequency or other factors.

**Before Situation:**

The owner/operator of an AFO has an existing written Comprehensive Nutrient Management Plan (CNMP) that addresses the current required resource concerns and client objectives present on the facility production area and land application areas. The CNMP is out of date or does not meet current needs or objectives. Various levels of management and conservation implementation have changed on the operation. Soil tests, manure analyses, or changes in cropping system require that the nutrient balance be adjusted to bring the CNMP up to date.

**After Situation:**

A certified Technical Services Provider (TSP) has developed a comprehensive nutrient management plan meeting CNMP CAP criteria (GM – Part 405 - Comprehensive Nutrient Management Plans) for the AFO owner/operator and has delivered to NRCS the CNMP with the CNMP Case File data that describes management and conservation practice systems to address all identified required resource concerns on the AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will operate properly, within applicable NRCS standards and specifications, to store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to address soil erosion, water quality, and air quality within the NRCS planning criteria. Required record keeping for land treatment, nutrient management, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are identified in the CNMP.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,671.50

**Scenario Cost/Unit:** $3,671.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 5 | $517.90 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 40 | $3,153.60 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario:** #32 - Nutrient Management CAP Less Than or Equal to 100 Acres (Not part of a CNMP)

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in CAP 104 and 590 Nutrient Management. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,408.70

**Scenario Cost/Unit:** $2,408.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 30 | $2,408.70 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario:** #33 - Nutrient Management CAP 101-300 Acres (Not part of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for application and management of land applied nutrients. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, increase nutrient use efficiency and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet Nutrient Management criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,211.60

**Scenario Cost/Unit:** $3,211.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 40 | $3,211.60 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario:** #34 - Nutrient Management CAP Greater Than 300 Acres (Not part of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of land applied nutrients. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, increase profit margins, reduce costs, improve nutrient use efficiency, and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,014.50

**Scenario Cost/Unit:** $4,014.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 50 | $4,014.50 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario:** #35 - Nutrient Management CAP Less Than or Equal to 100 Acres (Element of a CNMP)

**Scenario Description:**

Various on-farm land uses where natural or artificial nutrient amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients applied to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet nutrient criteria for the primary Water Quality resource concern in 590 and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,014.50

**Scenario Cost/Unit:** $4,014.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 50 | $4,014.50 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario:** #36 - Nutrient Management CAP 101-300 Acres (Element of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for application and management of applied nutrients to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet 590 criteria for the primary Water Quality resource concern and other applicable resource concerns, and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,620.30

**Scenario Cost/Unit:** $5,620.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 70 | $5,620.30 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario:** #37 - Nutrient Management CAP Greater Than 300 Acres (Element of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients applied to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet 590 criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,824.65

**Scenario Cost/Unit:** $6,824.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 85 | $6,824.65 |

**Practice:** 106 - Forest Management Plan - Written

**Scenario:** #38 - FMP Less Than or Equal to 20 acres

**Scenario Description:**

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,448.94

**Scenario Cost/Unit:** $1,448.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 19 | $1,448.94 |

**Practice:** 106 - Forest Management Plan - Written

**Scenario:** #39 - FMP 21 to 100 acres

**Scenario Description:**

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,830.24

**Scenario Cost/Unit:** $1,830.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 24 | $1,830.24 |

**Practice:** 106 - Forest Management Plan - Written

**Scenario:** #40 - FMP 101 to 250 acres

**Scenario Description:**

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,279.18

**Scenario Cost/Unit:** $3,279.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 43 | $3,279.18 |

**Practice:** 106 - Forest Management Plan - Written

**Scenario:** #41 - FMP Greater Than 1000 acres

**Scenario Description:**

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,863.40

**Scenario Cost/Unit:** $6,863.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 90 | $6,863.40 |

**Practice:** 106 - Forest Management Plan - Written

**Scenario:** #42 - FMP 251 to 500 acres

**Scenario Description:**

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,728.12

**Scenario Cost/Unit:** $4,728.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 62 | $4,728.12 |

**Practice:** 106 - Forest Management Plan - Written

**Scenario:** #43 - FMP 501 to 1000 acres

**Scenario Description:**

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,490.72

**Scenario Cost/Unit:** $5,490.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 72 | $5,490.72 |

**Practice:** 108 - Feed Management Plan - Written

**Scenario:** #37 - Feed Management Plan

**Scenario Description:**

The owner/operator of an Animal Feeding Operation (AFO) has not received a written Feed Management Plan (FeedMP) that addresses all resource concerns present on the facility. Various levels of management and conservation implementation has occurred in the operation. Little documentation of the methods of feed management used and practices installed exists, and the producer is not likely to developed a complete forage inventory or nutrient analysis. The producer may or may not have a conservation plan or a nutrient management plan. Nutrient management related resource concerns on the operation remain to be addressed through the development of a complete FeedMP including management and conservation practices for proper quantity and quality of available nutrients, feedstuffs, and/or additives fed to livestock or poultry that may be present on the operation. Present operation and feed methodology poses risk of feeding excessive amounts of nutrients in animal manure which result in negative impacts to water quality and odor resource concerns. Negative water and air quality impacts as well as farmstead safety and security issues may remain on the AFO, and inadequate recordkeeping nutrient, inspection and monitoring of the existing operation may need further improvement.

**Before Situation:**

Producer has no plan or limited knowledge of management of feed, nutrients, feedstuffs, or nutritional additives provided to domestic livestock and poultry. The producer currently manages feed without a plan which would address livestock production limitations and water and air quality resource concern impacts. Producer currently lacks plan to provide proper balance of forage, grains or other feeds and supplements to assure domestic animal nutritional needs are met without negatively impacting water and air quality. Producer is interested in management of feed for domestic animals to maximize profit margin, reduce costs, improve or address livestock production opportunities, and for other environmental benefits. Producer is willing to collaborate with a certified Technical Service Provider (TSP) to develop a plan, and to collect/coordinate data and records to determine current nutritional needs. Associated Practice(s): 590-Nutrient Management

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Feed Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable natural resource concerns and provides for opportunities to identify and implement conservation practices related to management of feed, forages, or delivery of supplements to maximize efficient feeding operations and livestock growth. The CAP plan may serve as the basis for implementation of the primary conservation practice 592 - Feed Management. If applicable, the CAP may also be developed to complement Comprehensive Nutrient Management Plans (CNMP) or to help meet requirements of NRCS practice standard 590 - Nutrient Management. As addressed in the CAP planning criteria, the plan may include recommendations for addressing associated natural resource concerns with other conservation practices. The Feed Management CAP meets the basic quality criteria for the 108 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,153.60

**Scenario Cost/Unit:** $3,153.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 40 | $3,153.60 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario:** #1 - Grazing Management Plan Less Than or Equal to 100 acres

**Scenario Description:**

Small agricultural operation with less than 100 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,350.80

**Scenario Cost/Unit:** $2,350.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $78.36 | 30 | $2,350.80 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario:** #2 - Grazing Management Plan 101 to 500 acres

**Scenario Description:**

Small agricultural operation with 101 to 500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,134.40

**Scenario Cost/Unit:** $3,134.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $78.36 | 40 | $3,134.40 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario:** #3 - Grazing Management Plan 1501 to 5000 acres

**Scenario Description:**

Small agricultural operation with 1501 to 5000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,701.60

**Scenario Cost/Unit:** $4,701.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $78.36 | 60 | $4,701.60 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario:** #5 - Grazing Management Plan Greater Than 5000 acres

**Scenario Description:**

Small agricultural operation with more than 5000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,485.20

**Scenario Cost/Unit:** $5,485.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $78.36 | 70 | $5,485.20 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario:** #66 - Grazing Management Plan 501 to 1500 acres

**Scenario Description:**

Small agricultural operation with 501 to 1500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number of plans

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,918.00

**Scenario Cost/Unit:** $3,918.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $78.36 | 50 | $3,918.00 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario:** #38 - Prescribed Burning Plan Less Than or Equal to 20 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically less than or equal to 20 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $381.30

**Scenario Cost/Unit:** $381.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 5 | $381.30 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario:** #39 - Prescribed Burning Plan 21-100 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 21 to 100 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $610.08

**Scenario Cost/Unit:** $610.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 8 | $610.08 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario:** #40 - Prescribed Burning Plan 101-250 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 101 to 250 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $915.12

**Scenario Cost/Unit:** $915.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 12 | $915.12 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario:** #41 - Prescribed Burning Plan 251-500 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 251 to 500 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,220.16

**Scenario Cost/Unit:** $1,220.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 16 | $1,220.16 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario:** #42 - Prescribed Burning Plan 501-1000 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 501 to 1000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,525.20

**Scenario Cost/Unit:** $1,525.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 20 | $1,525.20 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario:** #43 - Prescribed Burning Plan Greater Than 1000 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 1000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,830.24

**Scenario Cost/Unit:** $1,830.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 24 | $1,830.24 |

**Practice:** 114 - Integrated Pest Management Plan - Written

**Scenario:** #14 - IPM Management CAP Small-Specialty Less Than 50 Acres

**Scenario Description:**

Various on-farm land uses where pests are managed on smaller operations, including organic and specialty crop operations, where more complicated pest management evaluations and solutions may be necessary. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of the control or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in the management of pests and the reduction of environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Integrated Pest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,007.25

**Scenario Cost/Unit:** $2,007.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 25 | $2,007.25 |

**Practice:** 114 - Integrated Pest Management Plan - Written

**Scenario:** #15 - IPM Management CAP Medium 51 - 250 Acres

**Scenario Description:**

Various on-farm land uses where pests are managed on a moderately-sized farm where IPM is to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of the control or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in the management of pests and the reduction of environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Integrated Pest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,569.28

**Scenario Cost/Unit:** $2,569.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 32 | $2,569.28 |

**Practice:** 114 - Integrated Pest Management Plan - Written

**Scenario:** #16 - IPM Management CAP Large - Greater Than 250 Acres

**Scenario Description:**

Various on-farm land uses where pests are managed on a larger farm where IPM strategies are to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of the control or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in the management of pests and the reduction of environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Integrated Pest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,014.50

**Scenario Cost/Unit:** $4,014.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 50 | $4,014.50 |

**Practice:** 116 - Soil Health Management Plan - Written

**Scenario:** #3 - Small Farm

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production on smaller diversified farms (<10 acres).. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,408.70

**Scenario Cost/Unit:** $2,408.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 30 | $2,408.70 |

**Practice:** 116 - Soil Health Management Plan - Written

**Scenario:** #19 - Crops and Livestock

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop, forage and livestock production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,014.50

**Scenario Cost/Unit:** $4,014.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 50 | $4,014.50 |

**Practice:** 116 - Soil Health Management Plan - Written

**Scenario:** #35 - Organic Crops and Livestock

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop, forage and livestock production on organic or transitioning to organic operations. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,415.95

**Scenario Cost/Unit:** $4,415.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 55 | $4,415.95 |

**Practice:** 116 - Soil Health Management Plan - Written

**Scenario:** #51 - Organic Crops

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production on organic or transitioning to organic operations. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,613.05

**Scenario Cost/Unit:** $3,613.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 45 | $3,613.05 |

**Practice:** 116 - Soil Health Management Plan - Written

**Scenario:** #67 - Crops

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,211.60

**Scenario Cost/Unit:** $3,211.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 40 | $3,211.60 |

**Practice:** 118 - Irrigation Water Management Plan - Written

**Scenario:** #6 - Irrigation Water Management Conservation Activity Plan CAP

**Scenario Description:**

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. Producer is interested in management of irrigation water to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Irrigation Water Management Conservation Activity Plan (CAP) to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,625.30

**Scenario Cost/Unit:** $3,625.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 35 | $3,625.30 |

**Practice:** 118 - Irrigation Water Management Plan - Written

**Scenario:** #17 - Irrigation Water Management CAP with Pump Test

**Scenario Description:**

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. The pump for the irrigation system is of unknown performance and older than 3 years. Producer is interested in management of irrigation water to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Irrigation Water Management Conservation Activity Plan (CAP) to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. Because a pump test was performed, a new pump that operates more efficiently and matches the irrigation system has been analyzed and could possibly be installed such that less water and energy are consumed. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Acre

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,696.90

**Scenario Cost/Unit:** $5,696.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 55 | $5,696.90 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #39 - AgEMP Small, One Enterprise

**Scenario Description:**

Typical operation has either < 300 acres, < 300 AU, up to 2 irrigation pumps, < 20,000 sq. ft. of heater greenhouse, or a maple syrup enterprise. One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard. A small operation is as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages a small operation as described above. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,404.16

**Scenario Cost/Unit:** $2,404.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 9 | $932.22 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 17 | $767.04 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 1.5 | $44.66 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 12 | $660.24 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #41 - AgEMP Medium, One Enterprise

**Scenario Description:**

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource concern: Energy Conservation

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a medium small operation with enterprise described above. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,994.98

**Scenario Cost/Unit:** $2,994.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 12 | $1,242.96 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 18 | $812.16 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 2 | $59.54 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 16 | $880.32 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #43 - AgEMP Large, One Enterprise

**Scenario Description:**

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation with one enterprise, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages a large operation with enterprises as described above. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,935.21

**Scenario Cost/Unit:** $3,935.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 19 | $1,968.02 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 20 | $902.40 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 2.5 | $74.43 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 18 | $990.36 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #44 - AgEMP Small, Two Enterprise

**Scenario Description:**

Typical operation has either <300 acres, < 300 AU, up to 2 irrigation pumps, or < 20,000 sq. ft. heated greenhouse. Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard. A small operation as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type small sized operation with two enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,731.07

**Scenario Cost/Unit:** $3,731.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 15 | $1,553.70 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 21 | $947.52 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 2.5 | $74.43 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 21 | $1,155.42 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #45 - AgEMP Medium Two Enterprises

**Scenario Description:**

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource concern: Energy Conservation

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any operation with two enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,057.98

**Scenario Cost/Unit:** $5,057.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 21 | $2,175.18 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 25 | $1,128.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 3.5 | $104.20 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 30 | $1,650.60 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #46 - AgEMP Large, Two Enterprises

**Scenario Description:**

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of the extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. the producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource concern: Energy Conservation

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any operation with two enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,902.79

**Scenario Cost/Unit:** $6,902.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 32 | $3,314.56 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 29 | $1,308.48 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 4.5 | $133.97 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 39 | $2,145.78 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #47 - AgEMP Small, Three Enterprise

**Scenario Description:**

Typical operation has either < 300 acres, < 300 AU, up to 2 irrigation pumps, or < 20,000 sq. ft. of heater greenhouse. Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a small operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of operation with three enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,321.89

**Scenario Cost/Unit:** $4,321.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 18 | $1,864.44 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 22 | $992.64 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 3 | $89.31 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 25 | $1,375.50 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #48 - AgEMP Medium, Three Enterprise

**Scenario Description:**

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of operation with three enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,648.80

**Scenario Cost/Unit:** $5,648.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 24 | $2,485.92 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 26 | $1,173.12 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 4 | $119.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 34 | $1,870.68 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #49 - AgEMP Large, Three Enterprise

**Scenario Description:**

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of the extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type operation with three enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,597.19

**Scenario Cost/Unit:** $7,597.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 36 | $3,728.88 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 30 | $1,353.60 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 5 | $148.85 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 43 | $2,365.86 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #50 - AgEMP Small, Four Enterprises

**Scenario Description:**

Typical operation has either < 300 acres, < 300 AU, up to 2 irrigation pumps, or < 20,000 sq. ft. of heater greenhouse. Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a small operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any operation with four enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). the producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,262.12

**Scenario Cost/Unit:** $5,262.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 25 | $2,589.50 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 24 | $1,082.88 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 3.5 | $104.20 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 27 | $1,485.54 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #51 - AgEMP 128 Medium, Four Enterprise

**Scenario Description:**

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with an medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of operation with four or more enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,589.03

**Scenario Cost/Unit:** $6,589.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 31 | $3,210.98 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 28 | $1,263.36 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 4.5 | $133.97 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 36 | $1,980.72 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario:** #52 - AgEMP 128 Large, Four Enterprise

**Scenario Description:**

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large livestock operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of the extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,641.00

**Scenario Cost/Unit:** $8,641.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 44 | $4,557.52 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 32 | $1,443.84 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 5.5 | $163.74 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 45 | $2,475.90 |

**Practice:** 130 - Drainage Water Management Plan - Written

**Scenario:** #9 - DWMP - Tile Map Available

**Scenario Description:**

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system where a map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

**Before Situation:**

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of controlling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

**After Situation:**

A certified Technical Service Provider (TSP) develops the Drainage Water Management Conservation Activity Plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,827.56

**Scenario Cost/Unit:** $2,827.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $112.21 | 8 | $897.68 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 13 | $1,024.92 |
| Cap Labor, Survey and Mapping Technician | 1591 | 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. May verify accuracy and completeness of maps. | Hours | $56.56 | 16 | $904.96 |

**Practice:** 130 - Drainage Water Management Plan - Written

**Scenario:** #10 - DWMP - No Tile Map Available

**Scenario Description:**

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system where no map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

**Before Situation:**

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of controlling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

**After Situation:**

A certified Technical Service Provider (TSP) develops the Drainage Water Management Conservation Activity Plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,930.60

**Scenario Cost/Unit:** $3,930.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $112.21 | 8 | $897.68 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 13 | $1,024.92 |
| Cap Labor, Survey and Mapping Technician | 1591 | 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. May verify accuracy and completeness of maps. | Hours | $56.56 | 16 | $904.96 |
| 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. | Hours | $34.47 | 32 | $1,103.04 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #3 - AgEDP Low Complexity, One Design

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,785.57

**Scenario Cost/Unit:** $2,785.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 18 | $1,864.44 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 10 | $451.20 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 1 | $29.77 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 8 | $440.16 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #19 - AgEDP Medium Complexity, One Design

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,213.46

**Scenario Cost/Unit:** $4,213.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 30 | $3,107.40 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 11 | $496.32 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 2 | $59.54 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 10 | $550.20 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #35 - AgEDP High Complexity, One Design

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,641.35

**Scenario Cost/Unit:** $5,641.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 42 | $4,350.36 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 12 | $541.44 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 3 | $89.31 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 12 | $660.24 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #51 - AgEDP Low Complexity, 2-3 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, "2-3 Designs" shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,323.50

**Scenario Cost/Unit:** $4,323.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 30 | $3,107.40 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 11 | $496.32 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 2 | $59.54 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 12 | $660.24 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #67 - AgEDP Medium Complexity, 2-3 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,751.39

**Scenario Cost/Unit:** $5,751.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 42 | $4,350.36 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 12 | $541.44 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 3 | $89.31 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 14 | $770.28 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #83 - AgEDP High Complexity, 2-3 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the AgEDP The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,179.28

**Scenario Cost/Unit:** $7,179.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 54 | $5,593.32 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 13 | $586.56 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 4 | $119.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 16 | $880.32 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #99 - AgEDP Low Complexity, 4-5 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, "4-5 Designs" shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,861.43

**Scenario Cost/Unit:** $5,861.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 42 | $4,350.36 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 12 | $541.44 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 3 | $89.31 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 16 | $880.32 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #115 - AgEDP Medium Complexity, 4-5 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,289.32

**Scenario Cost/Unit:** $7,289.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 54 | $5,593.32 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 13 | $586.56 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 4 | $119.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 18 | $990.36 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #131 - AgEDP High Complexity, 4-5 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,717.21

**Scenario Cost/Unit:** $8,717.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 66 | $6,836.28 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 14 | $631.68 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 5 | $148.85 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 20 | $1,100.40 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #147 - AgEDP Low Complexity, 6+ Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, "6+ Designs" shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,399.36

**Scenario Cost/Unit:** $7,399.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 54 | $5,593.32 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 13 | $586.56 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 4 | $119.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 20 | $1,100.40 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #163 - AgEDP Medium Complexity, 6+ Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,827.25

**Scenario Cost/Unit:** $8,827.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 66 | $6,836.28 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 14 | $631.68 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 5 | $148.85 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 22 | $1,210.44 |

**Practice:** 136 - Agricultural Energy Design Plan - Written

**Scenario:** #179 - AgEDP High Complexity, 6+ Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $10,255.14

**Scenario Cost/Unit:** $10,255.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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). | Hours | $103.58 | 78 | $8,079.24 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $45.12 | 15 | $676.80 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $29.77 | 6 | $178.62 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $55.02 | 24 | $1,320.48 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition - Written

**Scenario:** #10 - Conservation Plan Supporting Organic Transition CAP Crops and Livestock

**Scenario Description:**

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

**Before Situation:**

Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching mixed operation of crops and livestock. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for a certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,913.00

**Scenario Cost/Unit:** $5,913.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 75 | $5,913.00 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition - Written

**Scenario:** #11 - Conservation Plan Supporting Organic Transition CAP Crops or Livestock

**Scenario Description:**

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

**Before Situation:**

Agricultural operation currently managed using traditional and conventional methods for farming with only crops. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,045.76

**Scenario Cost/Unit:** $5,045.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $78.84 | 64 | $5,045.76 |

**Practice:** 142 - Fish and Wildlife Habitat Plan - Written

**Scenario:** #19 - Fish & Wildlife Habitat Management CAP (2 Land Uses)

**Scenario Description:**

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation. The CAP addresses fish and wildlife habitat management relative to two land uses on the agricultural operation of which each land use is at least 20 acres in size.

**Before Situation:**

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,523.08

**Scenario Cost/Unit:** $3,523.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $80.07 | 44 | $3,523.08 |

**Practice:** 142 - Fish and Wildlife Habitat Plan - Written

**Scenario:** #35 - Fish & Wildlife Habitat Management CAP (Three Land Uses)

**Scenario Description:**

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation. The CAP addresses fish and wildlife habitat management relative to two or more land uses on the agricultural operation of which at least three of the land uses are at least 20 acres in size

**Before Situation:**

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,163.64

**Scenario Cost/Unit:** $4,163.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $80.07 | 52 | $4,163.64 |

**Practice:** 142 - Fish and Wildlife Habitat Plan - Written

**Scenario:** #51 - Fish & Wildlife Habitat Management CAP (1 Land Use)

**Scenario Description:**

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation. The CAP addresses fish and wildlife habitat management relative to only one land use on the agricultural operation.

**Before Situation:**

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,882.52

**Scenario Cost/Unit:** $2,882.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $80.07 | 36 | $2,882.52 |

**Practice:** 146 - Pollinator Habitat Plan - Written

**Scenario:** #10 - Pollinator Habitat Enhancement Plan CAP

**Scenario Description:**

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

**Before Situation:**

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,362.94

**Scenario Cost/Unit:** $3,362.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $80.07 | 42 | $3,362.94 |

**Practice:** 146 - Pollinator Habitat Plan - Written

**Scenario:** #11 - Pollinator Habitat Enhancement Plan CAP - No Local TSP

**Scenario Description:**

Various on-farm land uses, No qualified TSP within 300 miles. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

**Before Situation:**

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,884.27

**Scenario Cost/Unit:** $4,884.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $80.07 | 61 | $4,884.27 |

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

**Scenario:** #56 - 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, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). 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.

**Feature Measure:** Measuring Sites

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $24,857.66

**Scenario Cost/Unit:** $24,857.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 130 | $4,093.70 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 136 | $13,138.96 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 4 | $125.00 |
| 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 | $31.25 | 240 | $7,500.00 |

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

**Scenario:** #57 - 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 sytems. 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.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $16,923.50

**Scenario Cost/Unit:** $16,923.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $80.29 | 60 | $4,817.40 |
| 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. | Hours | $34.47 | 130 | $4,481.10 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 4 | $125.00 |
| 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 | $31.25 | 20 | $625.00 |
| 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 | $31.25 | 40 | $1,250.00 |
| 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 | $31.25 | 20 | $625.00 |
| 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 | $31.25 | 40 | $1,250.00 |
| 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 | $31.25 | 40 | $1,250.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $31.25 | 40 | $1,250.00 |
| 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 | $31.25 | 40 | $1,250.00 |

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

**Scenario:** #59 - 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, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). 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.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $21,379.70

**Scenario Cost/Unit:** $21,379.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 130 | $4,093.70 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 100 | $9,661.00 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 4 | $125.00 |
| 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 | $31.25 | 240 | $7,500.00 |

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

**Scenario:** #60 - 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, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). 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, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). 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.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $48,737.14

**Scenario Cost/Unit:** $48,737.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 312 | $9,824.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 166 | $16,037.26 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 12 | $375.00 |
| 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 | $31.25 | 720 | $22,500.00 |

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

**Scenario:** #61 - Data Collect Tile Year 1 plus - 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, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). 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, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). 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 to next to the last year of monitoring 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.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $41,394.78

**Scenario Cost/Unit:** $41,394.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 312 | $9,824.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 90 | $8,694.90 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 12 | $375.00 |
| 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 | $31.25 | 720 | $22,500.00 |

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

**Scenario:** #63 - 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, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). 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, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). 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.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $45,259.18

**Scenario Cost/Unit:** $45,259.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 312 | $9,824.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 130 | $12,559.30 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 12 | $375.00 |
| 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 | $31.25 | 720 | $22,500.00 |

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

**Scenario:** #64 - 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, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). 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.

**Feature Measure:** Measuring Sites

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $34,126.18

**Scenario Cost/Unit:** $34,126.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 156 | $4,912.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 184 | $17,776.24 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 6 | $187.50 |
| 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 | $31.25 | 360 | $11,250.00 |

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

**Scenario:** #65 - 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, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). 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, semi-annual 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.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $25,044.84

**Scenario Cost/Unit:** $25,044.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 156 | $4,912.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 90 | $8,694.90 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 6 | $187.50 |
| 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 | $31.25 | 360 | $11,250.00 |

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

**Scenario:** #67 - 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, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). 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.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $30,841.44

**Scenario Cost/Unit:** $30,841.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 156 | $4,912.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 150 | $14,491.50 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 6 | $187.50 |
| 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 | $31.25 | 360 | $11,250.00 |

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

**Scenario:** #69 - 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, with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). 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, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). 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.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $58,817.21

**Scenario Cost/Unit:** $58,817.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 364 | $11,462.36 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 135 | $13,042.35 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 18 | $562.50 |
| 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 | $31.25 | 1080 | $33,750.00 |

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

**Scenario:** #71 - 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 with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). 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 with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). 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.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $64,613.81

**Scenario Cost/Unit:** $64,613.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 364 | $11,462.36 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 195 | $18,838.95 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $31.25 | 18 | $562.50 |
| 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 | $31.25 | 1080 | $33,750.00 |

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

**Scenario:** #39 - 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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $22,764.69

**Scenario Cost/Unit:** $22,764.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 60 | $1,889.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.12 | $291.55 |
| 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 | $16.42 | 1 | $16.42 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 | $2,139.41 | 1 | $2,139.41 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,207.20 | 1 | $9,207.20 |
| 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 monitering | Each | $2,706.00 | 1 | $2,706.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,036.93 | 1 | $1,036.93 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $1,220.00 | 1 | $1,220.00 |
| 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 | $2,251.00 | 1 | $2,251.00 |
| 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 | $439.29 | 1 | $439.29 |

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

**Scenario:** #41 - 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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $30,757.93

**Scenario Cost/Unit:** $30,757.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 100 | $3,149.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.12 | $291.55 |
| 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 | $16.42 | 1 | $16.42 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 | $2,139.41 | 2 | $4,278.82 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,207.20 | 1 | $9,207.20 |
| 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 monitering | Each | $2,706.00 | 2 | $5,412.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,036.93 | 2 | $2,073.86 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $1,220.00 | 1 | $1,220.00 |
| 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 | $754.69 | 1 | $754.69 |
| 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 | $2,251.00 | 1 | $2,251.00 |
| 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 | $439.29 | 1 | $439.29 |

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

**Scenario:** #43 - System Installation-Above And 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 different 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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $32,670.35

**Scenario Cost/Unit:** $32,670.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 60 | $1,889.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.12 | $291.55 |
| 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 | $16.42 | 2 | $32.84 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 | $2,139.41 | 2 | $4,278.82 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,207.20 | 1 | $9,207.20 |
| 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 monitering | Each | $2,706.00 | 2 | $5,412.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,036.93 | 2 | $2,073.86 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $1,220.00 | 2 | $2,440.00 |
| 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 | $2,251.00 | 2 | $4,502.00 |
| 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 | $439.29 | 2 | $878.58 |

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

**Scenario:** #44 - 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.

**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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,362.88

**Scenario Cost/Unit:** $2,362.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.12 | $291.55 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |

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

**Scenario:** #45 - 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.

**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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,445.84

**Scenario Cost/Unit:** $7,445.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 20 | $629.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.12 | $291.55 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 monitering | Each | $2,706.00 | 1 | $2,706.00 |
| 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 | $2,251.00 | 1 | $2,251.00 |

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

**Scenario:** #46 - 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.

**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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,043.72

**Scenario Cost/Unit:** $9,043.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 32 | $1,007.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.12 | $291.55 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 monitering | Each | $2,706.00 | 1 | $2,706.00 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $1,220.00 | 1 | $1,220.00 |
| 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 | $2,251.00 | 1 | $2,251.00 |

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

**Scenario:** #47 - 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.

**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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,158.27

**Scenario Cost/Unit:** $3,158.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 32 | $1,007.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.24 | $583.10 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |

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

**Scenario:** #48 - 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.

**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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $13,168.88

**Scenario Cost/Unit:** $13,168.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 32 | $1,007.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.24 | $583.10 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 monitering | Each | $2,706.00 | 2 | $5,412.00 |
| 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 | $2,251.00 | 2 | $4,502.00 |

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

**Scenario:** #49 - 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.

**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.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $15,860.80

**Scenario Cost/Unit:** $15,860.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 40 | $1,259.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.24 | $583.10 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| 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 monitering | Each | $2,706.00 | 2 | $5,412.00 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $1,220.00 | 2 | $2,440.00 |
| 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 | $2,251.00 | 2 | $4,502.00 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario:** #1 - Liquid Agrichemical Storage, Concrete Block 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 30 ft x 40 ft with flexible membrane lined walls. The walls are made of modular blocks stacked two high for a 4ft wall height on four sides. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Square Feet of storage area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $7,393.97

**Scenario Cost/Unit:** $6.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 15 | $440.10 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 22 | $675.40 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yards | $116.45 | 42 | $4,890.90 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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.

**Feature Measure:** Square Feet of storage area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 864.0

**Scenario Total Cost:** $7,511.39

**Scenario Cost/Unit:** $8.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 12 | $648.48 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 24 | $1,292.40 |
| **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. | Hours | $24.46 | 42 | $1,027.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 24 | $605.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 11 | $322.74 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 16 | $491.20 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Feet | $0.94 | 1088 | $1,022.72 |
| 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 Feet | $1.62 | 816 | $1,321.92 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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 mishandling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters and 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 unloads agrichemicals from a semi-trailer, 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 leach into 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 60' x 6" with a semi-trailer length of 53'. The handling pad for mixing and loading operations is sized to contain the length of a semi-trailer or 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.

**Feature Measure:** Square Feet of Handling Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 960.0

**Scenario Total Cost:** $9,026.62

**Scenario Cost/Unit:** $9.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 18 | $6,612.48 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 6 | $324.24 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 6 | $151.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 15 | $440.10 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $0.90 | 960 | $864.00 |
| **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 | $69.11 | 1 | $69.11 |
| 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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario:** #4 - Liquid Agrichemical Storage, Concrete Walls and 5 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 concrete floor and 1' concrete perimeter walls. The average size of the agrichemical handling facility for storage is 35' x 40' with a 5" thick slab. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Square Feet of storage area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,400.0

**Scenario Total Cost:** $14,089.63

**Scenario Cost/Unit:** $10.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 17 | $6,245.12 |
| 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 Yards | $487.76 | 10 | $4,877.60 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 6 | $324.24 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 22 | $645.48 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $0.90 | 1400 | $1,260.00 |
| **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 | $69.11 | 2 | $138.22 |
| 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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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 1800 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.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,157.23

**Scenario Cost/Unit:** $7,157.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 16 | $20.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 3 | $92.10 |
| Tank, storage tank, double wall, 4000 gallon, horizontal, steel, above ground | 1733 | Double wall horizontal steel storage tank. Includes cradles, coating, fittings, labor, equipment. Excludes foundations, pumps or piping. | Gallons | $3.82 | 1800 | $6,876.00 |
| **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 | $168.33 | 1 | $168.33 |

**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.

**Feature Measure:** Square Feet of storage area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.0

**Scenario Total Cost:** $1,992.98

**Scenario Cost/Unit:** $1.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 12 | $648.48 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 25 | $733.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 311 - Alley Cropping

**Scenario:** #2 - Single row bareroot planting stock

**Scenario Description:**

The crop or grass land is planted with rows of bareroot trees to increase crop diversity. Final row width, and spacing of trees within the row is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. Payment includes the trees, tree planting costs and foregone income for the area of land being removed from crop production and put into trees. The resource concerns are plant condition - inadequate structure and composition. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation.

**Before Situation:**

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

**After Situation:**

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing. Associated practices may include: 490 Tree/Shrub Site Preparation, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, and 484 Mulching

**Feature Measure:** planted seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 900.0

**Scenario Total Cost:** $1,941.52

**Scenario Cost/Unit:** $2.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.25 | $29.59 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 1.25 | $28.28 |
| 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. | Hours | $5.83 | 1.25 | $7.29 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.25 | $402.61 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.25 | $406.95 |
| **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. | Hours | $24.46 | 1.25 | $30.58 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 1.25 | $31.53 |
| 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. | Hours | $41.94 | 1.25 | $52.43 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.78 | 900 | $702.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 311 - Alley Cropping

**Scenario:** #3 - Single row bareroot planting stock with tree shelters

**Scenario Description:**

The crop or grass land is planted with rows of bareroot trees to increase crop diversity. Final row width, and spacing of trees within the row is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. Payment includes the trees, tree planting costs. tree shelters, and foregone income for the area of land being removed from crop production and put into trees. The resource concerns are plant condition - inadequate structure and composition. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation.

**Before Situation:**

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

**After Situation:**

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing. Associated practices may include: 490 Tree/Shrub Site Preparation, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

**Feature Measure:** planted seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 900.0

**Scenario Total Cost:** $7,051.42

**Scenario Cost/Unit:** $7.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.25 | $29.59 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 1.25 | $28.28 |
| 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. | Hours | $5.83 | 1.25 | $7.29 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.25 | $402.61 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.25 | $406.95 |
| **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. | Hours | $24.46 | 16.25 | $397.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 1.25 | $31.53 |
| 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. | Hours | $41.94 | 1.25 | $52.43 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.78 | 900 | $702.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $3.71 | 900 | $3,339.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 900 | $54.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.50 | 900 | $1,350.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 311 - Alley Cropping

**Scenario:** #251 - Single row container planting stock, less than 2 gallon with tree shelters

**Scenario Description:**

The crop or grass land is planted with rows of container stock trees to increase crop diversity. Final row width and spacing of trees within the row is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and the intent of the landowner. Payment includes the trees, tree planting costs, tree shelters, and foregone income for the area of land being removed from crop production and put into trees. The resource concerns are plant condition - inadequate structure and composition. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation.

**Before Situation:**

The landscape has been cropped or in perennial grass for many years. It is void of and perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

**After Situation:**

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing. Associated practices may include: 490 Tree/Shrub Site Preparation, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning and 484 Mulching.

**Feature Measure:** planted seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 900.0

**Scenario Total Cost:** $18,836.86

**Scenario Cost/Unit:** $20.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 150 | $1,720.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.25 | $402.61 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.25 | $406.95 |
| **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. | Hours | $24.46 | 150 | $3,669.00 |
| 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. | Hours | $41.94 | 20 | $838.80 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 900 | $7,002.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $3.71 | 900 | $3,339.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 1800 | $108.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.50 | 900 | $1,350.00 |

**Practice:** 311 - Alley Cropping

**Scenario:** #253 - Single row container planting stock, less than 2 gallons

**Scenario Description:**

The crop or grass land is planted with rows of container stock trees to increase crop diversity. Final row width, and spacing of trees within the row is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. Payment includes the trees, tree planting costs and foregone income for the area of land being removed from crop production and put into trees. The resource concerns are plant condition - inadequate structure and composition. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation.

**Before Situation:**

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

**After Situation:**

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing. Associated practices may include: 490 Tree/Shrub Site Preparation, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, and 484 Mulching

**Feature Measure:** planted seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 900.0

**Scenario Total Cost:** $11,345.11

**Scenario Cost/Unit:** $12.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 75 | $860.25 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.25 | $402.61 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.25 | $406.95 |
| **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. | Hours | $24.46 | 75 | $1,834.50 |
| 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. | Hours | $41.94 | 20 | $838.80 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 900 | $7,002.00 |

**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 environmentally 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) .

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 147,000.0

**Scenario Total Cost:** $30,563.96

**Scenario Cost/Unit:** $0.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 4110 | $17,549.70 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 980 | $872.20 |
| 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 Yards | $3.71 | 3130 | $11,612.30 |
| **Materials** | | | | | | |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $3.65 | 8 | $29.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #2 - Earthen Natural Storage

**Scenario Description:**

An embankment is constructed in a location to utilize naturally available storage to serve as a waste impoundment structure for storing 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 environmentally 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 153,000 ft3; embankment top width = 10'; 3:1 upstream slope; 3:1 downstream slope; compaction ratio = 1.1; settlement = 10%; total depth = 10'. 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) .

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 153,000.0

**Scenario Total Cost:** $14,910.98

**Scenario Cost/Unit:** $0.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 3260 | $13,920.20 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 518 | $461.02 |
| **Materials** | | | | | | |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $3.65 | 8 | $29.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #6 - Dry Stack Facility, Earthen Floor with Concrete Side Walls

**Scenario Description:**

This scenario consists of a dry stack facility with compacted earthen floor with concrete side walls. This scenario is intended for poultry litter or similar dry product. 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 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 environmentally 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' slab with walls. The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Walls are 5' reinforced concrete. Walls consist of three permimeter walls (40' + 56' + 40') for a total wall length of 136 linear feet. Walls allow for greater storage volume. Volume of structure for this scenario is taken as the volume of the space formed by the walls and floor, not including any angle of repose or piling of material above the walls. 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

**Feature Measure:** Volume of Structure

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 11,200.0

**Scenario Total Cost:** $15,750.11

**Scenario Cost/Unit:** $1.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 30 | $14,632.80 |
| 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 Yards | $2.12 | 83 | $175.96 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 83 | $354.41 |
| **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 | $168.33 | 2 | $336.66 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #7 - Dry Stack Facility, Concrete Floor without Side Walls

**Scenario Description:**

This scenario consists of a dry stack facility with reinforced concrete floor without 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. 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 environmentally 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 75'x226'. The facility floor is 5" reinforced concrete without side walls. 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

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 16,950.0

**Scenario Total Cost:** $105,019.01

**Scenario Cost/Unit:** $6.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 260 | $95,513.60 |
| 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 Yards | $2.12 | 630 | $1,335.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 315 | $1,345.05 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 206 | $6,324.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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 environmentally 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 permimeter 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

**Feature Measure:** Cubic Foot Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 11,200.0

**Scenario Total Cost:** $22,166.70

**Scenario Cost/Unit:** $1.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 4.5 | $820.89 |
| 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 Yards | $367.36 | 35 | $12,857.60 |
| 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 Yards | $487.76 | 2 | $975.52 |
| 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 Yards | $2.12 | 83 | $175.96 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 83 | $354.41 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 9 | $484.65 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $12.47 | 9 | $112.23 |
| **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. | Hours | $24.46 | 90 | $2,201.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 9 | $226.98 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 28 | $859.60 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Feet | $0.94 | 1315 | $1,236.10 |
| 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 Feet | $1.62 | 840 | $1,360.80 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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 environmentally 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 permimeter walls (40' + 56' + 40') for a total wall length of 136 linear feet. Volume of structure for this scenario is taken as the volume of the space formed by the walls and floor, not including any angle of repose or piling of material above the walls. 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

**Feature Measure:** Volume of Structure

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 11,200.0

**Scenario Total Cost:** $29,380.93

**Scenario Cost/Unit:** $2.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 35 | $12,857.60 |
| 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 Yards | $487.76 | 30 | $14,632.80 |
| 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 Yards | $2.12 | 83 | $175.96 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 83 | $354.41 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 28 | $859.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #10 - 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 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 environmentally 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 360.0

**Scenario Total Cost:** $5,460.92

**Scenario Cost/Unit:** $15.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 6 | $2,926.56 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $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. | Hours | $107.06 | 10 | $1,070.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 10 | $300.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 4 | $122.80 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 40 | $209.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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 drain fill 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 environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater, 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 3,840.0

**Scenario Total Cost:** $25,596.56

**Scenario Cost/Unit:** $6.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 10 | $3,673.60 |
| 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 Yards | $487.76 | 35 | $17,071.60 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 100 | $551.00 |
| 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. | Hours | $107.06 | 20 | $2,141.20 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 20 | $601.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 14 | $429.80 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 120 | $627.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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. 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 environmentally 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 4,400.0

**Scenario Total Cost:** $25,173.76

**Scenario Cost/Unit:** $5.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 25.7 | $9,441.15 |
| 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 Yards | $487.76 | 15.2 | $7,413.95 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 200 | $1,102.00 |
| 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. | Hours | $107.06 | 30 | $3,211.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 30 | $901.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 53 | $1,627.10 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 186.5 | $975.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #13 - Concrete Tank Open Top, 7,500 - 14,999 Cu Ft Storage

**Scenario Description:**

This scenario consists of installing an open top concrete tank that has a total storage volume from 7,500 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. 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 drain fill 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 environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater, 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 10,048.0

**Scenario Total Cost:** $39,761.76

**Scenario Cost/Unit:** $3.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 20 | $7,347.20 |
| 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 Yards | $487.76 | 50 | $24,388.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 200 | $1,102.00 |
| 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. | Hours | $107.06 | 30 | $3,211.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 30 | $901.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 48 | $1,473.60 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 160 | $836.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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. 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 drain fill 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 environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater, 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 168,000.0

**Scenario Total Cost:** $237,667.89

**Scenario Cost/Unit:** $1.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 346 | $127,106.56 |
| 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 Yards | $487.76 | 115 | $56,092.40 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 1667 | $9,185.17 |
| 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 Yards | $3.71 | 7000 | $25,970.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 514 | $15,779.80 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 580 | $3,033.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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 environmentally 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).

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $30,833.82

**Scenario Cost/Unit:** $7.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 15 | $5,510.40 |
| 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 Yards | $487.76 | 42 | $20,485.92 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 444 | $577.20 |
| 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 Yards | $2.12 | 22 | $46.64 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 74 | $315.98 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 22 | $121.22 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 102 | $90.78 |
| 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 Yards | $3.71 | 74 | $274.54 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 74 | $2,271.80 |
| **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 | $69.11 | 2 | $138.22 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 4 | $1,001.12 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #21 - Composted Bedded Pack, 5 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 environmentally 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 5" reinforced concrete floor; 20' openings on each end of structure. 5" reinforced concrete floor is the minimum requirement in Iowa. Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Obstruction Removal (500) and Roofs and Covers (367).

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $45,539.55

**Scenario Cost/Unit:** $11.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 62 | $22,776.32 |
| 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 Yards | $487.76 | 42 | $20,485.92 |
| 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 Yards | $2.12 | 22 | $46.64 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 37 | $157.99 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 22 | $121.22 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 102 | $90.78 |
| 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 Yards | $3.71 | 74 | $274.54 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 37 | $1,085.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #30 - Concrete Tank Open Top, 5,000 - 7,499 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 7,499 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. 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 drain fill 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 environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater, 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 1200 SF, and a total storage volume of 6,000 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 6,000.0

**Scenario Total Cost:** $31,602.22

**Scenario Cost/Unit:** $5.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 19 | $6,979.84 |
| 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 Yards | $487.76 | 34 | $16,583.84 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 203 | $1,118.53 |
| 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. | Hours | $107.06 | 30 | $3,211.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 30 | $901.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 47 | $1,442.90 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 165 | $862.95 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #36 - Concrete Tank Open Top, 50,000 - 109,999 Cu Ft Storage

**Scenario Description:**

This scenario consists of installing an open top concrete tank that has a total storage volume from 50,000 to 109,999 cubic feet. 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. 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 environmentally 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 feet deep, with a bottom area of 10,000 square feet, and a storage capacity of 80,000 cubic feet. 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 80,000.0

**Scenario Total Cost:** $134,788.07

**Scenario Cost/Unit:** $1.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 185 | $67,961.60 |
| 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 Yards | $487.76 | 80 | $39,020.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 710 | $3,912.10 |
| 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 Yards | $3.71 | 3477 | $12,899.67 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 274 | $8,411.80 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 398 | $2,081.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario:** #37 - Concrete Tank Open Top, 15,000 - 49,999 Cu Ft Storage

**Scenario Description:**

This scenario consists of installing an open top concrete tank that has a total storage volume from 15,000 to 49,999 cubic feet. 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. 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 environmentally 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 feet deep, with an interior bottom area of 3,786 square feet, and a total storage volume of 30,288 cubic feet. Outside dimensions, 4,225 square feet (includes 3 feet footing and 8 inch 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).

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 30,288.0

**Scenario Total Cost:** $67,026.10

**Scenario Cost/Unit:** $2.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 80 | $29,388.80 |
| 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 Yards | $487.76 | 50 | $24,388.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $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 Yards | $3.71 | 1450 | $5,379.50 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 126 | $3,868.20 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 248 | $1,297.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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 undesireable 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:**

Undesireable non-herbaceous species are controlled with a pass with a brush hog over the treatment area followed by spot chemcial 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.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $1,239.51

**Scenario Cost/Unit:** $49.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 6 | $296.22 |
| 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. | Hours | $70.17 | 8 | $561.36 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 2.5 | $69.80 |
| **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 | $69.11 | 1 | $69.11 |

**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 undesireable 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:**

Undesireable non-herbaceous species are controlled with a pass with a brush hog over the treatment area followed by spot chemcial 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.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $1,962.43

**Scenario Cost/Unit:** $78.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 12 | $592.44 |
| 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. | Hours | $70.17 | 10 | $701.70 |
| **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. | Hours | $24.46 | 14 | $342.44 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 7.5 | $209.40 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 314 - Brush Management

**Scenario:** #3 - Heavy 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 undesireable non-herbaceous cover, or the treatment area is on land with 18% - 25% slopes on average regardless of percent cover of undesireable 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:**

Undesireable non-herbaceous species are controlled with a combination of manual chainsawing, pass with a brush hog over the treatment area, and spot chemcial 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.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $4,852.63

**Scenario Cost/Unit:** $194.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 8 | $56.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 20 | $987.40 |
| 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. | Hours | $70.17 | 24 | $1,684.08 |
| **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. | Hours | $24.46 | 65 | $1,589.90 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 15 | $418.80 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 314 - Brush Management

**Scenario:** #4 - Very Heavy 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 undesireable non-herbaceous cover, or the treatment area is on land with greater than 25% slopes on average regardless of percent cover of undesireable 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:**

Undesireable non-herbaceous species are controlled with a combination of manual chainsawing, pass with a brush hog over the treatment area, and spot chemcial 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.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $7,888.53

**Scenario Cost/Unit:** $315.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 20 | $140.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 40 | $1,974.80 |
| 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. | Hours | $70.17 | 40 | $2,806.80 |
| **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. | Hours | $24.46 | 88 | $2,152.48 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 25 | $698.00 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 314 - Brush Management

**Scenario:** #284 - Linear Tree Removal for Grassland Bird Habitat

**Scenario Description:**

Scenario is to open the vista and visual ranges for Prairie Chickens and other grassland dependent birds and reduce grassland habitat fragmentation by removing undesirable trees. Establishment of herbaceous vegetative cover on the cleared site is accomplished through associated practices such as 327 Conservation Cover.

**Before Situation:**

Grassland habitat for Prairie Chickens and other grassland dependent birds is fragmented by fencerows and other linear areas grown up in mature trees and brush.

**After Situation:**

Habitat is improved by removal of mature trees and brush. Typical size of area cleared is 1,800 ft long by 30 ft wide. Due to the mature trees in the area to be cleared a dozer is typically required. Removed debris is piles and burned and the cleared area is seeded to wildlife friendly vegetation through associated practice 327 Conservation Cover. If needed, associated practice 382 Fence is utilized to protect the area from livestock.

**Feature Measure:** size of area cleared

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.2

**Scenario Total Cost:** $1,311.80

**Scenario Cost/Unit:** $1,093.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 8 | $821.04 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 314 - Brush Management

**Scenario:** #320 - Removal of Invasive Woody Understory, Light

**Scenario Description:**

All materials, equipment and labor required to remove invasive species on woodland. Treat scattered individual invasive woody plants. Less than 1/10th of the forest understory is composed of the invasive woody plant species. Invasive woody plants are not yet interfering with understory sunlight or forest health, but these plants will impact forest health if left untreated. Cut and stump treat, stem inject (hack and squirt), or basal bark apply specific forestry herbicides to prevent re-sprouting. Use a Current and approved Forest Management Plan for estimate of infested plants per acre that are to be removed.

**Before Situation:**

The land is an existing woodland where the understory is lightly infested with invasive woody species and wildlife habitat is lacking. The main resource concerns are degraded plant condition – excessive plant pest pressure, and fish and wildlife – inadequate habitat (cover/shelter) and/or inadequate food.

**After Situation:**

The land is no longer impacted by the invasive woody species and the overall condition of the woodland stand is improved. Additionally, the wildlife habitat is improved with the resulting increase in sunlight reaching the woodland floor.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $924.44

**Scenario Cost/Unit:** $92.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 16 | $112.00 |
| 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. | Hours | $70.17 | 4 | $280.68 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 1 | $27.92 |

**Practice:** 314 - Brush Management

**Scenario:** #321 - Removal of Invasive Woody Understory, Medium

**Scenario Description:**

All materials, equipment and labor required to remove invasive species on woodland. Between 10 and 50% of the woodland understory/midstory is compromised by woody invasive plants. The invasive woody plants are beginning to actively shade out native understory plants and forest regeneration, and/or are mature enough to start reproducing. Cut and stump treat, stem inject (hack and squirt), or basal bark apply with herbicide to prevent re-sprouting. Use a Current and approved Forest Management Plan for estimate of infested plants per acre that are to be removed.

**Before Situation:**

The land is an existing woodland where the understory is moderately infested with invasive woody species and wildlife habitat is lacking. The main resource concerns are degraded plant condition – excessive plant pest pressure, and fish and wildlife – inadequate habitat (cover/shelter) and/or inadequate food.

**After Situation:**

The land is no longer impacted by the invasive woody species and the overall condition of the woodland stand is improved. Additionally, the wildlife habitat is improved with the resulting increase in sunlight reaching the woodland floor.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,260.25

**Scenario Cost/Unit:** $126.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 20 | $140.00 |
| 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. | Hours | $70.17 | 5 | $350.85 |
| **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. | Hours | $31.49 | 20 | $629.80 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 5 | $139.60 |

**Practice:** 314 - Brush Management

**Scenario:** #322 - Removal of Invasive Woody Understory, Heavy

**Scenario Description:**

All materials, equipment and labor required to remove invasive species on woodland. 50-100% of the woodland understory/midstory is compromised by invasive woody plants. Both parent trees/shrubs and their sprouts or seedlings are present. Most native understory plants and forest regeneration are suppressed. Cut and stump treat, stem inject (hack and squirt), or basal bark apply specific forestry herbicides to prevent re-sprouting and suckering. This practice may also be used to mechanically shred or chip invasive woody plants with machinery like forestry mowers. Use a current and approved forest management plan for estimate of infested plants per acre that are to be removed.

**Before Situation:**

The land is an existing woodland where the understory is heavily infested with invasive woody species and wildlife habitat is lacking. The main resource concerns are degraded plant condition – excessive plant pest pressure, and fish and wildlife – inadequate habitat (cover/shelter) and/or inadequate food.

**After Situation:**

The land is no longer impacted by the invasive woody species and the overall condition of the woodland stand is improved. Additionally, the wildlife habitat is improved with the resulting increase in sunlight reaching the woodland floor.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,692.34

**Scenario Cost/Unit:** $569.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 26 | $182.00 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $90.63 | 33 | $2,990.79 |
| 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. | Hours | $70.17 | 6 | $421.02 |
| **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. | Hours | $31.49 | 26 | $818.74 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 33 | $832.26 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 10 | $279.20 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 315 - Herbaceous Weed Treatment

**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 undesireable 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.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $796.53

**Scenario Cost/Unit:** $31.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| 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. | Hours | $70.17 | 8 | $561.36 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 2.5 | $69.80 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 315 - Herbaceous Weed Treatment

**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 undesireable herbaceous cover, and spot treatment is preferred over blanket treatment to maintain the persistence of desireable 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.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $2,212.41

**Scenario Cost/Unit:** $88.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| 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. | Hours | $70.17 | 24 | $1,684.08 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 13 | $362.96 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 315 - Herbaceous Weed Treatment

**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.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $1,206.99

**Scenario Cost/Unit:** $48.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 25 | $142.00 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 6 | $151.32 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 25 | $698.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 315 - Herbaceous Weed Treatment

**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 mutiple 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.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $2,659.76

**Scenario Cost/Unit:** $106.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 6 | $296.22 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 50 | $284.00 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 10 | $252.20 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 50 | $1,396.00 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** 315 - Herbaceous Weed Treatment

**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. Chemcial 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 competion 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.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $558.90

**Scenario Cost/Unit:** $111.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 1 | $49.37 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 2 | $41.40 |
| **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. | Acres | $16.56 | 5 | $82.80 |
| 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 shipping only. | Acres | $1.51 | 5 | $7.55 |
| **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 | $69.11 | 1 | $69.11 |
| 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 | $168.33 | 1 | $168.33 |

**Practice:** 315 - Herbaceous Weed Treatment

**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.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $1,744.99

**Scenario Cost/Unit:** $349.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $70.17 | 22.5 | $1,578.83 |
| **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. | Acres | $6.47 | 15 | $97.05 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario:** #20 - hand and chemical

**Scenario Description:**

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. Herbicide is applied to control re-growth of target weeds. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres.

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species 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 improved wildlife habitat.

**Feature Measure:** acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,228.81

**Scenario Cost/Unit:** $122.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| 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. | Hours | $70.17 | 10 | $701.70 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 5 | $103.50 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.13 | 10 | $21.30 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **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. | Acres | $9.21 | 10 | $92.10 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario:** #36 - Chemical, Spot

**Scenario Description:**

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment, either initial or retreatment using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species 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 improved wildlife habitat.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,165.48

**Scenario Cost/Unit:** $58.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 18 | $372.60 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **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. | Acres | $9.21 | 20 | $184.20 |
| 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 shipping only. | Acres | $1.51 | 20 | $30.20 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #1 - Incinerator

**Scenario Description:**

This scenario consists of installing a manufactured Type IV incinerator. Payment includes the incinerator, fuel tank and concrete slab to support the incinerator and fuel tank. If a roof is to be included in the installation refer to Practice Standard 367 - Roofs and Covers. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**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 incineration, and protection from predators to minimize pathogen survival or spreading. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Feature Measure:** Pounds capacity of incinerator

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 400.0

**Scenario Total Cost:** $12,299.35

**Scenario Cost/Unit:** $30.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 4 | $1,469.44 |
| 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 Yards | $2.12 | 8 | $16.96 |
| 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. | Hours | $107.06 | 1 | $107.06 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 1 | $25.22 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 4 | $122.80 |
| Fuel Tank, Anchored | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only. | Gallons | $4.16 | 285 | $1,185.60 |
| Incinerator, 400 lbs/day | 1625 | Poultry and livestock incinerator with an approximate chamber capacity of 400 pounds per day. Includes equipment and after burner only. | Each | $9,097.53 | 1 | $9,097.53 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #20 - Medium- High Animal Composter

**Scenario Description:**

This scenario applies to composting of medium-sized animals, regardless of technology; each state is responsible for determining the size range of the animals to which this scenario applies. The typical scenario is a series of concrete bins, open on one end, on top of a concrete pad, to compost mortality in static piles with sufficient bulking material to allow natural aeration. The producer will be managing the composting with heavy equipment, requiring durable, concrete walls. 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. Where needed, use Practice Standard 561 - Heavy Use Area Protection adjacent to the composting facility for protected access, and Practice Standard 362 - Diversion to divert surface flow away from the facility. Typical scenario design uses the process outlined in the Illinois supplement to Chapter 10 of the Ag Waste Field Handbook (IL651.1007(f)), using a volume factor of 20 cubic feet. Animals being composted are grow-finish swine at an average weight of 165 lb, and the average mortality rate (death loss) for the operation is 4%, or 87 lbs/day for a 2400-head operation with 2 turns per year. The resulting typical design has twelve bins, each 10' x 9.8' by 5'7" high (reference standard drawing IL-ENG-149). Site preparation includes topsoil removal, minimal re-grading and compaction, installing gravel or sand sub base and then concrete.

**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. Potential Associated Practices: Roofs and Covers (367), Roof Runoff Structure (558), Heavy Use Area Protection (561), Underground Outlet (620), Diversion (362), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Subsurface Drain (606).

**Feature Measure:** pounds of dead animals per day

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 87.0

**Scenario Total Cost:** $26,442.52

**Scenario Cost/Unit:** $303.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 20 | $7,347.20 |
| 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 Yards | $487.76 | 37 | $18,047.12 |
| 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 Yards | $2.12 | 48 | $101.76 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 48 | $204.96 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 16 | $491.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #21 - Large Animal Composter

**Scenario Description:**

This scenario applies to composting of larger animals, regardless of technology; each state is responsible for determining the size range of the animals to which this scenario applies. The typical scenario is a concrete pad sized for composting animal mortality in windrow(s), including 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. Where needed, use Practice Standard 561 - Heavy Use Area Protection adjacent to the composting facility for protected access, and Practice Standard 362 - Diversion to divert surface flow away from the facility. Typical scenario design is Example 4 from the Ohio Livestock and Poultry Mortality Composting Manual. Animals being composted are cattle at an average weight of 1,400 lb, and the average mortality rate (death loss) for the operation is 20 lbs/day. The windrow system includes a primary and a secondary composting operation, with 30 days' worth of storage. The resulting typical design is a 25' x 60' concrete pad, 5" thick, with light reinforcement. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand sub base and then concrete. An earthen berm (2' tall, 4' topwidth with 2:1 side slopes) around three sides of the facility captures any leachate.

**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 is formulated for either normal or 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. Potential Associated Practices: Roofs and Covers (367), Roof Runoff Structure (558), Heavy Use Area Protection (561), Underground Outlet (620), Diversion (362), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Subsurface Drain (606).

**Feature Measure:** pounds of dead animals per day

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $9,608.19

**Scenario Cost/Unit:** $480.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 23 | $8,449.28 |
| 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 Yards | $2.12 | 56 | $118.72 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 107 | $456.89 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 19 | $583.30 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #22 - Small Animal Composter

**Scenario Description:**

This scenario applies to composting of small animals, regardless of technology; each state is responsible for determining the size range of the animals to which this scenario applies. The typical scenario is a series of concrete bins, open on one end, on top of a concrete pad, to compost mortality in static piles with sufficient bulking material to allow natural aeration. The producer will be managing the composting with heavy equipment, requiring durable, concrete walls. 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. Where needed, use Practice Standard 561 - Heavy Use Area Protection adjacent to the composting facility for protected access, and Practice Standard 362 - Diversion to divert surface flow away from the facility. Typical scenario design uses the Indiana NRCS composter design spreadsheet process. Animals being composted are poultry at an average weight of 3 lb, and the average mortality rate (death loss) for the operation is 4%, or 267 lbs/day for a 100,000-chicken operation with a 45 day cycle time. The resulting typical design has four bins, each 10' x 9.8' by 5'7" high (reference standard drawing IL-ENG-161. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand sub base and then concrete.

**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. Potential Associated Practices: Roofs and Covers (367), Roof Runoff Structure (558), Heavy Use Area Protection (561), Underground Outlet (620), Diversion (362), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Subsurface Drain (606).

**Feature Measure:** pounds of dead animals per day

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 267.0

**Scenario Total Cost:** $8,486.38

**Scenario Cost/Unit:** $31.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 7 | $2,571.52 |
| 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 Yards | $487.76 | 11 | $5,365.36 |
| 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 Yards | $2.12 | 18 | $38.16 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 18 | $76.86 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 6 | $184.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #23 - Medium - Low Animal Composter

**Scenario Description:**

This scenario applies to composting of medium-sized animals, regardless of technology; each state is responsible for determining the size range of the animals to which this scenario applies. The typical scenario is a series of concrete bins, open on one end, on top of a concrete pad, to compost mortality in static piles with sufficient bulking material to allow natural aeration. The producer will be managing the composting with heavy equipment, requiring durable, concrete walls. 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. Where needed, use Practice Standard 561 - Heavy Use Area Protection adjacent to the composting facility for protected access, and Practice Standard 362 - Diversion to divert surface flow away from the facility. Typical scenario design uses the process outlined in the Illinois supplement to Chapter 10 of the Ag Waste Field Handbook (IL651.1007(f)), using a volume factor of 10 cubic feet. Animals being composted are large poultry at an average weight of 12 lbs, and the average mortality rate (death loss) for the operation is 7%, or 108 lbs/day for a 14,500 - head operation with 3 turns per year. The resulting typical design has four bins, each 14' x 9.33' by 5' high. Site preparation includes topsoil removal, minimal re-grading and compaction, installing gravel or sand sub base and then concrete.

**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. Potential Associated Practices: Roofs and Covers (367), Roof Runoff Structure (558), Heavy Use Area Protection (561), Underground Outlet (620), Diversion (362), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Subsurface Drain (606).

**Feature Measure:** pounds of dead animals per day

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 108.0

**Scenario Total Cost:** $14,140.23

**Scenario Cost/Unit:** $130.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 18 | $6,612.48 |
| 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 Yards | $487.76 | 14 | $6,828.64 |
| 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 Yards | $2.12 | 27 | $57.24 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 27 | $115.29 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 9 | $276.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #30 - Extra Large Animal, Static Pile

**Scenario Description:**

This scenario consists of installing an impervious earthen pad to compost large animal mortalities, typically dairy cow, beef, sow or boar, in a static windrow or single pile. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. Piles turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option requires at least 2 more times the area in vegetation for runoff treatment. This may not be an option for sites will limited areas, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Any roofed portion of the facility will be addressed with Roofs and Covers (367). Any approach areas will be addressed with Heavy Use Area Protection (561). Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Subsurface Drain (606), and Underground Outlet (620)). Vegetative Treatment Area (635), Composting (317), Roofs and Covers (367), Heavy Use Area Protection (561)

**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 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. Typical system consists of a 50' x 50' compacted earth surface. Site can handle mortality for a 100 cow dairy with associated heifers and calves. On site soils can be recompacted to meet required imperviousness. Include sufficient area for processing equipment access. Use 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 removal of top 1.5' and recompacting.

**Feature Measure:** Pad Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $1,845.33

**Scenario Cost/Unit:** $0.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 140 | $597.80 |
| 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 Yards | $3.71 | 140 | $519.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**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 environmentally 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).

**Feature Measure:** Cubic Foot of Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 11,200.0

**Scenario Total Cost:** $22,158.49

**Scenario Cost/Unit:** $1.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 5 | $912.10 |
| 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 Yards | $367.36 | 35 | $12,857.60 |
| 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 Yards | $2.12 | 83 | $175.96 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 83 | $354.41 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 10 | $538.50 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $12.47 | 10 | $124.70 |
| **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. | Hours | $24.46 | 90 | $2,201.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 10 | $252.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 28 | $859.60 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Feet | $0.94 | 2085 | $1,959.90 |
| 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 Feet | $1.62 | 1032 | $1,671.84 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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 environmentally 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).

**Feature Measure:** Cubic Foot of Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 11,200.0

**Scenario Total Cost:** $31,569.45

**Scenario Cost/Unit:** $2.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 35 | $12,857.60 |
| 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 Yards | $487.76 | 35 | $17,071.60 |
| 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 Yards | $2.12 | 83 | $175.96 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 83 | $354.41 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 28 | $859.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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 environmentally 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).

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 16,950.0

**Scenario Total Cost:** $104,768.73

**Scenario Cost/Unit:** $6.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 260 | $95,513.60 |
| 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 Yards | $2.12 | 630 | $1,335.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 315 | $1,345.05 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 206 | $6,324.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 317 - Composting Facility

**Scenario:** #5 - Compacted Gravel Pad, 6 inch compacted gravel

**Scenario Description:**

A composting facility for manure and other agricultural organic by-products designed with a 6" 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 environmentally 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 6" of compacted gravel. 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).

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 16,950.0

**Scenario Total Cost:** $15,049.33

**Scenario Cost/Unit:** $0.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 1883 | $2,447.90 |
| 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 Yards | $2.12 | 630 | $1,335.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 315 | $1,345.05 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 315 | $9,670.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 318 - Short Term Storage of Animal Waste and By-Products

**Scenario:** #5 - Poly Cover, Earthen Pad

**Scenario Description:**

A compacted earthen pad is constructed to store wastes on a short-term basis between collection and utilization 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. Potential Associated Practices: Nutrient Management (590), Waste Recycling (633)

**Before Situation:**

Operator presently has a confined animal feeding operation and daily manure spreading operations are not possible due to weather. Manure and other agricultural waste by-products are not being managed in an environmentally safe manner. The wastes are either accumulating at the source, or are being stockpiled in environmentally vulnerable areas and not properly managed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

Using a compacted earthen pad with a cover provides an environmentally safe meaure for temporarily managing 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. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: volume of material temporarily stored 12,576 ft3, pad area 6,000 ft2 (60' X 100'); 4' width around edge of manure stack to properly anchor and cover the manure; footprint of manure pile: 52' X 92", 6' manure stack height on 4:1 slopes; cover is a 6 mil poly film; 15" x 1/2" dia auger anchors on 2' centers.

**Feature Measure:** Volume of stored manure solids

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 12,576.0

**Scenario Total Cost:** $4,506.88

**Scenario Cost/Unit:** $0.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 222 | $947.94 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.08 | 222 | $17.76 |
| Earthfill Material, purchased, common | 2060 | Purchased earthfill materials includes both silt or clay. Material only. | Cubic Yards | $14.04 | 234 | $3,285.36 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.18 | $5.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario:** #8 - Double Wall Tank

**Scenario Description:**

This practice scenario includes the replacement of an existing single wall fuel storage tank with a new double wall tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561).

**Before Situation:**

The agricultural operation has an existing single wall fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

This scenario is based on the replacement of an existing single wall tank(s) with a new double wall tank(s). Installation of "used" double wall tank(s) will not be allowed. A 3000 gallon horizontal or vertical antiroll tank (U/L 142-23 Secondary Containment Vessel) double walled which meets EPA regulations will be installed. Payment Schedule is based on the cost difference between a new single wall tank and new double wall tank of the same size. The double wall tank will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

**Feature Measure:** Tank volume

**Scenario Unit:** Gallons

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $6,293.91

**Scenario Cost/Unit:** $2.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $63.40 | 2 | $126.80 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Tank, storage tank, upgrade to a double wall from a single wall, horizontal, steel, above ground, variable cost portion | 2260 | Variable cost portion of the difference between a single wall and double wall horizontal steel storage tank. Includes cradles, coating, fittings, labor, equipment. Excludes foundations, pumps or piping. | Gallons | $1.78 | 3000 | $5,340.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario:** #9 - Earthen Containment

**Scenario Description:**

This practice scenario includes the construction of an earthen containment wall with a flexible membrane liner around an existing storage tank. The containment will not have a roof. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561).

**Before Situation:**

The agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

This scenario is based on containment for a 10,000 gallon tank. The containment will be lined with a flexible membrane liner. The containment volume is designed for 125% of the tank volume (10,000 gallons X 125% = 12,500 gallons). The bottom dimensions of the containment are 40 ft x 24 ft. The wall is 2.5 feet high with a 2 ft top width and 2:1 sideslopes. The total volume of earthfill = 114 CY. The flexible liner size = 1,872 SF. Tanks will be moved or raised to install base materials. Hauled in earthfill will be used to construct the dike. The flexible liner will be installed in conformance with the design and specifications. The completed structure will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

**Feature Measure:** Cubic Yard of compacted earthen w

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 114.0

**Scenario Total Cost:** $15,387.65

**Scenario Cost/Unit:** $134.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 126 | $538.02 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 114 | $396.72 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $63.40 | 2 | $126.80 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 18 | $552.60 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.26 | 50 | $63.00 |
| Geotextile, non-woven, heavy weight | 1210 | Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.55 | 208 | $322.40 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.29 | 1872 | $11,774.88 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $407.75 | 1 | $407.75 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario:** #10 - Corrugated Metal Wall Containment

**Scenario Description:**

This practice scenario includes the installation of a corrugated metal ring containment with a flexible membrane liner around an existing storage tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561)

**Before Situation:**

The agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

This scenario is based on containment for a 10,000 gallon tank. The containment will be lined with a flexible membrane liner. The containment volume is designed for 125% of the tank volume (10,000 gallons X 125% = 12,500 gallons). The bottom dimensions of the containment are 26 ft x 24 ft. The corrugated panel wall is 2.75 feet high. The total area of wall = 275 SF. The flexible liner size = 930 SF. Tanks will be moved or raised to install base materials. The corrugated wall and flexible liner will be installed in conformance with the design and specifications. The completed structure will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

**Feature Measure:** Square Ft of Corrugated Metal Wall

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 275.0

**Scenario Total Cost:** $5,276.44

**Scenario Cost/Unit:** $19.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 1.5 | $273.63 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 35 | $149.45 |
| 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. | Hours | $107.06 | 2 | $214.12 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $63.40 | 2 | $126.80 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| 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. | Hours | $24.46 | 96 | $2,348.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 12 | $368.40 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.26 | 40 | $50.40 |
| Deactivated. Fuel Containment Facility, corrugated metal panel wall with membrane liner, variable cost portion | 1732 | Variable cost portion of a secondary fuel containment facility including metal panels, support posts and flexible liner. Materials only. | Square Feet | $0.00 | 275 | $0.00 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $407.75 | 1 | $407.75 |
| Deactivated. Fuel Containment Facility, corrugated metal panel wall with membrane liner, fixed cost portion | 2061 | Fixed cost portion of a secondary fuel containment facility including metal panels, support posts and flexible liner. This portion is the base cost for the system. Materials only. | Each | $0.00 | 1 | $0.00 |
| **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 | $69.11 | 1 | $69.11 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario:** #11 - Concrete Containment Wall

**Scenario Description:**

This practice scenario includes the installation of a reinforced concrete wall containment with a concrete slab around an existing storage tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561).

**Before Situation:**

Existing agricultural operation that has single walled fuel/oil storage tank(s) not protected. The producer has developed an SPCC plan in accordance with EPA requirements, that requires an above ground secondary containment facility for on-farm oil products, in order to control the excessive release of organics into ground and surface waters, or to control the excessive sediment and turbidity in surface water.

**After Situation:**

This scenario is based on containment for a 4,700 gallon tank. The containment volume is designed for 125% of the tank volume (4,700 gallons X 125% = 5,875 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. Typical containment dimensions are 196 sqft bottom x 6" thick slab with 6" thick x 4' tall formed sidewalls. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity. Structure will provide an environmentally safe facility for handling and storage of these products.

**Feature Measure:** Volume of concrete in the wall

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.3

**Scenario Total Cost:** $5,139.69

**Scenario Cost/Unit:** $1,195.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 4.2 | $1,542.91 |
| 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 Yards | $487.76 | 4.3 | $2,097.37 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $63.40 | 2 | $126.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 4.2 | $128.94 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.26 | 30 | $37.80 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $407.75 | 1 | $407.75 |
| **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 | $69.11 | 1 | $69.11 |
| 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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario:** #12 - Modular Block Containment Wall

**Scenario Description:**

This practice scenario includes the installation of a modular block concrete wall containment with a flexible membrane liner over a 6" concrete floor. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561),

**Before Situation:**

Existing agricultural operation that has single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, that requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

This scenario is based on containment for a 6,000 gallon tank. The containment volume is designed for 125% of the tank volume (6,000 gallons X 125% = 7,500 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. The bottom dimensions of the containment are 26ft x 24ft. The 2ft x 2ft x 6ft modular blocks are stacked 2 high for a wall height of 4ft. The containment area is 624 sq.ft. The flexible liner size with a 2ft overlap and achored at the top of the modular block is 1224 sf. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity. Structure will provide an environmentally safe facility for handling and storage of these products.

**Feature Measure:** secondary containment area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 624.0

**Scenario Total Cost:** $19,960.84

**Scenario Cost/Unit:** $31.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 16 | $5,877.76 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 13 | $71.63 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $63.40 | 2 | $126.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 13 | $381.42 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 12 | $368.40 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.26 | 30 | $37.80 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.29 | 1224 | $7,698.96 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yards | $116.45 | 36 | $4,192.20 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $407.75 | 1 | $407.75 |
| **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 | $69.11 | 1 | $69.11 |
| 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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 325 - High Tunnel System

**Scenario:** #3 - High Tunnel System, Gothic Style

**Scenario Description:**

A manufactured frame of tubular steel covered with 4-year 6mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

**Before Situation:**

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include; soil erosion, soil condition, water quality, water quantity, plant condition, and energy use.

**After Situation:**

A gothic style seasonal high tunnel (30 x 72 ft.) has been installed and the growing season has been extended for 1-4 months on average. The gothic style is encouraged to hedge against possible failure under snow loads. Plant health and vigor is improved and there is decreased energy use by producing food locally.

**Feature Measure:** Area of tunnel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,160.0

**Scenario Total Cost:** $9,711.20

**Scenario Cost/Unit:** $4.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 80 | $1,956.80 |
| **Materials** | | | | | | |
| Hoop House, gothic style, base package | 1278 | Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials only, does not include labor. | Square Feet | $3.59 | 2160 | $7,754.40 |

**Practice:** 325 - High Tunnel System

**Scenario:** #48 - High Tunnel System, Quonset Style

**Scenario Description:**

A manufactured frame of tubular steel covered with 4-year 6mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

**Before Situation:**

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include; soil erosion, soil condition, water quality, water quantity, plant condition, and energy use.

**After Situation:**

A Quonset style seasonal high tunnel (30 x 72 ft.) has been installed and the growing season has been extended for 1-4 months on average. The gothic style is encouraged to hedge against possible failure under snow loads. Plant health and vigor is improved and there is decreased energy use by producing food locally.

**Feature Measure:** Area of Tunnel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,160.0

**Scenario Total Cost:** $7,961.60

**Scenario Cost/Unit:** $3.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 80 | $1,956.80 |
| **Materials** | | | | | | |
| Hoop House, quonset style, base package | 1277 | Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and polylock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only, does not include labor. | Square Feet | $2.78 | 2160 | $6,004.80 |

**Practice:** 326 - Clearing and Snagging

**Scenario:** #1 - Clearing and Snagging

**Scenario Description:**

Removal of vegetation, logs, or other material that impedes the proper functioning along a length of stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

**Before Situation:**

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-third to two-thirds of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

**After Situation:**

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

**Feature Measure:** Length of Channel

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $4,681.18

**Scenario Cost/Unit:** $15.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 10 | $1,026.30 |
| 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. | Hours | $107.06 | 10 | $1,070.60 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 20 | $140.00 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $57.62 | 10 | $576.20 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 32 | $807.04 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 327 - Conservation Cover

**Scenario:** #1 - Introduced Species

**Scenario Description:**

The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of dust emissions which improves air quality significantly. 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. Applies to conventional or organic systems.

**Before Situation:**

Crops such as corn, soybeans, or cotton may be conventionally or 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 exceed allowable tolerance, 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:**

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of significant dust emissions which improves air quality. 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $7,571.00

**Scenario Cost/Unit:** $151.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 150 | $1,560.00 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 50 | $325.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 50 | $1,001.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 50 | $1,067.00 |
| **Materials** | | | | | | |
| 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 | $0.52 | 2500 | $1,300.00 |
| 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 | $0.39 | 2000 | $780.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 50 | $1,537.50 |

**Practice:** 327 - Conservation Cover

**Scenario:** #2 - Native Species

**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 clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 50 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. Applies to conventional or organic systems

**Before Situation:**

Crops such as corn, soybeans, or cotton may be conventionally or 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 exceeds allowable tolerance, and 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:**

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent native grass vegetation which reduces soil erosion and water/sediment runoff, and eliminates dust emissions which improves air quality. 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $10,196.50

**Scenario Cost/Unit:** $203.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 150 | $1,560.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 100 | $2,003.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 50 | $1,067.00 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 50 | $5,566.50 |

**Practice:** 327 - Conservation Cover

**Scenario:** #3 - Orchard or Vineyard Alleyways

**Scenario Description:**

This practice applies on orchards and vineyards needing permanent protective cover in the alleyways between tree and vine rows. The typical size of this practice is 20 acres. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation (scenario includes non-native grass and legume mix). This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, enhance wildlife and/or pollinator habitat, manage plant pests, and reduce air quality impacts. Typically 60% of the surface area is conservation cover per acre.

**Before Situation:**

Orchard or vineyard with bare soil between vine/tree rows. Bare soil is exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter sediment/nutrient runoff from orchards/vineyards increases. Soil erosion exceeds tolerable levels. 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 long periods of bare soil. Little to no wildlife/pollinator habitat is present.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and has been applied. Orchard or Vineyard area between vine/tree rows are planted with permanent introduced grass/legume mix. Area covered has reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of significant amounts of dust emissions.. Plants sown for conservation cover may provide cover for beneficial insects, pollinators, and wildlife.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,091.00

**Scenario Cost/Unit:** $104.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 24 | $249.60 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 12 | $78.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 24 | $480.72 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 12 | $256.08 |
| **Materials** | | | | | | |
| 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 | $0.52 | 600 | $312.00 |
| 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 | $0.39 | 480 | $187.20 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 480 | $158.40 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 12 | $369.00 |

**Practice:** 327 - Conservation Cover

**Scenario:** #4 - Pollinator Species

**Scenario Description:**

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet, rill, and wind 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. Applies to conventional or organic systems.

**Before Situation:**

Crops such as corn, soybeans, or cotton may be conventionally or 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. Erosion exceeds tolerable rates and 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:**

The 327 Implementation Requirements have been developed for the site and applied. Land is covered with permanent pollinator habitat including a mix of native grasses, legumes, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $701.01

**Scenario Cost/Unit:** $701.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 2 | $40.06 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **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. | Hours | $31.49 | 4 | $125.96 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**Practice:** 327 - Conservation Cover

**Scenario:** #10 - Conservation Cover for Water Quality and Wildlife, Foregone Income - Level 1 (Year 1)

**Scenario Description:**

Permanent vegetation, including a mix of introduced cool season grasses and legumes, established on cropped wetland area needing permanent vegetative cover that improves water quality and provides wetland wildlife habitat. Typical practice size is 2 acres. Practice applicable on cropland.

**Before Situation:**

Setting is any prairie pothole. The wetlands must be wholly or partially in cropland. These wetlands are currently cropped, and hydrology has or could be diverted from the wetland by way of tiling, field or road ditching, diking or any other feature that removes wetland hydrology. These wetter or more water saturated portions of cropland fields degrade water quality by nutrients carried through surface inlets. These areas also have the potential to produce a significant amount of moist soil plants which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. The current system provides little to no wildlife habitat with habitat limiting factors such as quality, quantity and continuity of forage, cover, shelter and space being identified. Drainage could also result in inadequate wildlife water and inadequate habitat.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and applied. The permanent grass/legume mix vegetation replacing the previously cropped wetland has improved water quality and wetland wildlife habitat.

**Feature Measure:** Area Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $833.49

**Scenario Cost/Unit:** $416.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 4 | $41.60 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 2 | $40.06 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 2 | $42.68 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1 | $322.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1 | $325.56 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 2 | $61.50 |

**Practice:** 327 - Conservation Cover

**Scenario:** #22 - Monarch Species Mix

**Scenario Description:**

Establish permanent vegetative cover for pollinator habitat according to state specifications. Typically used for high quality nectar and pollen species. Assumes seed/plugs, equipment and labor for seed bed prep/planting, and weed management during establishment. Used for conventional or organic land on small, intensive areas that are central to specialty crop production. Not typically used for large-scale plantings. This is applicable to both organic and non-organic conditions.

**Before Situation:**

Old hayfields that are mowed typically in the fall lack milkweed needed for monarchs. Other crops such as corn, soybeans, or cotton are conventionally grown and harvested. The system provides little to no wildlife or pollinator habitat.

**After Situation:**

The 327 Implementation Requirements have been developed and applied for the site. Land covered with permanent monarch habitat including a mix of milkweed species, native grasses, legumes, and forbs. Plants sown for monarch habitat may also provide cover for beneficial insects and wildlife.

**Feature Measure:** area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $884.52

**Scenario Cost/Unit:** $884.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 2 | $40.06 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **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. | Hours | $31.49 | 4 | $125.96 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1.4 | $642.29 |

**Practice:** 327 - Conservation Cover

**Scenario:** #55 - Interseeding Native Forbs, Pollinator or Monarch Mixes

**Scenario Description:**

Enhance existing perennial vegetative cover with the interseeding of native forbs, and/or milkweeds and/or other high quality nectar and pollen species to enhance beneficial organism habitat. Scenario is appropriate for conventional or organic production. Payment includes seed, seeding and fertility for interseeding establishment.

**Before Situation:**

Existing grass/legume stand that lacks the species diversity needed to meet the producer's goals such as attracting targeted species such as the Monarch Butterfly.

**After Situation:**

A more diverse mix of forbs, milkweed species, native grasses, legumes, and/or forbs provides improved habitat. Payment scenario is based on running a no till drill through ½ of the area to enhance the current perennial vegetation.

**Feature Measure:** area interseeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,905.20

**Scenario Cost/Unit:** $245.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 10 | $104.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 10 | $213.40 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 10 | $4,587.80 |

**Practice:** 327 - Conservation Cover

**Scenario:** #72 - Introduced with Forgone Income

**Scenario Description:**

This practice applies on organically managed land needing permanent protective cover. This practice typically involves conversion from an intensive organic cropping system to permanent non-native vegetation (scenario includes non-native grass/legume mix). The typical size of the practice is 20 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 mainly by cultivation. Soil surface residue amounts average 10% or less. Erosion exceeds tolerable rates and 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:**

The 327 Implementation Requirements have been developed for the site and has been applied. Organically managed land covered with permanent non- native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. . 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $22,422.25

**Scenario Cost/Unit:** $448.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 150 | $1,560.00 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 50 | $325.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 50 | $1,001.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 50 | $1,067.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 25 | $8,052.25 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 25 | $8,139.00 |
| **Materials** | | | | | | |
| Nitrogen, Organic | 266 | ORGANIC Nitrogen | Pound | $0.24 | 2500 | $600.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.07 | 2000 | $140.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 50 | $1,537.50 |

**Practice:** 327 - Conservation Cover

**Scenario:** #73 - Native Species with Forgone Income

**Scenario Description:**

This practice applies on conventional or organically managed land needing permanent protective cover. This practice typically involves conversion from an intensive cropping system to permanent native vegetation (scenario includes native grass/legume mix). The typical size of the practice is 50 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. Applies to conventional or organic systems.

**Before Situation:**

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and 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:**

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $26,387.75

**Scenario Cost/Unit:** $527.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 150 | $1,560.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 100 | $2,003.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 50 | $1,067.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 25 | $8,052.25 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 25 | $8,139.00 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 50 | $5,566.50 |

**Practice:** 327 - Conservation Cover

**Scenario:** #74 - Pollinator Species with Forgone Income

**Scenario Description:**

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 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. Applies to conventional or organic systems.

**Before Situation:**

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and 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:**

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent pollinator habitat including a mix of native grasses, legumes, and forbs (mix may also include non-native species). This practice may also reduce soil erosion, reduce water/sediment runoff, and improve air quality due to the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $875.21

**Scenario Cost/Unit:** $875.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 2 | $40.06 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**Practice:** 327 - Conservation Cover

**Scenario:** #84 - Monarch Species Mix with Foregone Income

**Scenario Description:**

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators such as the Monarch butterfly. Typical practice size is variable depending on site, but is most typical in smaller-scale plantings. As such, this scenario uses 1 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. Applies to conventional or organic systems.

**Before Situation:**

Row crops such as corn and soybeans may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and 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:**

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent pollinator habitat established to specifically promote Monarch butterfly habitat. Vegetation includes a mix of milkweed species, native grasses, legumes, and forbs (mix may also include non-native species). This practice may also reduce soil erosion, reduce water/sediment runoff, and improve air quality due to the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

**Feature Measure:** area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $875.21

**Scenario Cost/Unit:** $875.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $20.03 | 2 | $40.06 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**Practice:** 328 - Conservation Crop Rotation

**Scenario:** #1 - Basic Rotation Organic and Non-Organic

**Scenario Description:**

In this region this practice may be part of a conservation management system on both organic and non-organic operations to: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. No foregone income. 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 established that provides additional high residue and/or perennial crops that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce the concentration of salts and other chemicals from saline seeps, reduce plant pest pressures, provide feed and forage for domestic livestock, or provide food and cover habitat for wildlife, including pollinator forage, and nesting.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,258.20

**Scenario Cost/Unit:** $12.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $41.94 | 30 | $1,258.20 |

**Practice:** 328 - Conservation Crop Rotation

**Scenario:** #5 - Specialty Crops Organic and Non-Organic

**Scenario Description:**

In this region a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 50 acre specialty crop farm. No foregone income. Cost represents typical situations for organic and non-organic producers.

**Before Situation:**

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concerns.

**After Situation:**

The rotation established adds higher residue crop(s) to the rotation that will treat one or more of the following resource concerns on organic and non- organic farms: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,677.60

**Scenario Cost/Unit:** $33.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $41.94 | 40 | $1,677.60 |

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

**Scenario:** #1 - No-Till/Strip-Till

**Scenario Description:**

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of 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 establish and harvest crops. 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 includes non-tillage types of weed control and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields of organic and non-organic operations.

**Before Situation:**

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage, seedbed preparation 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. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill 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:**

The Implementation Requirements for 329 Residue Management, No Till is prepared and installed. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes 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 provides cover for wildlife. 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,134.00

**Scenario Cost/Unit:** $21.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 100 | $2,134.00 |

**Practice:** 330 - Contour Farming

**Scenario:** #3 - Contour Farming

**Scenario Description:**

This scenario meets the specifications of the NRCS Contour Farming Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in laying out and implementing contour farming. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways

**Before Situation:**

The typical field size in this geographical region for this scenario is 30 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations on this cropland field including disking, bedding, planting, and cultivation are performed generally up and down the the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

**After Situation:**

Implementation Requirements are prepared according to 330 Contour Farming and implemented. This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and "stake" contour row arrangement. Permanent row markers are established to ensure that this practice is maintained for the life of this practice. All field operations including: disking, bedding, planting, and cultivation are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operator is properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has be significantly reduced.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $275.59

**Scenario Cost/Unit:** $9.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| 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. | Hours | $41.94 | 3 | $125.82 |

**Practice:** 332 - Contour Buffer Strips

**Scenario:** #12 - Native Species, Foregone Income (Organic and Non-organic)

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are organically or non-organically farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum 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 water erosion to tolerable levels in the cropped area of the field.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $401.20

**Scenario Cost/Unit:** $401.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | -2 | ($60.98) |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 1 | $111.33 |

**Practice:** 332 - Contour Buffer Strips

**Scenario:** #13 - Introduced Species, Foregone Income (Organic and Non-Organic)

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production. This applies to both organic and non-organic.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $415.60

**Scenario Cost/Unit:** $415.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 20 | $7.80 |
| Sulfate of Potash | 263 | Approved for Organic Systems - Muriate of Potash | Pound | $0.65 | 20 | $13.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 1 | $30.75 |

**Practice:** 332 - Contour Buffer Strips

**Scenario:** #14 - Wildlife/Pollinator, Foregone Income (Organic and Non-Organic)

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production. This applies to organic and no-organic.

**Before Situation:**

Water Erosion Calculator (e.g. RUSLE2) indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Plant species will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, producer objectives, and the targeted wildlife/pollinators necessary food and/or cover. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/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 sheet and rill erosion to tolerable levels on the cropped area of the field.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $809.63

**Scenario Cost/Unit:** $809.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**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.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $1,262.83

**Scenario Cost/Unit:** $31.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 4 | $82.80 |
| 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. | Hours | $13.72 | 4 | $54.88 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $2.55 | 5 | $12.75 |
| **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 | $69.11 | 1 | $69.11 |

**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.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $417.10

**Scenario Cost/Unit:** $41.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 1 | $20.70 |
| 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. | Hours | $13.72 | 1 | $13.72 |
| **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. | Hours | $31.49 | 4 | $125.96 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $2.55 | 5 | $12.75 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 338 - Prescribed Burning

**Scenario:** #3 - Woodland, >10 acres

**Scenario Description:**

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. A woodland burn can consume debris or leaf litter under controlled conditions that otherwise could burn uncontrollably and devastatingly. Prior to burning, unit may need to be treated to reduce slash height and quantities. Burn should be cool enough to not cause mortality to residual stand but still reduce litter and debris and promote desired plant community. Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios.

**Before Situation:**

Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present. Desirable plant composition is lacking due to reduced plant vigor and/or invasive species are becoming established.

**After Situation:**

Litter, debris and slash are consumed, small seedlings may be killed during active burning. Residual larger trees have little to no scorching. Post treatment fire danger is significantly reduced and desired plant community is promoted/restored.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $3,156.17

**Scenario Cost/Unit:** $78.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 8 | $165.60 |
| Trailer, water tank | 1598 | Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment. | Hours | $20.50 | 8 | $164.00 |
| 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. | Hours | $13.72 | 8 | $109.76 |
| **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. | Hours | $31.49 | 48 | $1,511.52 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $2.55 | 10 | $25.50 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 338 - Prescribed Burning

**Scenario:** #4 - Woodland, Small acreage (<=10 acres)

**Scenario Description:**

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. A woodland burn can consume debris or leaf litter under controlled conditions that otherwise could burn uncontrollably and devastatingly. Prior to burning, unit may need to be treated to reduce slash height and quantities. Burn should be cool enough to not cause mortality to residual stand but still reduce litter and debris and promote desired plant community. Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios.

**Before Situation:**

Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present. Desirable plant composition is lacking due to reduced plant vigor and/or invasive species are becoming established.

**After Situation:**

Litter, debris and slash are consumed, small seedlings may be killed during active burning. Residual larger trees have little to no scorching. Post treatment fire danger is significantly reduced and desired plant community is promoted/restored.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,119.92

**Scenario Cost/Unit:** $111.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 2 | $41.40 |
| 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. | Hours | $13.72 | 2 | $27.44 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $2.55 | 5 | $12.75 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 340 - Cover Crop

**Scenario:** #1 - Cover Crop - Basic (Organic and Non-organic)

**Scenario Description:**

Typically a small grain or legume (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of a row crop, 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 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 an approved herbicide prior to planting the 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. 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. Erosion exceeds soil loss tolerances. 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:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of the row crop, fields are planted with a small grain or legume cover crop (may also use forage sorghum, radishes, turnips, buckwheat, etc.), typically rye or clover. The average field size is 40 acres. The cover crop is seeded with a 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. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,752.40

**Scenario Cost/Unit:** $68.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 40 | $227.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 40 | $853.60 |
| **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. | Acres | $9.21 | 40 | $368.40 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 40 | $1,303.20 |

**Practice:** 340 - Cover Crop

**Scenario:** #6 - Cover Crop - Adaptive Management

**Scenario Description:**

The practice scenario is for the implementation of cover crops in small replicated plots to allow the producer to learn how to manage cover crops on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular cover crop management strategy (e.g., cover crop vs no cover crop, multiple species vs, single species, evaluate different termination methods or timings, using a legume vs no legume for nitrogen credits). This will be done following the guidance in the NRCS Technical Note 10 - Adaptive Management.

**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. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. 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. The producer is considering the use of cover crops but is unsure how to manage on their unique operation or is seeking a way to better manage cover crops in the operation.

**After Situation:**

Implementation Requirements for Cover Crop (340) will be prepared along with the Adaptive Management plan for the replicated cover crop plots and implemented. Installation of this scenario will result in establishment of a cover crop replicated plots to compare to different management strategies for cover crop management following the guidance in the Agronomy Technical Note 10 - Adaptive Management. Implementation involves establishing the replicated plots to evaluate one or more cover crop management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in cover crop management. Results are used to make cover crop management decisions to address erosion and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

**Feature Measure:** Based on 10 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,450.00

**Scenario Cost/Unit:** $2,450.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 10 | $56.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 10 | $213.40 |
| **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. | Hours | $31.49 | 20 | $629.80 |
| 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. | Hours | $24.46 | 40 | $978.40 |
| **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. | Acres | $9.21 | 10 | $92.10 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 10 | $479.50 |

**Practice:** 340 - Cover Crop

**Scenario:** #11 - Cover Crop - Multiple Species (Organic and Non-organic)

**Scenario Description:**

Typically the multi-species cover crop (two or more species) mix includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc.). This mix will address all the purposes of the Cover Crop (340) standard. Typically the cover crop is seeded immediately after harvest of a row crop, but may be inter-seeded into a row crop using a broadcast seeder, drill, or similar device. The cover crop will be followed by another row crop and will utilize the residue as a mulch. 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 an approved herbicide or tillage prior to planting the subsequent crop and terminated per the NRCS Cover Crop Termination Guidelines.

**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. 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. Erosion exceeds soil loss tolerances. 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:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after the harvest of row crop, fields are planted with a multi-species (2 or more species) cover crop mix that generally includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc. The average field size is 40 acres. The cover crop is seeded with a drill, broadcast seeder, aerial broadcast, or other method. 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. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide 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.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $3,367.20

**Scenario Cost/Unit:** $84.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 40 | $227.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 40 | $853.60 |
| **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. | Acres | $9.21 | 40 | $368.40 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 40 | $1,918.00 |

**Practice:** 340 - Cover Crop

**Scenario:** #20 - Winter Kill Cover Crop Species

**Scenario Description:**

Typically a single species grass/legume/brassica or multiple species mix of grass/legume/brassica cover will be planted as a cover crop using appropriate methods into standing crop or immediately after harvest of a row crop, and will be followed by a row crop that will utilize fixed nitrogen, and cover crop biomass as a mulch. This scenario reflects costs associated with aerial seeding, but any appropriate seeding method may be used. The cover crop should be allowed to generate as much biomass as possible before the crop is winter killed. This scenario assumes the cover crop species will 'winter kill', therefore no additional termination measures are included. However, appropriate termination methods should be used as needed based on the specific situation, prior to planting the 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:**

Implementation requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of row crop, fields are planted with a single species or mix species cover crop, as outlined in the plan details. The average corn belt field size is 100 acres. The cover crop is seeded with a no-till drill, broadcast seeder, aerial seeding, or other method. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, into or throughout the winter, and potentially 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.

**Feature Measure:** Area Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,675.00

**Scenario Cost/Unit:** $46.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, Aerial | 958 | Broadcast seed via aerial operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $14.17 | 100 | $1,417.00 |
| **Materials** | | | | | | |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 100 | $3,258.00 |

**Practice:** 340 - Cover Crop

**Scenario:** #47 - Cover Crop - 1 acre or less

**Scenario Description:**

Typically a small grain or legume will be planted as a cover crop immediately after harvest of a crop, and will be followed by a crop. This scenario assumes that seed will be planted by hand. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will typically be terminated by mowing or tilling prior to planting the subsequent crop.

**Before Situation:**

Crops such as sweet corn, vegetables, or root crops 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. Erosion exceeds soil loss tolerances. 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:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 10 days after harvest of the crop, fields are planted with a small grain or legume cover crop, typically rye or clover. The average field size is 0.25 acres. The cover crop is seeded by hand. 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. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide 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.

**Feature Measure:** area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.3

**Scenario Total Cost:** $78.91

**Scenario Cost/Unit:** $315.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Walk-behind Rototiller | 2723 | 8 hp walk-behind rototiller, one-day rental | Day | $169.84 | 0.25 | $42.46 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 0.25 | $11.99 |

**Practice:** 342 - Critical Area Planting

**Scenario:** #1 - Native or Introduced Vegetation - Normal Tillage (Organic and Non-Organic)

**Scenario Description:**

Establishment of permanent vegetation (Native and Introduced) on a site (both organic and non-organic) 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 and water erosion that exceed soil loss tolerances. 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:**

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at a depth of four to six inches to improve fertility and ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

**Feature Measure:** area seeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $203.12

**Scenario Cost/Unit:** $203.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 2 | $20.80 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 60 | $23.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 60 | $19.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |

**Practice:** 342 - Critical Area Planting

**Scenario:** #4 - Native or Introduced Vegetation - Moderate Grading (Organic and Non-Organic)

**Scenario Description:**

Establishment of permanent vegetation (native and introduced) 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 that requires some moderate grading to prepare a seedbed. 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:**

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard.. This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

**Feature Measure:** area seeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $515.00

**Scenario Cost/Unit:** $515.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 2 | $20.80 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 60 | $23.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 60 | $19.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 1 | $32.58 |

**Practice:** 342 - Critical Area Planting

**Scenario:** #22 - 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).

**Feature Measure:** Area of Planting

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5.26

**Scenario Cost/Unit:** $5.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 0.02 | $0.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 0.02 | $0.13 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 0.02 | $0.16 |
| 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. | Acres | $11.75 | 0.02 | $0.24 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 0.02 | $0.17 |
| **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 | $0.44 | 2.07 | $0.91 |
| 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 | $0.39 | 2.07 | $0.81 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 2.07 | $0.68 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 0.05 | $0.81 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 0.02 | $1.14 |

**Practice:** 342 - Critical Area Planting

**Scenario:** #51 - Gully Repair and Seeding with Native or Introduced Vegetation

**Scenario Description:**

Repair and seeding of an area with gully erosion where repair requires a dozer for earthmoving to fill in and reshape the area followed by seeding. Scenario is generally for locations in pasture/hayland or farmsteads with watershed areas 5 acres or less; however scenario may also be applicable to other locations. This scenario is not to be used in a location with a well defined channel. Costs include a dozer for grading and shaping, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime.

**Before Situation:**

Gullies have formed in a pasture that needs to be repaired to prevent further soil loss. Site assessment has indicated that the drainage area is small enough that a repair through Critical Area Planting will be sufficient.

**After Situation:**

Implementation requirements are prepared and implemented according to the Critical Area Planting (342) standard. The area is stabilized by grading and shaping the area with gully erosion with a dozer and then applying fertilizer, lime and seed. Livestock will be excluded or have limited access to the area until vegetation is established. The site will be stabilized, erosion reduced and offsite damages reduced/eliminated.

**Feature Measure:** Area repaired and seeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,566.04

**Scenario Cost/Unit:** $2,566.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 16 | $1,642.08 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 16 | $480.96 |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 60 | $23.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 60 | $19.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 345 - Residue and Tillage Management, Reduced Till

**Scenario:** #2 - Residue and Tillage Management, Reduced Till

**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 by the planter/drill or tillage tools prior to planting. This practice includes tillage methods commonly referred to as mulch tillage, vertical tillage, chiseling and disking, or the use of high disturbance drills without additional tillage. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops, to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly spread or managed over the surface throughout the critical erosion period(s). 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 crop residue on the soil surface. The NRCS erosion prediction model(s) will be used to review the farming operations and determine the amount of surface residue to manage throughout the rotation to keep soil loss below T. The producer will adopt a reduced till system to meet one or more of the practice purposes.

**Before Situation:**

Crops such as corn, soybeans, small grains, or cotton are grown and harvested. Fields are tilled 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 increase. Sheet, rill and wind erosion occurs. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Runoff from the fields flows into streams, water courses or other water bodies causing water quality degradation. 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:**

The Implementation Requirements are prepared following the criteria in the 345 Residue and Tillage Management, Reduced Till conservation practice standard. Reduced till applies to all cropland and other lands where crops are planted. This scenario includes the use of a reduce till systems and high disturbance drills, such as a hoe drill, air seeder, or no-till drill that disturbs a large percentage of soil surface during the planting operation. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and water/wind erosion are reduced and water quality improves. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,896.00

**Scenario Cost/Unit:** $18.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| 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. | Acres | $18.96 | 100 | $1,896.00 |

**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).

**Feature Measure:** Embankment volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $7,807.60

**Scenario Cost/Unit:** $5.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 7 | $378.28 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 18 | $6,366.78 |
| Roller, static, towed, tamping foot | 1328 | Towed static tamping foot (sheepsfoot) roller compactor typically 60 inch diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer. | Hours | $15.19 | 4 | $60.76 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 25 | $751.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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).

**Feature Measure:** Embankment volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $10,691.02

**Scenario Cost/Unit:** $7.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 7 | $378.28 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 18 | $6,366.78 |
| Roller, static, towed, tamping foot | 1328 | Towed static tamping foot (sheepsfoot) roller compactor typically 60 inch diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer. | Hours | $15.19 | 4 | $60.76 |
| **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. | Hours | $24.46 | 22 | $538.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 25 | $751.50 |
| 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. | Hours | $41.94 | 15 | $629.10 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 13 | $381.42 |
| Pipe, PVC, 24 in., PS 46 | 1254 | Pipe, PVC, PS 46, 24 inch Diameter - ASTM F679. Material cost only. | Each | $33.01 | 6 | $198.06 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 443 | $859.42 |
| 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 | $2.35 | 118 | $277.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 351 - Well Decommissioning

**Scenario:** #1 - Hand Dug

**Scenario Description:**

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

**Feature Measure:** Length of well casing

**Scenario Unit:** Feet

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $896.31

**Scenario Cost/Unit:** $44.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $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. | Hours | $31.29 | 1 | $31.29 |
| Grout pump | 1334 | Grout pump with tremie pipe. Equipment and power unit costs. Labor not included. | Hours | $22.82 | 1 | $22.82 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 1 | $30.06 |
| **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 Yards | $479.47 | 1 | $479.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 1 | $4.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 351 - Well Decommissioning

**Scenario:** #2 - Drilled >100ft

**Scenario Description:**

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 subsidense. Typical length of well casing is greater than 100 feet. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $1,456.63

**Scenario Cost/Unit:** $4.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 1 | $31.29 |
| Grout pump | 1334 | Grout pump with tremie pipe. Equipment and power unit costs. Labor not included. | Hours | $22.82 | 1 | $22.82 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 1 | $30.06 |
| **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 Yards | $479.47 | 2.2 | $1,054.83 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 1 | $4.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 351 - Well Decommissioning

**Scenario:** #3 - Drilled <=100 ft

**Scenario Description:**

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 subsidense. Typical length of well casing is 100 feet or less. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $751.81

**Scenario Cost/Unit:** $751.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 1 | $31.29 |
| Grout pump | 1334 | Grout pump with tremie pipe. Equipment and power unit costs. Labor not included. | Hours | $22.82 | 1 | $22.82 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 1 | $30.06 |
| **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 Yards | $479.47 | 0.73 | $350.01 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 1 | $4.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 355 - Groundwater 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.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $59.34

**Scenario Cost/Unit:** $59.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $47.11 | 1 | $47.11 |

**Practice:** 355 - Groundwater 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.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $242.17

**Scenario Cost/Unit:** $242.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $47.11 | 1 | $47.11 |
| 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 | $182.83 | 1 | $182.83 |

**Practice:** 355 - Groundwater 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.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $293.05

**Scenario Cost/Unit:** $293.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| **Materials** | | | | | | |
| 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 | $50.16 | 1 | $50.16 |
| 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 | $230.66 | 1 | $230.66 |

**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 indundation 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.

**Feature Measure:** Cubic Yards of Earthmoving

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4,444.0

**Scenario Total Cost:** $22,280.88

**Scenario Cost/Unit:** $5.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 5036 | $21,503.72 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 592 | $526.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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'

**Feature Measure:** Total Storage Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 492,128.0

**Scenario Total Cost:** $75,713.53

**Scenario Cost/Unit:** $0.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 2778 | $11,862.06 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 8101 | $28,191.48 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 1389 | $1,236.21 |
| 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 Yards | $3.71 | 9125 | $33,853.75 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| **Materials** | | | | | | |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $3.65 | 8 | $29.20 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 360 - Waste Facility Closure

**Scenario:** #1 - Poultry House Soil Remediation

**Scenario Description:**

Remediation of the soil in an abandoned poultry structures previously used for production or to store poultry waste (litter) on an earthen floor. Payment includes all activities associated with structure removal and soil remediation. 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:**

Rainfall and nutrients on the floor of the house pose a risk to surface water from contaminated runoff or to ground water from seepage into the underlying soils.

**After Situation:**

This scenario is based on a 40' wide x 400' long poultry house with 1 foot depth of nutrient laden soil to remediate (16,000 CF). Payment under this scenario includes activities associated with the soil remediation and structure removal. Soil remediation activities in this scenario include removing the first 6 inches of soil beneath the litter floor and mixing wood chips with the remaining 6 inches of soil. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. The soil will be remediated in-situ by mixing in wood chips, at a rate of 33% of the volume of remaining soil, for the purpose of nitrogen sequestration. Shaping and crowning of the soil material on the disturbed area and critical area seeding (342) will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the nutrients in the mixed soil have been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1. Associated practices: Nutrient Management (590), Critical Area Planting (342).

**Feature Measure:** Square feet area remediated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 16,000.0

**Scenario Total Cost:** $13,678.53

**Scenario Cost/Unit:** $0.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 380 | $1,322.40 |
| 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. | Hours | $107.06 | 25 | $2,676.50 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $126.17 | 19 | $2,397.23 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 1 | $49.78 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 82 | $3,923.70 |
| Front End Loader, 185 HP | 1619 | Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included. | Hours | $106.25 | 6 | $637.50 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 1 | $25.22 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 25 | $751.50 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 16 | $188.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 3 | $750.84 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 2 | $955.70 |

**Practice:** 360 - Waste Facility Closure

**Scenario:** #2 - Feedlot Closure

**Scenario Description:**

Remediation of the soil on an abandoned feedlot previously used to feed animals on a bare earthen lot. Payment includes activities associated with soil remediation of the feedlot area. 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:**

The feedlot is abandoned. Vegetation has not been reestablished. Rainfall and nutrients on the bare earth feedlot pose a risk to surface water from contaminated runoff or to ground water from seepage into the underlying soils.

**After Situation:**

This scenario is based on a 3 acre feedlot. Surveys and testing have determined the manure pack and contaminated soil is 12 inches. Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include, but are not limited to, removing the nutrient enriched manure pack and soil, an average of 12 inches below the existing surface (130,680 CF). The excavated surface will be vegetated with a mix of salt tolerant plants in conformance with Critical Area Planting, Code 342. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the soil has been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1. Associated practices: Nutrient Management (590), Critical Area Planting (342).

**Feature Measure:** Square feet of closure

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 130,680.0

**Scenario Total Cost:** $40,113.25

**Scenario Cost/Unit:** $0.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 40 | $4,282.40 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $126.17 | 269 | $33,939.73 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 40 | $1,202.40 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 16 | $188.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 360 - Waste Facility Closure

**Scenario:** #3 - Demolition of Concrete Waste Storage Structure, Walls >6 ft

**Scenario Description:**

Demolition of a concrete waste storage structure. Payment includes all materials and labor to demolish the structure, remove the concrete and earth fill 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 environmentally 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)

**Feature Measure:** Square Feet of structure (plan view

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $8,271.72

**Scenario Cost/Unit:** $2.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 667 | $2,848.09 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 133 | $1,494.92 |
| 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 | $0.29 | 3990 | $1,157.10 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 4 | $1,001.12 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**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 environmentally 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 (12,100 square feet), 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)

**Feature Measure:** Square feet of Structure

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 12,100.0

**Scenario Total Cost:** $10,876.48

**Scenario Cost/Unit:** $0.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 249 | $527.88 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 588 | $2,510.76 |
| 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. | Hours | $107.06 | 12 | $1,284.72 |
| 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 Yards | $1.40 | 940 | $1,316.00 |
| 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 Feet | $0.21 | 17056 | $3,581.76 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 4 | $1,001.12 |

**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 environmentally 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)

**Feature Measure:** Cubic feet of berm removed

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 25,400.0

**Scenario Total Cost:** $5,762.42

**Scenario Cost/Unit:** $0.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 470 | $2,006.90 |
| 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. | Hours | $107.06 | 12 | $1,284.72 |
| 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 Yards | $1.40 | 940 | $1,316.00 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 360 - Waste Facility Closure

**Scenario:** #6 - Conversion to Freshwater Structure with Sludge Removal

**Scenario Description:**

This practice scenario is for the conversion of an earthen liquid waste impoundment (embankment or excavated type) to a freshwater impoundment where the site needs retrofitting to serve as a freshwater impoundment. Payment includes removal and spreading of manure sludge and the removal of contaminated soil at the soil/sludge interface, construction/excavation of stormwater diversions and principle spillway, and the removal of the waste transfer pipe and appurtanences as required to convert 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 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 environmentally 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 change or remove the stormwater diversions and provide stable principal spillway for the impoundment is approximattely 10% of the structural volume. All inflow devices and associated appurtenances will be removed and properly disposed of. 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)

**Feature Measure:** Cubic feet of sludge removed

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 12,700.0

**Scenario Total Cost:** $6,456.08

**Scenario Cost/Unit:** $0.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 235 | $498.20 |
| 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. | Hours | $107.06 | 12 | $1,284.72 |
| 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 Feet | $0.21 | 17056 | $3,581.76 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 4 | $47.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 3 | $750.84 |

**Practice:** 360 - Waste Facility Closure

**Scenario:** #18 - Demolition of Concrete Waste Storage Structure, Walls <= 6 Foot

**Scenario Description:**

Demolition of a concrete waste storage structure. Payment includes all materials and labor to demolish the structure, remove the concrete and earth fill 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 environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a concrete waste storage structure, with plan view dimensions of 40 ft x 16 ft with 5 ft vertical walls. The walls are 8 inches thick and the concrete floor is 5 inches thick. The total structural storage volume equals 3,200 cubic feet. The total volume of concrete to be demolished is 883 cubic feet. The volume of earthwork (earth fill 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).

**Feature Measure:** Square Feet of Structure (plan view

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $3,112.28

**Scenario Cost/Unit:** $4.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 60 | $256.20 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 33 | $370.92 |
| 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 | $0.29 | 660 | $191.40 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 4 | $1,001.12 |

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

**Feature Measure:** Length of Diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $3,176.08

**Scenario Cost/Unit:** $3.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 700 | $623.00 |
| 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 Yards | $2.17 | 1000 | $2,170.00 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

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

**Feature Measure:** Length of Diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $6,698.08

**Scenario Cost/Unit:** $6.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 1000 | $890.00 |
| 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 Yards | $2.17 | 2500 | $5,425.00 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

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

**Feature Measure:** Length of Diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $9,046.08

**Scenario Cost/Unit:** $9.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 1200 | $1,068.00 |
| 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 Yards | $2.17 | 3500 | $7,595.00 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 362 - Diversion

**Scenario:** #6 - Concrete Curb

**Scenario Description:**

A reinforced concrete (RC) curb constructed across the slope to divert runoff away from farmsteads, gullies, critical erosion areas, construction areas, agricultural waste system, other sensitive areas, or to a waste storage facility. Outlet may be a waterway, underground outlet, or other suitable outlet. Typical 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long with a 2.0 ft wide footing and requires approximately 0.056 CY of RC per linear ft. The curb will be placed on 6" of compacted sand. Concrete diversion is necessary due to limited footprint availability.

**Before Situation:**

Excessive 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. Also, contaminated lot runoff that needs to be diverted to a waste storage facility so it doesn't pollute surface water or ground water.

**After Situation:**

The 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long. "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. Polluted water is diverted to a waste storage facility for proper storage. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Waste Storage Facility (313).

**Feature Measure:** Length of concrete diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,679.68

**Scenario Cost/Unit:** $33.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 2.8 | $1,365.73 |
| 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 Yards | $2.12 | 2.15 | $4.56 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 3.7 | $20.39 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 1.85 | $54.28 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 366 - Anaerobic Digester

**Scenario:** #1 - Anaerobic Digester

**Scenario Description:**

An anaerobic digester can be part of a waste management system. It provides biological treatment of the waste in the absence of oxygen. This process for manure and other by-products of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a generic anaerobic digester. Energy generation is not included with this scenario. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

**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. 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. 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 is each.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,251,015.74

**Scenario Cost/Unit:** $1,251,015.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 2 | $218.50 |
| **Equipment Installation** | | | | | | |
| Anaerobic Digester | 2478 | Concrete 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 operation, piping and collection system for biogas, controls for operating digester and boiler system, boiler needed to maintain digester temperature, and flare excess gas to convert from methane to carbon dioxide. Includes material, labor, and equipment. | Each | $1,250,000.00 | 1 | $1,250,000.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**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 environmentally 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 fexible 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).

**Feature Measure:** Animals Units Contributing to Diges

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $287,843.89

**Scenario Cost/Unit:** $287.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Anaerobic Digester Gas Collection and Flare System | 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 | $287,415.25 | 1 | $287,415.25 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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".

**Feature Measure:** Roof Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $12,319.39

**Scenario Cost/Unit:** $12.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $12.00 | 1000 | $12,000.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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".

**Feature Measure:** Roof Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 7,500.0

**Scenario Total Cost:** $89,794.39

**Scenario Cost/Unit:** $11.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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, equipment, and installation. Does not include foundation preparation. | Square Feet | $11.93 | 7500 | $89,475.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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".

**Feature Measure:** Roof Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 24,000.0

**Scenario Total Cost:** $174,799.39

**Scenario Cost/Unit:** $7.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Steel Frame Monoslope Building, greater than 60' wide | 1677 | Steel Frame Monoslope Building, greater than 60' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Feet | $7.27 | 24000 | $174,480.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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".

**Feature Measure:** Roof Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 7,500.0

**Scenario Total Cost:** $104,792.48

**Scenario Cost/Unit:** $13.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 29 | $14,145.04 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 10 | $538.50 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $12.47 | 5 | $62.35 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 10 | $252.20 |
| **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, equipment, and installation. Does not include foundation preparation. | Square Feet | $11.93 | 7500 | $89,475.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**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.

**Feature Measure:** Surface Area of Facility Covered

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 43,560.0

**Scenario Total Cost:** $199,966.97

**Scenario Cost/Unit:** $4.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 287 | $52,354.54 |
| 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 Yards | $2.12 | 717 | $1,520.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 430 | $1,836.10 |
| **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. | Hours | $31.49 | 960 | $30,230.40 |
| 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. | Hours | $41.94 | 120 | $5,032.80 |
| **Materials** | | | | | | |
| Synthetic Liner, 60 mil | 2109 | Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Feet | $1.38 | 58564 | $80,818.32 |
| 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 shipping only. | Feet | $14.75 | 1880 | $27,730.00 |
| **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 | $69.11 | 4 | $276.44 |
| 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 | $168.33 | 1 | $168.33 |

**Practice:** 367 - Roofs and Covers

**Scenario:** #7 - Permeable Composite or Inorganic Cover

**Scenario Description:**

A permeable floating composite cover is deployed on the liquid surface of a waste storage or treatment facility. Permeable covers reduce radiation and wind velocity over the surface of a liquid storage to reduce transmission of odors and act as a medium for growth of microorganisms that utilize carbon, nitrogen, and sulfur to decompose odorous compounds. 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. 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 applied to the liquid surface of a waste storage or treatment facility. Installation of the permeable modular cover will improve air quality by reducing emissions of odors and ammonia. 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. The typical waste storage structure has a liquid surface area of 7,000 square feet.

**Feature Measure:** Storage Surface Area at Normal Full

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 7,000.0

**Scenario Total Cost:** $21,128.92

**Scenario Cost/Unit:** $3.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 2 | $99.56 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| **Materials** | | | | | | |
| Composite Cover, floating cover, > 5,000 square feet | 1860 | Composite material that is used to cover open storages with an area greater than 5,000 sf. Example, Hexa-Cover. Materials only. | Square Feet | $2.99 | 7000 | $20,930.00 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario:** #5 - In-House Composting

**Scenario Description:**

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow. The cause of mortatiy is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**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, or interaction with predators. No plan was formulated for 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. The typical scenario number of birds to be disposed of is 20,000, 4 pound birds which can be composted in-house. Composting requires 1.5 pounds of carbon per pound of bird. There is 0.5 pounds of litter per bird already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling birds and litter in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/litter mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining litter; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $7,926.51

**Scenario Cost/Unit:** $99.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 28 | $1,507.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 91 | $4,354.35 |
| **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. | Hours | $24.46 | 28 | $684.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 28 | $706.16 |
| **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 | $168.33 | 4 | $673.32 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario:** #6 - Burial

**Scenario Description:**

This scenario consists of the on-site burial of animal mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

**Before Situation:**

Animal mortality disposal 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 catastrophic mortality events.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed 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, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be re-compacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $2,396.35

**Scenario Cost/Unit:** $95.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 94 | $327.12 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 12 | $597.36 |
| 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 Yards | $1.57 | 94 | $147.58 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 12 | $302.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario:** #57 - Outside Windrow Composting

**Scenario Description:**

This scenario consists the emergency disposal of a large number of livestock mortality by composting in a static windrow. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**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, or interaction with predators.

**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. This typical scenario was developed based on the composting of 20 head of cattle averaging 1000 pound each which are moved to a location on-site that is suitable for composting. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building an turning of the pile at the appropriate time. Composting requires 1.5 pounds of carbon per pound of animal. A small volume of green manure or waste feed is available on site. Wood chips (45 pcf) will be used as the carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 1 add'l laborer: 1) collecting and transporting carcasses to compost site; 2) constructing compost windrow base using carbon material; 3) place carcasses 4) cover carcasses with green manure/waste feed; 4) cover with carbon material; 5) cap windrow with any remaining manure/feed; 6) after first heat cycle turn the windrow over and reconstruct for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $14,696.64

**Scenario Cost/Unit:** $734.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 55 | $2,737.90 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 148 | $7,081.80 |
| **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. | Hours | $24.46 | 55 | $1,345.30 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 55 | $1,387.10 |
| 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. | Hours | $41.94 | 18 | $754.92 |
| **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 | $69.11 | 2 | $138.22 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 5 | $1,251.40 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario:** #58 - Forced Air Incineration

**Scenario Description:**

This scenario consists the emergency disposal of a large number of livestock by a portable forced air incinerator. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**Before Situation:**

Animal mortality disposal 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.

**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. This typical scenario was developed based on the forced air incineration of the carcasses of 50 head of cattle averaging 1000 pound each. The scenario includes equipment time and labor to recover and transport carcasses to a suitable on-site incineration location and the rental and operation of a portable forced air incinerator. Wood fuel is also added to assist with the incineration process. The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $13,692.14

**Scenario Cost/Unit:** $273.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 50 | $2,489.00 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 42 | $2,009.70 |
| Incinerator, Portable, Trench Burner | 2712 | A portable incinerator used with the development of a trench to incinerate animal carcasses or other debris | Week | $1,163.33 | 2 | $2,326.66 |
| **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. | Hours | $24.46 | 50 | $1,223.00 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 94 | $2,370.68 |
| 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. | Hours | $41.94 | 56 | $2,348.64 |
| **Materials** | | | | | | |
| Fuel, propane | 1597 | 20 pound propane bottle, with propane, for ignition of prescribed burns. Materials only. | Each | $9.42 | 45 | $423.90 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario:** #123 - Disposal At Landfill or Render

**Scenario Description:**

This scenario consists of the disposal of animal mortality carcasses by landfilling or rendering resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal 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 catastrophic mortality events.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, 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, and protection from predators to minimize pathogen survival or spreading. An overall plan covers disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 700 finisher swine carcasses at an average weight of 200 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport the carcasses to the landfill which is within a 1.5 hour drive of the farm.

**Feature Measure:** Pounds of mortality

**Scenario Unit:** Pound

**Scenario Typical Size:** 140,000.0

**Scenario Total Cost:** $9,156.85

**Scenario Cost/Unit:** $0.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 5 | $269.25 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $57.62 | 39 | $2,247.18 |
| **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. | Hours | $24.46 | 5 | $122.30 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 39 | $1,172.34 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.08 | 3388 | $271.04 |
| Landfill Fee, Animal Carcass | 2711 | Fees charged by a landfill for proper disposal of animal carcass or animal debris | Cubic Yards | $48.88 | 91 | $4,448.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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).

**Feature Measure:** Number of Biofilters Installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $17,835.23

**Scenario Cost/Unit:** $17,835.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 10 | $3,673.60 |
| 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 Yards | $487.76 | 11.3 | $5,511.69 |
| 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 Yards | $2.12 | 33 | $69.96 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 24 | $1,148.40 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 6 | $146.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 11 | $337.70 |
| Pipe, PE, 3/4 in., DR 9 | 996 | Materials: - 3/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $0.39 | 50 | $19.50 |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 0.25 | $88.48 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Feet | $0.94 | 80 | $75.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $307.65 | 1 | $307.65 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.64 | 36 | $59.04 |
| 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. | Feet | $0.32 | 100 | $32.00 |
| Articulated precast concrete planking, 5 Foot Wide block | 1906 | Articulated precast concrete blocks with a typical thickness of 4.5 inches. Includes materials only. | Square Feet | $7.76 | 320 | $2,483.20 |
| Pipe, PVC, 24 in., SCH 40 | 2046 | Materials: - 24 inch - PVC - SCH 40 - ASTM D1785 | Feet | $59.32 | 40 | $2,372.80 |
| **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 | $69.11 | 1 | $69.11 |
| 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 | $168.33 | 1 | $168.33 |

**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.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,565.93

**Scenario Cost/Unit:** $1,565.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 3 | $94.47 |
| **Materials** | | | | | | |
| Fan, exhaust, 48 in. High Efficiency | 1187 | 48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only. | Each | $1,471.46 | 1 | $1,471.46 |

**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 appurtanences and labor to install.

**Before Situation:**

Inefficent 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.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $924.32

**Scenario Cost/Unit:** $231.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **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 | $168.10 | 4 | $672.40 |

**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:**

Inefficent 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.

**Feature Measure:** Square Foot

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 520.0

**Scenario Total Cost:** $11,077.84

**Scenario Cost/Unit:** $21.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 96 | $3,023.04 |
| **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 90 square feet. Includes material only. | Square Feet | $15.49 | 520 | $8,054.80 |

**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.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,681.34

**Scenario Cost/Unit:** $4,681.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **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 | $4,429.42 | 1 | $4,429.42 |

**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, appurtanences 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $2,880.83

**Scenario Cost/Unit:** $576.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 4 | $125.96 |
| **Materials** | | | | | | |
| Scroll Compressor - 5 HP | 1183 | Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only. | Each | $2,754.87 | 1 | $2,754.87 |

**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.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,556.70

**Scenario Cost/Unit:** $4,556.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **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 | $4,304.78 | 1 | $4,304.78 |

**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 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $833.88

**Scenario Cost/Unit:** $833.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Variable Speed Drive, 1 HP | 2347 | Variable speed drive for 1 Horsepower electric motor. Does not include motor. Materials only. | Each | $581.96 | 1 | $581.96 |

**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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $1,523.17

**Scenario Cost/Unit:** $304.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Variable Speed Drive, 5 HP | 2348 | Variable speed drive for 5 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $254.25 | 5 | $1,271.25 |

**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 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,196.02

**Scenario Cost/Unit:** $219.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Variable Speed Drive, 10 HP | 1287 | Variable speed drive for 10 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $194.41 | 10 | $1,944.10 |

**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 appurtances, 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $10,102.92

**Scenario Cost/Unit:** $101.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Variable Speed Drive, 100 HP | 1289 | Variable speed drive for 100 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $98.51 | 100 | $9,851.00 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #11 - Controller - Multi-Function, Single Environmental Condition

**Scenario Description:**

The typical scenario consists of a multiple function automatic control system to manage a single environmental condition installed on an existing manually controlled agricultural building control system. Environmental conditions are defined by the following: lighting, temperature, humidity and/or air quality. The controller will control a combination of the following devices to achieve single or multiple environmental condition control: fans, lights, curtains, dampers, heaters, sprinklers (cooling), etc. 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.

**Feature Measure:** Each system

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,673.97

**Scenario Cost/Unit:** $1,673.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| 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 | $579.54 | 1 | $579.54 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $307.65 | 1 | $307.65 |
| 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 | $786.78 | 1 | $786.78 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #12 - Controller - Multi-Function, Multiple Environmental Condition

**Scenario Description:**

The typical scenario consists of a multiple function automatic control system to manage multiple environmental conditions installed on an existing manually controlled agricultural building control system. Environmental conditions are defined by the following: lighting, temperature, humidity and/or air quality. The controller will control a combination of the following devices to achieve single or multiple environmental condition control: fans, lights, curtains, dampers, heaters, sprinklers (cooling), etc. 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.

**Feature Measure:** Each system

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,856.41

**Scenario Cost/Unit:** $3,856.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| 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 | $579.54 | 4 | $2,318.16 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $307.65 | 5 | $1,538.25 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #13 - Motor - <= 1 HP Electric Motor Upgrade

**Scenario Description:**

Replacement of an existing electric motor with a upgraded electric motor typically used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The upgraded electric motor will be the same size as the existing less efficient motor it is replacing. This scenario is for motors <=1 horsepower. Payment includes motor, appurtenances and labor to install.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $576.99

**Scenario Cost/Unit:** $576.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 4 | $125.96 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 1 HP | 1169 | Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $451.03 | 1 | $451.03 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #14 - Motor - > 1 to <10 HP Electric Motor Upgrade

**Scenario Description:**

Replacement of an existing electric motor with a upgraded electric motor typically used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The upgraded electric motor will be the same size as the existing less efficient motor it is replacing. This scenario is for motors ranging from >1 horsepower to <10 horsepower. Payment includes motor, appurtanences and labor to install.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $735.33

**Scenario Cost/Unit:** $147.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 4 | $125.96 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 5 HP | 1171 | Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $609.37 | 1 | $609.37 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #15 - Motor - 10 - <50 HP Electric Motor Upgrade

**Scenario Description:**

Replacement of an existing electric motor with a upgraded electric motor typically used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The upgraded electric motor will be the same size as the existing less efficient motor it is replacing. This scenario is for motors ranging from 10 horsepower to <50 horsepower. Payment includes motor, appurtanences and labor to install.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,136.96

**Scenario Cost/Unit:** $113.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 10 HP | 1172 | Premium NEMA approved electric motor, 10 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $885.04 | 1 | $885.04 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #16 - Motor - >= 50 HP Electric Motor Upgrade

**Scenario Description:**

Replacement of an existing electric motor with a upgraded electric motor typically used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The upgraded electric motor will be the same size as the existing less efficient motor it is replacing. This scenario is for motors of 50 horsepower or greater. Payment includes motor, appurtenances and labor to install.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $8,948.29

**Scenario Cost/Unit:** $89.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 100 HP | 1174 | Premium NEMA approved electric motor, 100 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $8,444.45 | 1 | $8,444.45 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #17 - Motor - Variable Speed Electric (Split Phase)

**Scenario Description:**

Installation of a multi speed electric motor typically used to drive a ventilation fan in a livestock production house. Payment includes motor and labor to install. Control panel is not included. Refer to associated control panel scenarios as needed.

**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 multi speed electric motor. After the motor is installed, 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.

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $253.50

**Scenario Cost/Unit:** $253.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 3 | $94.47 |
| **Materials** | | | | | | |
| Motor, electric, Multi Speed, 10 HP | 1154 | Multi speed electric motor, 10 Horsepower maximum output and all required appurtenances. Materials only. | Horsepower | $159.03 | 1 | $159.03 |

**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 sytems 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 convential 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.

**Feature Measure:** Rated Heat Output

**Scenario Unit:** 1,000 BTU/Hour

**Scenario Typical Size:** 125.0

**Scenario Total Cost:** $1,505.54

**Scenario Cost/Unit:** $12.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| **Materials** | | | | | | |
| Heater, radiant tube | 1163 | Radiant tube heater rated at 125,000 BTU/hour. Materials only. | Each | $1,442.56 | 1 | $1,442.56 |

**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.

**Feature Measure:** Rated Heat Output

**Scenario Unit:** 1,000 BTU/Hour

**Scenario Typical Size:** 750.0

**Scenario Total Cost:** $12,818.84

**Scenario Cost/Unit:** $17.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| **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 | $16.42 | 750 | $12,315.00 |

**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 ventiliation fans are being operated in poultry houses and swine barns. In certain situlations 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 cirulated 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.

**Feature Measure:** Each inlet

**Scenario Unit:** Each

**Scenario Typical Size:** 14.0

**Scenario Total Cost:** $2,742.78

**Scenario Cost/Unit:** $195.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 24 | $755.76 |
| **Materials** | | | | | | |
| Inlet, Attic Ceiling | 2414 | Poultry house attic air inlets. Includes materials only. | Each | $141.93 | 14 | $1,987.02 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #21 - Grain Dryer

**Scenario Description:**

A more efficient replacement continuous dryer rated for the present dryer bushel/per hour capacity to treat existing energy concerns. Grain dryer rated capacity for the removal of 10 points moisture from corn per ASABE S248. The operation includes a microcomputer-based control system that adjusts the amount of time the crop remains in the dryer in order to achieve a consistent and accurate moisture content in the dried product. Alternate types of replacement dryers which reduce energy use are acceptable as defined by the energy audit. The upgraded grain dryer will be the same size as the existing less efficient grain dryer it is replacing. Payment includes materials and labor needed for the installation.

**Before Situation:**

Current grain dryer identified in the Agricultural Energy Management Plan is inefficient.

**After Situation:**

Energy use is reduced through installation of a more efficient continuous dryer that uses a microcomputer-based controller to reduce over drying and total time of operation. The typical operation requires a rated capacity of 860 bushels per hour. 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.

**Feature Measure:** Rated capacity of the dryer for 10 p

**Scenario Unit:** Bushel per Hour

**Scenario Typical Size:** 860.0

**Scenario Total Cost:** $139,741.28

**Scenario Cost/Unit:** $162.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Grain dryer, Axial, 12 ft. | 1158 | Grain dryer, 12 foot Axial with rated capacity of 460 bushels/hour. Materials only. | Bushel per Hour | $188.35 | 172 | $32,396.20 |
| Grain dryer, Axial, 16 ft. | 1159 | Grain dryer, 16 foot Axial with rated capacity of 600 bushels/hour. Materials only. | Bushel per Hour | $157.42 | 172 | $27,076.24 |
| Grain dryer, Centrifugal, 20 ft. | 1160 | Grain dryer, 20 foot Centrifugal with rated capacity of 785 bushels/hour. Materials only. | Bushel per Hour | $168.04 | 172 | $28,902.88 |
| Grain dryer, Centrifugal, 24 ft. | 1161 | Grain dryer, 24 foot Centrifugal with rated capacity of 860 bushels/hr. Materials only. | Bushel per Hour | $137.59 | 172 | $23,665.48 |
| Grain dryer, Axial 28 ft. | 1162 | Grain dryer, 28 foot Axial with rated capacity of 990 bushels/hr. Materials only. | Bushel per Hour | $158.12 | 172 | $27,196.64 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #67 - Controller - Single Function

**Scenario Description:**

The typical scenario consists of a single function controller with built in sensors for automatic on-off control that can be powered by a typical 120V electrical outlet. Controller does not typically include any communication link, data logging or wi-fi capabilities. The controller is typically installed on an existing manually controlled agricultural system including, but not limited to, building ventilation systems.

**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 regulate the energy consumption of the existing system. Associated practices/activities may include: 128-AgEMP, 670 - Lighting System Improvement, 672 - Building envelope Improvement, and other activities within 374 - Farmstead Energy Improvement. The new controller is connected to the existing system and controls when the equipment is on or off. The resource concern of Inefficient Energy Use - Equipment and Facilities will be addressed with this practice by operating the equipment only when needed and therefore saving energy.

**Feature Measure:** each contoller

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $174.57

**Scenario Cost/Unit:** $174.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Temperature Sensors | 2462 | Sensor used to measure and communicate temperature to the controlling mechanism in a refrigeration system. Includes materials and shipping only. | Each | $125.65 | 1 | $125.65 |

**Practice:** 374 - Farmstead Energy Improvement

**Scenario:** #79 - Ventilation - Heat Recovery System

**Scenario Description:**

Heat recovery system to recover thermal energy from contaminated and dirty exhaust air in poultry barns. Includes all the automation, controls, and monitoring equipment resulting in a self-sufficient operating unit/system. Each system is designed to operate 4,000 square feet of poultry production space, and provides 4,000 cfm of ventilation. Associated practices: 128 Ag Energy Management Plan.

**Before Situation:**

Heat is being exhausted from the production facility through the ventilation system and lost.

**After Situation:**

Exhaust heat is recovered and reused thereby reducing heating energy costs for the production facility.

**Feature Measure:** each unit

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $10,000.00

**Scenario Cost/Unit:** $10,000.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Heat Recovery System, Ventilation | 2701 | Difference in costs of ownership and operation between existing mobile agricultural IC systems >160 bhp with no emissions reduction technology or early-generation emissions reduction technology and new mobile agricultural IC systems >160 bhp with latest-tier emissions reduction technology. | Each | $10,000.00 | 1 | $10,000.00 |

**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.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,100.0

**Scenario Total Cost:** $9,010.76

**Scenario Cost/Unit:** $2.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 20 | $110.20 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 56 | $5,747.28 |
| 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. | Hours | $107.06 | 4 | $428.24 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 60 | $1,803.60 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.58 | 20 | $131.60 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 80 | $93.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**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.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $22,300.98

**Scenario Cost/Unit:** $4.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 20 | $110.20 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 8 | $821.04 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 78 | $15,789.54 |
| 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. | Hours | $17.20 | 78 | $1,341.60 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 86 | $2,585.16 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.58 | 100 | $658.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 3 | $750.84 |

**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.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 8,000.0

**Scenario Total Cost:** $37,288.90

**Scenario Cost/Unit:** $4.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 29 | $159.79 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 12 | $1,231.56 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 124 | $25,101.32 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| 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. | Hours | $17.20 | 124 | $2,132.80 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 144 | $4,328.64 |
| **Materials** | | | | | | |
| Pipe, PVC, 10 in., SCH 80 | 1351 | Materials: - 10 inch - PVC - SCH 80 - ASTM D1785 | Feet | $22.67 | 100 | $2,267.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 3 | $750.84 |

**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.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 11,000.0

**Scenario Total Cost:** $54,748.96

**Scenario Cost/Unit:** $4.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 29 | $159.79 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 24 | $2,463.12 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 170 | $34,413.10 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| 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. | Hours | $17.20 | 170 | $2,924.00 |
| **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. | Hours | $24.46 | 30 | $733.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 208 | $6,252.48 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 16 | $469.44 |
| Pipe, Steel, 18 in., Std Wt, USED | 1358 | Materials: - USED - 18 inch - Steel Std Wt | Feet | $47.14 | 120 | $5,656.80 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 3 | $750.84 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #1 - 3 row windbreak, containerized planting stock

**Scenario Description:**

Three or more rows of containerized trees, shrubs or a combination of trees and shrubs are 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 and shrubs is installed by hand planting trees 20 ft apart and shubs 6 ft apart with 16' between rows. 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.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $2,762.98

**Scenario Cost/Unit:** $5.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 8 | $91.76 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.3 | $96.63 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.3 | $97.67 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Shrub, Potted, Medium | 1527 | Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $13.67 | 84 | $1,148.28 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $14.60 | 25 | $365.00 |
| Tree, Conifer, Potted, Medium | 1537 | Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $13.76 | 25 | $344.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 134 | $16.08 |
| 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 | $0.54 | 134 | $72.36 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #2 - 3 row windbreak, containerized planting stock, temporary irrigation

**Scenario Description:**

Three or more rows of containerized trees, shrubs or a combination of trees and shrubs are 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, a temporary irrigation system to aid in establishment, and foregone income for land removed from crop production where windbreak is installed. Tree planting in an area where supplemental water is needed for successful establishment. Generally these areas would be considered arid or drought stricken, but other factors may contribute to requiring supplemental water. 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. The area generally includes arid or droughty conditions that greatly reduce the success of tree survival.

**After Situation:**

A windbreak of containerized trees and shrubs is installed by hand planting trees 20 ft apart and shubs 6 ft apart with 16' between rows. 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. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $3,980.82

**Scenario Cost/Unit:** $7.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 8 | $91.76 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.3 | $96.63 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.3 | $97.67 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Shrub, Potted, Medium | 1527 | Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $13.67 | 84 | $1,148.28 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $14.60 | 25 | $365.00 |
| Tree, Conifer, Potted, Medium | 1537 | Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $13.76 | 25 | $344.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 134 | $16.08 |
| 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 | $0.54 | 134 | $72.36 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 16000 | $1,120.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #3 - 3 row windbreak, bareroot seedling planting stock

**Scenario Description:**

Three or more rows of bare-root trees, shrubs or a combination of trees and shrubs are 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 tomachine 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 and shrubs is installed by machine planting trees 10 ft apart and shubs 5 ft apart with 16' between rows. 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.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $641.34

**Scenario Cost/Unit:** $1.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 2 | $45.24 |
| 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. | Hours | $5.83 | 2 | $11.66 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.3 | $96.63 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.3 | $97.67 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.67 | 100 | $67.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 50 | $76.00 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.86 | 50 | $43.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 200 | $24.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #4 - 3 row windbreak, bareroot seedling planting stock, temporary irrigation

**Scenario Description:**

Three or more rows of bare-root trees, shrubs or a combination of trees and shrubs are 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 tomachine the stock, a temporary irrigation system to aid in establishment, and foregone income for land removed from crop production where windbreak is installed. Tree planting in an area where supplemental water is needed for successful establishment. Generally these areas would be considered arid or drought stricken, but other factors may contribute to requiring supplemental water. 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. The area generally includes arid or droughty conditions that greatly reduce the success of tree survival.

**After Situation:**

A windbreak of bare-root trees and shrubs is installed by machine planting trees 10 ft apart and shubs 5 ft apart with 16' between rows. 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. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,859.18

**Scenario Cost/Unit:** $3.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 2 | $45.24 |
| 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. | Hours | $5.83 | 2 | $11.66 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.3 | $96.63 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.3 | $97.67 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.67 | 100 | $67.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 50 | $76.00 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.86 | 50 | $43.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 200 | $24.00 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 16000 | $1,120.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #9 - 1 row windbreak, bareroot trees

**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 tomachine 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.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $218.98

**Scenario Cost/Unit:** $0.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 0.5 | $11.84 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 0.5 | $11.31 |
| 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. | Hours | $5.83 | 0.5 | $2.92 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| 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. | Hours | $41.94 | 0.5 | $20.97 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 50 | $76.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 50 | $6.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #10 - 1 row windbreak, bareroot trees with temporary irrigation

**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 tomachine the stock, a temporary irrigation system to aid in establishment, and foregone income for land removed from crop production where windbreak is installed. Tree planting in an area where supplemental water is needed for successful establishment. Generally these areas would be considered arid or drought stricken, but other factors may contribute to requiring supplemental water. 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. The area generally includes arid or droughty conditions that greatly reduce the success of tree survival.

**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. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $278.44

**Scenario Cost/Unit:** $0.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 0.5 | $11.84 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 0.5 | $11.31 |
| 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. | Hours | $5.83 | 0.5 | $2.92 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 1.5 | $36.69 |
| 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. | Hours | $41.94 | 0.5 | $20.97 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 50 | $76.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 50 | $6.00 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 500 | $35.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #11 - 1 row windbreak, bareroot shrubs

**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 tomachine 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 shubs 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.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $275.24

**Scenario Cost/Unit:** $0.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 1 | $22.62 |
| 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. | Hours | $5.83 | 1 | $5.83 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.67 | 100 | $67.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 100 | $12.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #12 - 1 row windbreak, bareroot shrubs with temporary irrigation

**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 tomachine the stock, a temporary irrigation system to aid in establishment, and foregone income for land removed from crop production where windbreak is installed. Tree planting in an area where supplemental water is needed for successful establishment. Generally these areas would be considered arid or drought stricken, but other factors may contribute to requiring supplemental water. 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. The area generally includes arid or droughty conditions that greatly reduce the success of tree survival.

**After Situation:**

A windbreak of bare-root shrubs is installed by machine planting shubs 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. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $334.70

**Scenario Cost/Unit:** $0.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 1 | $22.62 |
| 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. | Hours | $5.83 | 1 | $5.83 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.67 | 100 | $67.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 100 | $12.00 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 500 | $35.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #30 - 1 row windbreak, container trees, less than 2 gallons

**Scenario Description:**

One row of containerized hardwood and/or conifer trees planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. 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 15 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.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $483.86

**Scenario Cost/Unit:** $0.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 2 | $22.94 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 3 | $73.38 |
| 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. | Hours | $41.94 | 1.5 | $62.91 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 17 | $132.26 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 17 | $97.07 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 34 | $4.08 |
| 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 | $0.54 | 25 | $13.50 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #31 - 1 row windbreak, container shrubs, less than 2 gallon

**Scenario Description:**

One row of containerized shrubs planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. 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.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,132.81

**Scenario Cost/Unit:** $2.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 7 | $80.29 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 7 | $171.22 |
| 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. | Hours | $41.94 | 5 | $209.70 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 84 | $538.44 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 84 | $10.08 |
| 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 | $0.54 | 84 | $45.36 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #33 - 1 row windbreak, container shrubs, less than 2 gallon with temporary irrigation

**Scenario Description:**

One row of containerized shrubs planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. 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, a temporary irrigation system to aid in establishment, and foregone income for land removed from crop production where windbreak is installed. Tree planting in an area where supplemental water is needed for successful establishment. Generally these areas would be considered arid or drought stricken, but other factors may contribute to requiring supplemental water. 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. The area generally includes arid or droughty conditions that greatly reduce the success of tree survival.

**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. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,374.03

**Scenario Cost/Unit:** $2.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 7 | $80.29 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 14 | $342.44 |
| 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. | Hours | $41.94 | 5 | $209.70 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 84 | $538.44 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 84 | $10.08 |
| 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 | $0.54 | 84 | $45.36 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 1000 | $70.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario:** #34 - 1 row windbreak, container trees, less than 2 gallon with termporary irrigation

**Scenario Description:**

One row of containerized hardwood and/or conifer trees planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. 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, a temporary irrigation system to aid in establishment, and foregone income for land removed from crop production where windbreak is installed. Tree planting in an area where supplemental water is needed for successful establishment. Generally these areas would be considered arid or drought stricken, but other factors may contribute to requiring supplemental water. 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. The area generally includes arid or droughty conditions that greatly reduce the success of tree survival.

**After Situation:**

A windbreak of containerized trees is installed by hand planting trees 15 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. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $643.57

**Scenario Cost/Unit:** $1.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 3 | $34.41 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| 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. | Hours | $41.94 | 1.5 | $62.91 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 17 | $132.26 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 17 | $97.07 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 34 | $4.08 |
| 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 | $0.54 | 34 | $18.36 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 1000 | $70.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #13 - Bareroot Trees and Shrubs, with Tree Shelters

**Scenario Description:**

Bare-root trees and/or shrubs to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant. Foregone income is not included with this scenario. 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:**

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

**After Situation:**

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

**Feature Measure:** each tree/shrub established

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $3,745.07

**Scenario Cost/Unit:** $7.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 17 | $194.99 |
| **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. | Hours | $24.46 | 59 | $1,443.14 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 500 | $760.00 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials only. | Each | $1.72 | 500 | $860.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 1000 | $60.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $0.77 | 500 | $385.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #14 - Bareroot Trees and Shrubs

**Scenario Description:**

Bare-root trees and/or shrubs to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant. Foregone income is not included with this scenario. 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:**

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

**After Situation:**

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

**Feature Measure:** Per Tree/Shrub planted

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,412.75

**Scenario Cost/Unit:** $2.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 17 | $194.99 |
| **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. | Hours | $24.46 | 17 | $415.82 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 500 | $760.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #26 - Container Trees and Shrubs, less than 2 gallon with tree shelters

**Scenario Description:**

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes container trees/shrubs, tree shelters, and equipment and labor to plant. Foregone income is not included with this scenario. 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:**

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

**After Situation:**

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

**Feature Measure:** each tree/shrub

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $9,510.78

**Scenario Cost/Unit:** $19.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 42 | $481.74 |
| **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. | Hours | $24.46 | 84 | $2,054.64 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 500 | $3,890.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $3.71 | 500 | $1,855.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 1000 | $60.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.50 | 500 | $750.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #27 - Container Trees and Shrubs, less than 2 gallon

**Scenario Description:**

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes container trees/shrubs and equipment and labor to plant. Foregone income is not included with this scenario. 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:**

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

**After Situation:**

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

**Feature Measure:** each tree/shrub

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $5,818.46

**Scenario Cost/Unit:** $11.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 42 | $481.74 |
| **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. | Hours | $24.46 | 42 | $1,027.32 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 500 | $3,890.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #29 - Bareroot Trees and Shrubs with Tree Protection

**Scenario Description:**

Bare-root trees and/or shrubs to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant plus the installation of wire cage tree shelters around each tree for protection from grazing animals. This is a standard forestry technique to improve tree/shrub survival during the establishment phase. Shelters will be monitored by the client, repaired as needed, and removed when trees are sufficiently established. Foregone income is not included with this scenario. 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. Resource concerns addressed are Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition; Soil Erosion – Wind erosion, Sheet and rill erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

**Before Situation:**

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, snow, etc.) available to the livestock. The site does not optimize opportunities for conservation benefits including soil protection, wildlife habitat, and carbon capture/storage provided by trees.

**After Situation:**

Trees have been planted on the site, providing shade, wind, and snow protection to livestock and wildlife, and benefitting soil, water, and carbon sequestration. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres and each tree is protected with a wire cage tree shelter covering a 4 ft diameter area around the tree, to be removed when trees are established. All Resource Concerns listed above are addressed.

**Feature Measure:** Per Tree/Shrub Planted

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $16,966.53

**Scenario Cost/Unit:** $33.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 17 | $194.99 |
| **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. | Hours | $24.46 | 100 | $2,446.00 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $234.18 | 20 | $4,683.60 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 1500 | $8,190.00 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.10 | 6500 | $650.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 500 | $760.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #30 - Container Trees and Shrubs, less than 2 gallon with Tree Protection

**Scenario Description:**

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Payment includes container trees/shrubs and equipment and labor to plant plus the installation of wire cage tree shelters around each tree for protection from grazing animals. This is a standard forestry technique to improve tree/shrub survival during the establishment phase. Shelters will be monitored by the client, repaired as needed, and removed when trees are sufficiently established. Foregone income is not included with this scenario. 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. Resource concerns addressed are Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition; Soil Erosion – Wind erosion, Sheet and rill erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

**Before Situation:**

A pasture with suitable forage for livestock; however, there is very little protection from the elements (sun, wind, snow etc.) available to the livestock. The site does not optimize opportunities for conservation benefits including soil protection, wildlife habitat, and carbon capture/storage provided by trees.

**After Situation:**

Trees have been planted on the site, providing shade, wind, and snow protection to livestock and wildlife, and benefitting soil, water, and carbon sequestration. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres and each tree is protected with a wire cage tree shelter covering a 4 ft diameter area around the tree, to be removed when trees are established. All Resource Concerns listed above are addressed..

**Feature Measure:** Per Tree/Shrub Planted

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $21,372.24

**Scenario Cost/Unit:** $42.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 42 | $481.74 |
| **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. | Hours | $24.46 | 125 | $3,057.50 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| **Materials** | | | | | | |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $234.18 | 20 | $4,683.60 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 1500 | $8,190.00 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.10 | 6500 | $650.00 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 500 | $3,890.00 |

**Practice:** 381 - Silvopasture

**Scenario:** #31 - Container Trees and Shrubs, 2 gallon and larger with Tree Protection

**Scenario Description:**

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Payment includes container seedlings and equipment and labor to plant plus the installation of wire cage tree shelters around each tree for protection from grazing animals. This is a standard forestry technique to improve tree/shrub survival during the establishment phase. Shelters will be monitored by the client, repaired as needed, and removed when trees are sufficiently established. Foregone income is not included with this scenario. 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. Resource concerns addressed are Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition; Soil Erosion – Wind erosion, Sheet and rill erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

**Before Situation:**

A pasture with suitable forage for livestock; however, there is very little protection from the elements (sun, wind, snow etc.) available to the livestock. The site does not optimize opportunities for conservation benefits including soil protection, wildlife habitat, and carbon capture/storage provided by trees.

**After Situation:**

Trees have been planted on the site, providing shade, wind, and snow protection to livestock and wildlife, and benefitting soil, water, and carbon sequestration. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres and each tree is protected with a wire cage tree shelter covering a 4 ft diameter area around the tree, to be removed when trees are established. All Resource Concerns listed above are addressed.

**Feature Measure:** Per Tree/Shrub Planted

**Scenario Unit:** Each

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $24,782.24

**Scenario Cost/Unit:** $49.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 42 | $481.74 |
| **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. | Hours | $24.46 | 125 | $3,057.50 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| **Materials** | | | | | | |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $234.18 | 20 | $4,683.60 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 1500 | $8,190.00 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.10 | 6500 | $650.00 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $14.60 | 500 | $7,300.00 |

**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

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $2,986.74

**Scenario Cost/Unit:** $2.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 12 | $149.64 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 12 | $284.04 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 12 | $271.44 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $69.11 | 5 | $345.55 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 68 | $485.52 |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $12.09 | 4 | $48.36 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.19 | 1320 | $250.80 |
| Gate, Pipe, 16 ft. | 1059 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $227.69 | 1 | $227.69 |
| **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 | $168.33 | 2 | $336.66 |

**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 ekectric fence with 2-3 wires with wooden post of 50' centers, battens between the post, single H brace assembles, 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

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $2,129.26

**Scenario Cost/Unit:** $1.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 6 | $74.82 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 6 | $135.72 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| **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 | $110.43 | 2 | $220.86 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 29 | $207.06 |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $12.09 | 4 | $48.36 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $350.15 | 1 | $350.15 |
| 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. | Feet | $0.07 | 1320 | $92.40 |
| Gate, Pipe, 16 ft. | 1059 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $227.69 | 1 | $227.69 |
| **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 | $168.33 | 2 | $336.66 |

**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

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $1,435.43

**Scenario Cost/Unit:** $1.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 3 | $37.41 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 3 | $71.01 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 3 | $67.86 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| **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 | $110.43 | 1 | $110.43 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 24 | $171.36 |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $12.09 | 4 | $48.36 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $10.70 | 4 | $42.80 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.10 | 4 | $8.40 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $8.40 | 1 | $8.40 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $9.43 | 1 | $9.43 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $350.15 | 1 | $350.15 |
| 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. | Feet | $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 | $168.33 | 2 | $336.66 |

**Practice:** 382 - Fence

**Scenario:** #5 - Permanent High Tensile, Minimum 4 Strand, Double H bracing

**Scenario Description:**

Establishment of permanent electric or non-electric high tensile fence for livestock. Fence is designed using minimum of 4 strands and 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 a minimum of 4 wires with wooden posts, double H brace assembles as called for by site conditions, 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.

**Feature Measure:** Length of fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $3,296.03

**Scenario Cost/Unit:** $2.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 15 | $187.05 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 10 | $236.70 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 15 | $339.30 |
| **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. | Hours | $24.46 | 25 | $611.50 |
| **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 | $110.43 | 2 | $220.86 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 87 | $621.18 |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $12.09 | 6 | $72.54 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $350.15 | 1 | $350.15 |
| 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. | Feet | $0.07 | 1320 | $92.40 |
| Gate, Pipe, 16 ft. | 1059 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $227.69 | 1 | $227.69 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** 382 - Fence

**Scenario:** #6 - Permanent High Tensile, Minimum 4 Strand, Single H brace

**Scenario Description:**

Establishment of permanent electric or non-electric high tensile fence for livestock. Fence is designed using minimum of 4 strands and 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 a minimum of 4 wires with wooden posts, single H brace assembles, 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.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $2,623.08

**Scenario Cost/Unit:** $1.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 8 | $99.76 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 8 | $180.96 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **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 | $110.43 | 2 | $220.86 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 68 | $485.52 |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $12.09 | 4 | $48.36 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $350.15 | 1 | $350.15 |
| 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. | Feet | $0.07 | 1320 | $92.40 |
| Gate, Pipe, 16 ft. | 1059 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $227.69 | 1 | $227.69 |
| **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 | $168.33 | 2 | $336.66 |

**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

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $3,436.30

**Scenario Cost/Unit:** $2.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 12 | $149.64 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 12 | $271.44 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $69.11 | 1 | $69.11 |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $234.18 | 4 | $936.72 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 65 | $464.10 |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $12.09 | 6 | $72.54 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.10 | 1320 | $132.00 |
| Gate, Pipe, 16 ft. | 1059 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $227.69 | 1 | $227.69 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** 382 - Fence

**Scenario:** #8 - Temporary/Portable Fence

**Scenario Description:**
Establishment of temporary or portable fence for livestock to facilitate a more intensive grazing system such as stockpiling or stripgrazing.

**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:**
Consists of installing a single strand polywire/polytape fence with step in/fiberglass posts on 50' centers, solar energizer, 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

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $653.01

**Scenario Cost/Unit:** $0.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 2 | $99.90 |
| Post, Fiberglass, 11/16 in. X 6 ft. | 19 | Fiberglass line post, 11/16 in. diameter X 6 ft. length. Includes materials and shipping only. | Each | $7.08 | 26 | $184.08 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |

**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 wilidlife habitat. Resouce 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 sensative areas will promote saftey for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 450.0

**Scenario Total Cost:** $2,406.00

**Scenario Cost/Unit:** $5.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 5 | $62.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 5 | $118.35 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 5 | $113.10 |
| **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. | Hours | $24.46 | 15 | $366.90 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 12 | $302.64 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $69.11 | 1 | $69.11 |
| Wire, Woven, Galvanized, 12.5 Gauge, 32 in | 3 | Galvanized 12.5 gauge, 32 inch - 330 foot roll. Includes materials and shipping only. | Each | $150.10 | 2 | $300.20 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 8 | $57.12 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $16.70 | 13 | $217.10 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 43 | $234.78 |
| Gate, Pipe, 16 ft. | 1059 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $227.69 | 1 | $227.69 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** 382 - Fence

**Scenario:** #10 - Temporary - Portable for Small Livestock

**Scenario Description:**

Establishment of temporary or portable fence for small livestock to facilitate a more intensive grazing system such as stockpiling or stripgrazing.

**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:**

Consists of installing a prefabricated fence that has 10 horizontal twines; is 42 in. tall installed, and has plastic vertical struts every 12",solar energizer, 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

**Feature Measure:** Length of fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $2,586.63

**Scenario Cost/Unit:** $1.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| **Materials** | | | | | | |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Wire, Electric Netting, 42 in. | 2382 | Electric netting, 42 inches tall, 10 horizontal strands, vertical struts every 12 inches, single spike. Material only. | Feet | $1.68 | 1320 | $2,217.60 |

**Practice:** 386 - Field Border

**Scenario:** #14 - Field Border, Native Species, Forgone Income

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of native 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:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established in the field borders 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.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $487.70

**Scenario Cost/Unit:** $487.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 1 | $111.33 |

**Practice:** 386 - Field Border

**Scenario:** #15 - Field Border, Introduced Species, Forgone Income

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced 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:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established for the field border 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.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $346.34

**Scenario Cost/Unit:** $346.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | -2 | ($60.98) |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 20 | $7.80 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 1 | $30.75 |

**Practice:** 386 - Field Border

**Scenario:** #16 - Field Border, Pollinator, Forgone Income

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. 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:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may 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.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $835.15

**Scenario Cost/Unit:** $835.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**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.

**Feature Measure:** Acres of Riparian Herbaceous Cover

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $471.39

**Scenario Cost/Unit:** $471.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 1 | $111.33 |

**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 intermittant flooding and saturated soils where the exising 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.

**Feature Measure:** Acres of Riparian Herbaceous Cover

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $818.84

**Scenario Cost/Unit:** $818.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**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. 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.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $5,875.02

**Scenario Cost/Unit:** $1,175.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 5 | $52.00 |
| 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. | Acres | $11.75 | 5 | $58.75 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 2.5 | $805.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 2.5 | $813.90 |
| **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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Trees and shrubs, seed | 1871 | Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only. | Pound | $8.78 | 400 | $3,512.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario:** #2 - Bareroot trees and shrubs

**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 machine planted bare-root shrubs and 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.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $6,431.92

**Scenario Cost/Unit:** $1,286.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 2 | $45.24 |
| 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. | Hours | $5.83 | 2 | $11.66 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 2.5 | $805.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 2.5 | $813.90 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 1210 | $1,706.10 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 1744 | $2,650.88 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 393 - Filter Strip

**Scenario:** #14 - Filter Strip, Introduced species, Forgone Income

**Scenario Description:**

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species. The area of the filter strip is taken out of 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 393 Implementation Requirements are developed for the site and applied. 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 seed. 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.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $492.02

**Scenario Cost/Unit:** $492.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 1.5 | $31.05 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 20 | $7.80 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |

**Practice:** 393 - Filter Strip

**Scenario:** #15 - Filter Strip, Native species, Forgone Income

**Scenario Description:**

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species. The area of the filter strip is taken out of 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 393 Implementation Requirements are developed for the site and applied. 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 seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on the contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $566.47

**Scenario Cost/Unit:** $566.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 3 | $31.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 1.5 | $31.05 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Medium Density | 2751 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $159.05 | 1 | $159.05 |

**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.

**Feature Measure:** Length of firebreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $220.87

**Scenario Cost/Unit:** $0.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 2 | $20.80 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 2 | $31.74 |
| **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 | $168.33 | 1 | $168.33 |

**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.

**Feature Measure:** Length of firebreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $457.92

**Scenario Cost/Unit:** $0.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1.4 | $7.95 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1.4 | $9.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1.4 | $29.88 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| **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 | $0.44 | 30 | $13.20 |
| 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 | $0.39 | 60 | $23.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 60 | $19.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| 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. | Acres | $9.21 | 1.4 | $12.89 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 1.4 | $43.05 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 394 - Firebreak

**Scenario:** #6 - Constructed - Handline

**Scenario Description:**

Installation of a bare-ground firebreak of a minimum width of 5' around a 20 acre woodland burn unit with the dominant fuel being hardwood leaf litter. 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. The firebreak will be installed with handtools such as broom rakes and/or leaf blowers. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

**Before Situation:**

Field lacks adequate firebreaks to contain a prescribed burn. Fuel, weather, and/or topgraphic conditions do not warrant the use of heavy equipment.

**After Situation:**

The property can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

**Feature Measure:** <Unknown>

**Scenario Unit:** Feet

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $460.32

**Scenario Cost/Unit:** $0.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 12 | $84.00 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 4 | $82.80 |
| **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. | Hours | $24.46 | 12 | $293.52 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario:** #1 - Riparian Zone Improvement, Forested

**Scenario Description:**

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forested riparian zone plant communities. The planned activity meets the 395 standard, and facilitating practice standards, especially Codes 390 and 391, utilized in combination to satisfy all requirements specific to habitats needed for the stream and riparian species for which the practice is being implemented. Implementation will improve instream and riparian habitat complexity, water quality, hiding and resting cover, and/or increased food availability for desired riparian and stream species.

**Before Situation:**

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements. The site does not have adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter andor large woody material for stream species food and cover. The site's riparian vegetation is compromised by human activities and/or access of vehicles, people, and/or livestock is not controlled adequately to protect riparian functions and stream habitat quality. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be reduced due to compaction. Riparian vegetation quality and/or quantity is compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components.

**After Situation:**

Revegetation/reforestation of the riparian zone is completed and the vegetation community is under close management to insure long-term survival and ecological succession of the plant community. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation thru shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat for terrestrial insects and other riparian-dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $7,779.92

**Scenario Cost/Unit:** $3,889.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 16 | $500.64 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 8 | $432.32 |
| **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. | Hours | $24.46 | 40 | $978.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| 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. | Hours | $41.94 | 24 | $1,006.56 |
| **Materials** | | | | | | |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $14.97 | 200 | $2,994.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 200 | $304.00 |
| Tree shelter, wire mesh | 1557 | 5 feet tall, Woven Wire mesh, 6"x 6" opening or smaller, 10 gauge wire (minimum) , cage placed around seedling for animal protection. Materials only. | Each | $1.71 | 200 | $342.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario:** #2 - Instream wood placement

**Scenario Description:**

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing logs, root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Per Structure

**Scenario Unit:** Each

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $11,476.41

**Scenario Cost/Unit:** $573.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $128.05 | 16 | $2,048.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 8 | $616.96 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| **Materials** | | | | | | |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $14.97 | 300 | $4,491.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 10 | $665.30 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.62 | 50 | $31.00 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $163.19 | 10 | $1,631.90 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.02 | 40 | $400.80 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario:** #3 - Instream rock placement

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

**Feature Measure:** Per Structure

**Scenario Unit:** Each

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $12,739.21

**Scenario Cost/Unit:** $636.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $128.05 | 16 | $2,048.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 8 | $616.96 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| **Materials** | | | | | | |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $14.97 | 300 | $4,491.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 60 | $3,991.80 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario:** #4 - Rock and wood structures

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large wood and rock structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring one acre of stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing logs, rocks, or constructing wood and rock structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Per Structure

**Scenario Unit:** Each

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $15,477.67

**Scenario Cost/Unit:** $773.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $128.05 | 24 | $3,073.20 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 8 | $616.96 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 32 | $961.92 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| **Materials** | | | | | | |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $14.97 | 300 | $4,491.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 40 | $2,661.20 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.62 | 8 | $4.96 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $163.19 | 10 | $1,631.90 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.02 | 30 | $300.60 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario:** #5 - Wood with Lunkers

**Scenario Description:**

This scenario involves placement of large wood (root wads) and lunkers (overhang/undercut bank structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood and undercut bank habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing a series of root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Bankfull width x reach length

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,781.58

**Scenario Cost/Unit:** $6,781.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 15 | $1,605.90 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 15 | $1,156.80 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 30 | $901.80 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners. | Board Feet | $0.78 | 360 | $280.80 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 30 | $1,083.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 5 | $332.65 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.62 | 25 | $15.50 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.02 | 20 | $200.40 |
| **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 | $477.85 | 1 | $477.85 |

**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.

**Feature Measure:** Linear Feet of Low Head Dam and A

**Scenario Unit:** Feet

**Scenario Typical Size:** 85.0

**Scenario Total Cost:** $34,469.79

**Scenario Cost/Unit:** $405.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $309.40 | 1.5 | $464.10 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 20 | $2,052.60 |
| 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. | Hours | $128.05 | 60 | $7,683.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 60 | $3,231.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $187.27 | 4 | $749.08 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 80 | $6,169.60 |
| 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 | $0.29 | 9200 | $2,668.00 |
| **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. | Hours | $31.49 | 80 | $2,519.20 |
| 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. | Hours | $24.46 | 60 | $1,467.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 160 | $4,809.60 |
| 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. | Hours | $41.94 | 40 | $1,677.60 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**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.

**Feature Measure:** CMP

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,971.30

**Scenario Cost/Unit:** $4,971.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 96 | $528.96 |
| 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. | Hours | $128.05 | 6 | $768.30 |
| **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. | Hours | $31.49 | 4 | $125.96 |
| 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. | Hours | $24.46 | 6 | $146.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **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 | $0.99 | 2600 | $2,574.00 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $25.00 | 4 | $100.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #1 - Embankment 4in-6in Pipe

**Scenario Description:**

An earthen embankment dam with a principal spillway pipe (PVC or Steel) of 6 inches or less with antiseep collars. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 5,000 cubic yards (including core trench backfill), and 100 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412), will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $22,229.70

**Scenario Cost/Unit:** $4.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 20 | $110.20 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 8 | $821.04 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 78 | $15,789.54 |
| 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. | Hours | $17.20 | 78 | $1,341.60 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 86 | $2,585.16 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.58 | 100 | $658.00 |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 50 | $179.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #2 - Embankment 8in-12in Pipe

**Scenario Description:**

An earthen embankment dam with a principal spillway pipe (PVC or Steel) of 8" to 12" with antiseep collars. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 8000 cubic yards(including core trench backfill), and 100 feet of pipe 10" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 8,000.0

**Scenario Total Cost:** $37,227.27

**Scenario Cost/Unit:** $4.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 29 | $159.79 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 12 | $1,231.56 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 124 | $25,101.32 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| 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. | Hours | $17.20 | 124 | $2,132.80 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 144 | $4,328.64 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 72 | $257.76 |
| Pipe, PVC, 10 in., SCH 80 | 1351 | Materials: - 10 inch - PVC - SCH 80 - ASTM D1785 | Feet | $22.67 | 100 | $2,267.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #3 - Embankment >12in

**Scenario Description:**

An earthen embankment dam with a principle spillway pipe greater than12 inches with anti-seep collars or sand diaphragm. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 11,000 cubic yards (including core trench backfill), 120 feet of 18" Steel pipe with a canopy inlet, and 16 cubic yard sand diaphragm with outlet. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 11,000.0

**Scenario Total Cost:** $54,568.60

**Scenario Cost/Unit:** $4.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 29 | $159.79 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 24 | $2,463.12 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 170 | $34,413.10 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| 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. | Hours | $17.20 | 170 | $2,924.00 |
| **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. | Hours | $24.46 | 30 | $733.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 202 | $6,072.12 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 16 | $469.44 |
| Pipe, Steel, 18 in., Std Wt, USED | 1358 | Materials: - USED - 18 inch - Steel Std Wt | Feet | $47.14 | 120 | $5,656.80 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 3 | $750.84 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #4 - Embankment Tile Conduit

**Scenario Description:**

An earthen embankment dam with a 6" HDPE corrugated plastic tubing principal spillway conduit. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 3100 cubic yards (including core trench backfill), and 80 feet of 6" CPT with a plastic inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as: Fence (382), Grassed Waterway (412), Water and Sediment Control Basin (638) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,100.0

**Scenario Total Cost:** $9,010.76

**Scenario Cost/Unit:** $2.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 20 | $110.20 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 56 | $5,747.28 |
| 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. | Hours | $107.06 | 4 | $428.24 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 60 | $1,803.60 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.58 | 20 | $131.60 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 80 | $93.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #6 - Pipe Drop, Smooth Steel or CMP, <1000 CY Earthfill

**Scenario Description:**

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a sand diaphragm. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel or corrugated metal pipe drop structure with 600 CY of earthfill, a 36", 12' tall riser and a 100' long 24" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 100ft = 942). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Riser Weir Length x Barrel Length

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 942.0

**Scenario Total Cost:** $13,154.84

**Scenario Cost/Unit:** $13.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 1.4 | $514.30 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 600 | $2,562.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 100 | $551.00 |
| 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. | Hours | $107.06 | 4 | $428.24 |
| **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. | Hours | $31.49 | 11 | $346.39 |
| 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. | Hours | $24.46 | 10 | $244.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 36 | $1,056.24 |
| Steel, Plate, 3/16 in. | 1048 | Flat Steel Plate, 3/16 inch thick, materials only. | Square Feet | $5.37 | 16 | $85.92 |
| Pipe, Steel, 24 in., Std Wt, USED | 1360 | Materials: - USED - 24 inch - Steel Std Wt | Feet | $50.20 | 100 | $5,020.00 |
| Pipe, Steel, 36 in., Std Wt, USED | 1362 | Materials: - USED - 36 inch - Steel Std Wt | Feet | $120.14 | 12 | $1,441.68 |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $3.52 | 10 | $35.20 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $10.73 | 3 | $32.19 |
| 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 Feet | $1.62 | 288 | $466.56 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #7 - Full Flow Straight Pipe

**Scenario Description:**

A full flow straight pipe grade stabilization structure. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the diameter of the pipe in inches times the length of the pipe in feet. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a PVC or corrugated metal pipe, 12" in diameter, 60' long. (diameter x pipe length = 12in x 60ft = 720). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** pipe diameter x pipe length

**Scenario Unit:** Diameter Inch Foot

**Scenario Typical Size:** 720.0

**Scenario Total Cost:** $4,106.73

**Scenario Cost/Unit:** $5.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 425 | $1,814.75 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 74 | $407.74 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 4 | $243.44 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Pipe, PVC, 12 in., SDR 35 | 1252 | Pipe, PVC, SDR 35, 12 inch Diameter - ASTM D3034. Material cost only. | Feet | $17.91 | 60 | $1,074.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #8 - Open Flow Drop Spillway

**Scenario Description:**

A Straight or semicircular drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Feet of Weir length times Drop Hei

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 90.0

**Scenario Total Cost:** $14,382.52

**Scenario Cost/Unit:** $159.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 9 | $4,389.84 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 13 | $16.90 |
| 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 Yards | $2.12 | 40 | $84.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 400 | $1,708.00 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| **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. | Hours | $31.49 | 85 | $2,676.65 |
| 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. | Hours | $24.46 | 30 | $733.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 3 | $92.10 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 11 | $397.10 |
| Corrugated Steel, 12 Gauge, galvanized | 1376 | Corrugated Steel, 12 gauge, 3 inch by 1 inch corrugations, galvanized, meets ASTM A 929. Materials only. | Square Feet | $10.59 | 275 | $2,912.25 |
| Pipe, CMP, 12 in., 14 Gauge | 1377 | 12 inch - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only. | Feet | $11.92 | 2 | $23.84 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #9 - Rock Rip Rap Chute

**Scenario Description:**

A full flow chute structure with rip rap, geotextile fabric, and earthfill/earthmoving. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 90 cfs (20' BW, 5:1 Chute Slope, 5' Drop, 18" rock thickness). Amount of rock required is 86 CY (129 tons). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of rip rap installed

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 86.0

**Scenario Total Cost:** $6,608.68

**Scenario Cost/Unit:** $76.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 197 | $256.10 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 100 | $427.00 |
| 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. | Hours | $107.06 | 6 | $642.36 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 129 | $4,656.90 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #10 - Grouted Rock Rip Rap Chute

**Scenario Description:**

A full flow chute structure with grouted rip rap, geotextile fabric, and earthfill/earthmoving. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is absed upon typical amount of rock of 46 cubic yards of grouted rip rap. Typical Chute has 10' BW, 6' Drop, with 3" of Grout, 70 CFS capacity. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of rip rap installed

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 46.0

**Scenario Total Cost:** $5,396.06

**Scenario Cost/Unit:** $117.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 9 | $1,641.78 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 107 | $139.10 |
| 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. | Hours | $107.06 | 6 | $642.36 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 65 | $2,346.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #11 - Gabion Chute

**Scenario Description:**

A full flow chute structure with rock filled gabion baskets, geotextile fabric, and earthfill/earthmoving. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute with 12' BW, 4:1 chute slope, 6' drop to handle design flow of 100 cfs. 25 CY of gabion baskets. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover.Cost data is applicable to organic and convention agricultural production systems.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of gabion baskets

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $7,398.23

**Scenario Cost/Unit:** $295.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 85 | $110.50 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 200 | $854.00 |
| 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. | Hours | $107.06 | 12 | $1,284.72 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 12 | $1,154.76 |
| Gabion basket or mat | 1378 | Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric. | Cubic Yards | $135.33 | 25 | $3,383.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #12 - Geotextile Reinforced Vegetated Outlet

**Scenario Description:**

A full flow chute structure with geotextile fabric, erosion control blanket, riprap outlet and earthfill/earthmoving. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 50 cfs (16' BW, 6:1 Chute Slope, 6' Drop). Amount of geotextile required is 1050 SF. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Square Ft of Geotextile lined area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,050.0

**Scenario Total Cost:** $2,736.44

**Scenario Cost/Unit:** $2.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 163 | $211.90 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 100 | $427.00 |
| 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. | Hours | $107.06 | 6 | $642.36 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 17 | $613.70 |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.32 | 163 | $215.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #13 - Open Flow Drop Spillway-High overfall or sheet pile

**Scenario Description:**

A straight drop structure used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a sheet pile structure with a weir length of 35', Weir notch height of 2' and drop of 4' with a total capacity of 335 cfs. The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Feet of Weir length times Drop Hei

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 140.0

**Scenario Total Cost:** $37,561.79

**Scenario Cost/Unit:** $268.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 165 | $214.50 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 400 | $1,708.00 |
| 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. | Hours | $128.05 | 16 | $2,048.80 |
| Sheet piling, steel, 15' | 1337 | Steel sheet pile, panels or barrier driven up to 15 feet and left in place. Includes materials, equipment and labor. | Square Feet | $30.14 | 838 | $25,257.32 |
| Rock Riprap, grouted | 1757 | Grouted Rock Riprap, placed, includes materials, equipment and labor to transport and place. | Cubic Yards | $130.89 | 45 | $5,890.05 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 16 | $480.96 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 42 | $1,516.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #15 - Concrete Drop Structure

**Scenario Description:**

A Straight or Box Drop structure composed of reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a concrete box drop structure with a drop of 4ft and weir length of 16ft. The unit of payment measurement is cubic yards of concrete placed. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yard of Concrete

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 12.0

**Scenario Total Cost:** $10,799.95

**Scenario Cost/Unit:** $900.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 12 | $5,853.12 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 20 | $26.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 300 | $1,281.00 |
| 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. | Hours | $128.05 | 8 | $1,024.40 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 3 | $92.10 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 50 | $1,805.00 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #16 - Concrete Block Chute

**Scenario Description:**

A full flow chute structure with concrete blocks, geotextile fabric, and earthfill/earthmoving. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon typical chute designed to handle 65 cfs (10' BW, 5' Drop). 518 Concrete blocks required. Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Cost data is applicable to organic and convention agricultural production systems.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Square feet of concrete block lined

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 460.0

**Scenario Total Cost:** $4,988.12

**Scenario Cost/Unit:** $10.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 52 | $67.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 300 | $1,281.00 |
| 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. | Hours | $107.06 | 6 | $642.36 |
| **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. | Hours | $24.46 | 45 | $1,100.70 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 9 | $264.06 |
| Block, concrete | 253 | Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only | Each | $2.32 | 518 | $1,201.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario:** #33 - Pipe Drop, Smooth Steel or CMP, >1000 CY Earthfill

**Scenario Description:**

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a sand diaphragm. This is typically an earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel or corrugated metal pipe drop structure with 2500 CY of earthfill, a 36", 12' tall riser and a 100' long 24" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 100ft = 942). Disturbed areas and earthfill surfaces are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Riser Weir Length x Barrel Length

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 942.0

**Scenario Total Cost:** $23,670.24

**Scenario Cost/Unit:** $25.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 1.4 | $514.30 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 2500 | $10,675.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 100 | $551.00 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| **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. | Hours | $31.49 | 30 | $944.70 |
| 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. | Hours | $24.46 | 60 | $1,467.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 36 | $1,056.24 |
| Steel, Plate, 3/16 in. | 1048 | Flat Steel Plate, 3/16 inch thick, materials only. | Square Feet | $5.37 | 16 | $85.92 |
| Pipe, Steel, 24 in., Std Wt, USED | 1360 | Materials: - USED - 24 inch - Steel Std Wt | Feet | $50.20 | 100 | $5,020.00 |
| Pipe, Steel, 36 in., Std Wt, USED | 1362 | Materials: - USED - 36 inch - Steel Std Wt | Feet | $120.14 | 12 | $1,441.68 |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $3.52 | 10 | $35.20 |
| 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 Feet | $1.62 | 328 | $531.36 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #1 - <35 foot top width

**Scenario Description:**

Typical practice is 1 acre, 30' topwidth, 8:1 side slopes, 1.25' depth, 55% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 30' topwidth, 8:1 side slopes, 1.25' depth. The practice is installed using a dozer. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,043.33

**Scenario Cost/Unit:** $3,043.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 369.5 | $580.12 |
| 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 Yards | $3.71 | 369.5 | $1,370.85 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #2 - 35-55 foot top width

**Scenario Description:**

Typical practice is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth, 50% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth. The practice is installed using a dozer. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,225.49

**Scenario Cost/Unit:** $3,225.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 404 | $634.28 |
| 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 Yards | $3.71 | 404 | $1,498.84 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #3 - >55 foot top width

**Scenario Description:**

Typical practice is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth, 50% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth. The practice is installed using a dozer. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,933.01

**Scenario Cost/Unit:** $3,933.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 538 | $844.66 |
| 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 Yards | $3.71 | 538 | $1,995.98 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #4 - <35 foot top width with checks

**Scenario Description:**

Typical practice is 1 acre, 30' topwidth, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 30' topwidth, 8:1 side slopes, 1.5' depth. Checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,459.66

**Scenario Cost/Unit:** $4,459.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 369.5 | $580.12 |
| 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 Yards | $3.71 | 369.5 | $1,370.85 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 14 | $1,347.22 |
| 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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #5 - 35-55 foot top width with checks

**Scenario Description:**

Typical practice is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth. Checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,831.64

**Scenario Cost/Unit:** $4,831.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 403.5 | $633.50 |
| 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 Yards | $3.71 | 403.5 | $1,496.99 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 16 | $1,539.68 |
| 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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #6 - >55 foot top width with checks

**Scenario Description:**

Typical practice is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth. Checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,445.57

**Scenario Cost/Unit:** $5,445.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 538 | $844.66 |
| 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 Yards | $3.71 | 538 | $1,995.98 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 15 | $1,443.45 |
| 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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #7 - <35 foot top width, crop season construction

**Scenario Description:**

Typical practice is 1 acre, 30' topwidth, 8:1 side slopes, 1.25' depth, 55% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Foregone income reflects entire construction area to account for crop loss while constructing during the growing season.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 30' topwidth, 8:1 side slopes, 1.25' depth. The practice is installed using a dozer. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,690.98

**Scenario Cost/Unit:** $3,690.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 369.5 | $580.12 |
| 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 Yards | $3.71 | 369.5 | $1,370.85 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.5 | $483.14 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.5 | $488.34 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #8 - <35 foot top width with checks, crop season construction

**Scenario Description:**

Typical practice is 1 acre, 30' topwidth, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Foregone income reflects entire construction area to account for crop loss while constructing during the growing season.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 30' topwidth, 8:1 side slopes, 1.5' depth. Checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,107.31

**Scenario Cost/Unit:** $5,107.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 369.5 | $580.12 |
| 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 Yards | $3.71 | 369.5 | $1,370.85 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.5 | $483.14 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.5 | $488.34 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 14 | $1,347.22 |
| 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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #9 - 35-55 foot top width, crop season construction

**Scenario Description:**

Typical practice is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth, 50% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Foregone income reflects entire construction area to account for crop loss while constructing during the growing season.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth. The practice is installed using a dozer. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,873.14

**Scenario Cost/Unit:** $3,873.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 404 | $634.28 |
| 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 Yards | $3.71 | 404 | $1,498.84 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.5 | $483.14 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.5 | $488.34 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #10 - 35-55 foot top width with checks, crop season construction

**Scenario Description:**

Typical practice is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Foregone income reflects entire construction area to account for crop loss while constructing during the growing season.

**Before Situation:**

The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 45' topwidth, 10:1 side slopes, 1.5' depth. Checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,479.29

**Scenario Cost/Unit:** $5,479.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 403.5 | $633.50 |
| 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 Yards | $3.71 | 403.5 | $1,496.99 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.5 | $483.14 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.5 | $488.34 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 16 | $1,539.68 |
| 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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #11 - >55 foot top width, crop season construction

**Scenario Description:**

Typical practice is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth, 50% excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth. The practice is installed using a dozer. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,580.66

**Scenario Cost/Unit:** $4,580.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 538 | $844.66 |
| 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 Yards | $3.71 | 538 | $1,995.98 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.5 | $483.14 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.5 | $488.34 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 412 - Grassed Waterway

**Scenario:** #12 - >55 foot top width with checks, crop season construction

**Scenario Description:**

Typical practice is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1 acre, 60' topwidth, 10:1 side slopes, 2.0' depth. Checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Waterway area is fertilized and seeded for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,093.22

**Scenario Cost/Unit:** $6,093.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 1 | $6.50 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 1 | $8.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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 Yards | $1.57 | 538 | $844.66 |
| 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 Yards | $3.71 | 538 | $1,995.98 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.5 | $483.14 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.5 | $488.34 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 15 | $1,443.45 |
| 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 | $0.44 | 90 | $39.60 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 2 | $32.48 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 422 - Hedgerow Planting

**Scenario:** #1 - 3 row hedgerow, container planting stock

**Scenario Description:**

Three rows of bare-root trees, shrubs or a combination of trees and shrubs are planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to machine plant the stock and foregone income for land removed from crop production where hedgerow 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:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** length of hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $2,113.57

**Scenario Cost/Unit:** $4.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 12 | $137.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.3 | $96.63 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.3 | $97.67 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 100 | $641.00 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 100 | $778.00 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 422 - Hedgerow Planting

**Scenario:** #2 - 1 row hedgerow, container trees planting stock

**Scenario Description:**

One row of container trees planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where hedgerow 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:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** length of hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $643.62

**Scenario Cost/Unit:** $1.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 3 | $34.41 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 3 | $73.38 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 50 | $389.00 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 422 - Hedgerow Planting

**Scenario:** #3 - 1 row hedgerow, container shrubs planting stock

**Scenario Description:**

One row of container shrubs planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to hand plant the stock and foregone income for land removed from crop production where hedgerow 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:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** length of hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,003.41

**Scenario Cost/Unit:** $2.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 6 | $68.82 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 100 | $641.00 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 422 - Hedgerow Planting

**Scenario:** #4 - 3 row hedgerow, bareroot seedling planting stock

**Scenario Description:**

Three rows of bare-root trees, shrubs or a combination of trees and shrubs are planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to machine plant the stock and foregone income for land removed from crop production where hedgerow 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:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** length of hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $737.89

**Scenario Cost/Unit:** $1.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 2 | $45.24 |
| 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. | Hours | $5.83 | 2 | $11.66 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.3 | $96.63 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.3 | $97.67 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.67 | 100 | $67.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 100 | $152.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 422 - Hedgerow Planting

**Scenario:** #5 - 1 row hedgerow, bareroot tree seedling planting stock

**Scenario Description:**

One row of bare-root trees planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to machine plant the stock and foregone income for land removed from crop production where hedgerow 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:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** length of hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $192.78

**Scenario Cost/Unit:** $0.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 0.5 | $11.31 |
| 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. | Hours | $5.83 | 0.5 | $2.92 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 0.5 | $12.61 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 50 | $76.00 |

**Practice:** 422 - Hedgerow Planting

**Scenario:** #6 - 1 row hedgerow, bareroot shrub seedling planting stock

**Scenario Description:**

One row of bare-root shrubs planted for wildlife habitat (corridor), pollinator habitat, reduction of particulate matter, chemical drift, or odor movement, and boundary delineation and contour guidelines. This practice is typically applied on cropland. Trees and/or shrubs will be planted into previously established bunch grasses that produce erect stems greater than 3' in height and will persist over winter. This herbaceous component will be established according to the guidelines in 327 Conservation Cover. Payment includes materials, labor and equipment needed to machine plant the stock and foregone income for land removed from crop production where hedgerow 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:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** length of hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $296.85

**Scenario Cost/Unit:** $0.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 1 | $22.62 |
| 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. | Hours | $5.83 | 1 | $5.83 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.12 | $38.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.12 | $39.07 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 1 | $25.22 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 100 | $141.00 |

**Practice:** 430 - Irrigation Pipeline

**Scenario:** #1 - Microirrigation Pipeline

**Scenario Description:**

Below ground installation of plastic pipeline installed underground between the location of the water pump and the area of irrigation to serve a micro irrigaion system. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included as 10% of pipe material. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Feature Measure:** Ft of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $4,698.10

**Scenario Cost/Unit:** $3.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 1500 | $1,905.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 1109 | $2,151.46 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 430 - Irrigation Pipeline

**Scenario:** #2 - Pipe System <=8 in Diameter, >50 ft Installation

**Scenario Description:**

Below ground installation of plastic pipeline installed underground between the location of the water pump and the area of irrigation to serve an irrigation system. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included as 10% of pipe material. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Feature Measure:** Ft of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $21,379.28

**Scenario Cost/Unit:** $14.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 1500 | $3,945.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 8656 | $16,792.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 430 - Irrigation Pipeline

**Scenario:** #3 - Pipe System <= 8 in Diameter, <= 50 ft Installation

**Scenario Description:**

Below ground installation of plastic pipeline installed underground between the location of the water pump and the area of irrigation to serve an irrigation system. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included as 10% of pipe material. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Feature Measure:** Ft of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,138.12

**Scenario Cost/Unit:** $22.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 50 | $131.50 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 289 | $560.66 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 430 - Irrigation Pipeline

**Scenario:** #4 - Pipe System 10-12 in Diameter, >50 ft Installation

**Scenario Description:**

Below ground installation of plastic pipeline installed underground between the location of the water pump and the area of irrigation to serve an irrigaion system. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included as %10 of pipe material. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Feature Measure:** Ft of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $28,490.22

**Scenario Cost/Unit:** $18.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 1500 | $3,945.00 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 12271 | $23,805.74 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 430 - Irrigation Pipeline

**Scenario:** #5 - Pipe System 10-12 in Diameter, <= 50ft Installation

**Scenario Description:**

Below ground installation of plastic pipeline installed underground between the location of the water pump and the area of irrigation to serve an irrigation system. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included as 10% of pipe material. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Feature Measure:** Ft of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,414.02

**Scenario Cost/Unit:** $28.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 50 | $131.50 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 406 | $787.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 436 - Irrigation Reservoir

**Scenario:** #1 - Underground Tank

**Scenario Description:**

A 1,500 gallon, HDPE plastic tank, is installed below ground to store water from a reliable source for irrigation of a small area. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery, 558 - Roof Runoff Structure

**Before Situation:**

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

**After Situation:**

A 1500 gallon HDPE tank (dimensions: 111"L X 98"W X 48"H) installed 2 ft below ground as a means to store water collected from building/surface runoff and/or irrigation tailwater recovery. Scenario describes excavation of pit, placement of tank and backfilling of material over tank including spreading of spoil.

**Feature Measure:** Volume of Storage Tank

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $2,010.07

**Scenario Cost/Unit:** $1.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 17 | $36.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 4 | $215.40 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $0.67 | 1500 | $1,005.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario:** #1 - Trees and Shrubs Microirrigation System

**Scenario Description:**

An irrigation system for trees and shrubs such as in establishing a windbreak. Water delivery to the plants by surface lines and/or subsurface applicators. Spacing of the plants will vary, w/ delivery lines spaced 15'. Area in question is being converted from other means of less efficient irrigation. Payment includes on-ground mainline and drip tape, fittings, and appurtenances. Pump & supply line is not included in this payment and may be offered through associated practices 533 Pumping plant and 430 Irrigation Pipeline, or existing pump & supply lines will be used. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

**Before Situation:**

A windbreak has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed micro irrigation system is utilized to provide highly efficient irrigation to the trees. Typical system is for 5 rows of trees each 600 ft in length for a total irrigated length of 3,000 feet. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline

**Feature Measure:** Per Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $1,404.90

**Scenario Cost/Unit:** $0.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| 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. | Feet | $0.32 | 3150 | $1,008.00 |
| Micro Irrigation, screen or disc filter, < 3" | 2524 | Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only. | Each | $201.22 | 1 | $201.22 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario:** #2 - Specialty Crop Microirrigation System

**Scenario Description:**

An irrigation system for vegetables or other specialty crops typically of small acerage (2 acre). Water delivery to the plants by surface lines and/or subsurface applicators. Spacing of the plants will vary, w/ lateral lines spaced 24". Area in question is being converted from other means of less efficient irrigation. Payment includes on-ground mainline and drip tape, fittings, and apurtenances. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation, drip tape will be replaced as operation and maintenance as required for proper operation of the system. Pump & supply line is not included in this payment and may be offered through associated practices 533 Pumping plant and 430 Irrigation Pipeline, or existing pump & supply lines will be used. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

**Before Situation:**

A production field has an inefficient surface flood irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $5,585.40

**Scenario Cost/Unit:** $2,792.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Micro Irrigation, surface drip tape | 2522 | Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals. Tape is a minimum of 10 mil thick and has emitters built in. | Feet | $0.10 | 47916 | $4,791.60 |
| Micro Irrigation, screen or disc filter, < 3" | 2524 | Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only. | Each | $201.22 | 2 | $402.44 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario:** #3 - Potted Plant or Nursery Microirrigation System

**Scenario Description:**

A complete drip irrigation system for potted nursery crops, irrigating a 60' x 200' pad. Water delivery to the plants by surface lines and double spray-pattern stakes. Delivery line spacing is 4' w/ double pots spaced along each delivery line at 3' intervals. Irrigation is for 2010 pots. Area in question is being converted from existing system of overhead irrigation. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Payment includes on-ground mainline and drip tape, fittings, and apurtenances. Pump & supply line is not included in this payment and may be offered through associated practices 533 Pumping plant and 430 Irrigation Pipeline, or existing pump & supply lines will be used. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

**Before Situation:**

A production field has an inefficient overhead sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline

**Feature Measure:** Sq Ft

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 12,000.0

**Scenario Total Cost:** $3,575.06

**Scenario Cost/Unit:** $0.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 4 | $97.84 |
| **Materials** | | | | | | |
| Micro Irrigation, emitters or sprays and tubing | 1489 | Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item. | Feet | $1.04 | 3150 | $3,276.00 |
| Micro Irrigation, screen or disc filter, < 3" | 2524 | Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only. | Each | $201.22 | 1 | $201.22 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario:** #4 - Seasonal High Tunnel Microirrigation System

**Scenario Description:**

An irrigation system for vegetables or other specialty crops, irrigating inside of a high-tunnel poly-house typically 2,178 sq ft in size. Water delivery to the plants by surface lines and/or subsurface applicators. Spacing of the plants will vary, w/ delivery lines spaced 60". Area in question is being converted from other means of less efficient irrigation. Payment includes on-ground mainline and drip tape, fittings, and apurtenances. Pump & supply line is not included in this payment and may be offered through associated practices 533 Pumping plant and 430 Irrigation Pipeline, or existing pump & supply lines will be used. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

**Before Situation:**

A high tunnel has an inefficient overhead sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A microirrigation system is utilized to provide highly efficient irrigation to crops grown in a high tunnel. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline

**Feature Measure:** Each High Tunnel

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $250.30

**Scenario Cost/Unit:** $250.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 4 | $97.84 |
| **Materials** | | | | | | |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.07 | 2178 | $152.46 |

**Practice:** 442 - Sprinkler System

**Scenario:** #1 - Conversion to Center Pivot or Linear Move System

**Scenario Description:**

A surface irrigated field is converted to a center pivot sprinkler irrigation system or a linear move irrigation system to improve efficiency and uniformity of applied irrigation water to maintain adequate soil water for the desired level of plant growth and water quality impairment. Payment is based on length of equipment, not length of treated area.

**Before Situation:**

A 160 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

**After Situation:**

The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1300 feet in length with pressure regulators and low pressure sprinklers on drops. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Feature Measure:** Length of Center Pivot Lateral

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,300.0

**Scenario Total Cost:** $82,220.11

**Scenario Cost/Unit:** $63.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Center pivot system with appurtenances, fixed cost portion | 317 | Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Each | $5,408.72 | 1 | $5,408.72 |
| Irrigation, Center pivot system with appurtenances, variable cost portion | 318 | Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Feet | $58.84 | 1300 | $76,492.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 442 - Sprinkler System

**Scenario:** #2 - Sprinkler Conversion to Low Pressure

**Scenario Description:**

Center Pivot and Linear Move sprinkler systems are used in large crop fields with fairly regular field borders and flat topography. The scenario involves changing nozzles on center pivot or lateral move irrigation systems to low-pressure systems to improve efficiency of water use and reduce energy use. This scenario is intended for cropland areas where the objective is water conservation. Scenario includes end booms renozzled with low-pressure nozzles

**Before Situation:**

A center pivot or lateral move system has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion. The high pressure requirement for the system requires excess energy use.

**After Situation:**

A Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet is re-nozzled with low-pressure nozzles. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Feature Measure:** Length of Lateral Retrofitted

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,300.0

**Scenario Total Cost:** $7,791.11

**Scenario Cost/Unit:** $5.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Sprinkler Package, Renozzle or Retrofit, with drops and pressure regulators | 1480 | Sprinkler Package - Rennovation including sprinkler nozzle addition, and/or replacement, including new pressure regulators and drops. | Feet | $5.94 | 1300 | $7,722.00 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 442 - Sprinkler System

**Scenario:** #3 - Wheel Line System

**Scenario Description:**

A 1,280 foot wheel line (also called side roll, wheelmove, or lateral-roll) with 7 foot diameter wheels and five inch diameter supply pipeline. A wheel line consists of the mover, lateral pipe, wheels, sprinklers, couplers, and connectors to the mainline supply.

**Before Situation:**

Cropland that is flood irrigated and has poor irrigation efficiency and distribution uniformity. The slope and irregular shape of the field limit the potential for improved management to improve the irrigation efficiency or the distribution uniformity. Irrigation water moves both within the field and off it, resulting in wet areas, runoff and deep percolation. Parts of the field are over-irrigated, and other sections are under-irrigated. Runoff from the field flows into streams, water courses, and other water bodies. Excess applied irrigation water infiltrates into ground water causing degradation to the receiving waters.

**After Situation:**

A 1,280 foot wheel line with 7 foot diameter wheels and five inch diameter supply pipeline. Sprinklers are spaced along the wheel line at 40-foot intervals and risers are spaced at 60-foot increments along the mainline. The wheel line irrigates 40 acres of cropland. The wheel line improves distribution uniformity. Irrigation application efficiency improves to 75%. Water application rates meet the consumptive use of the crop and matches soil intake rates in order to prevent irrigation induced erosion, runoff, and deep percolation. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Feature Measure:** Length of Wheel Line Lateral

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,280.0

**Scenario Total Cost:** $24,487.37

**Scenario Cost/Unit:** $19.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Wheel line with appurtenances, fixed price portion. | 325 | Fixed cost portion of the wheel line system with appurtenances. This portion includes the following items: mover, pipe, sprinklers, wheels, installation. | Each | $6,744.64 | 1 | $6,744.64 |
| Irrigation, Wheel line with appurtenances, variable price portion. | 326 | Variable cost portion of the wheel line system with appurtenances. This portion includes the following items: pipe, sprinklers, wheels, installation. Does not include a mover. | Feet | $13.73 | 1280 | $17,574.40 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 442 - Sprinkler System

**Scenario:** #4 - Solid Set System

**Scenario Description:**
Installation of a solid set irrigation system. Payment includes pipe, sprinklers, connections, appurtanences, and installation.

**Before Situation:**
The typical installation will be on cropland with some existing inefficient irrigation. The farm is typically producing specialty crops, such as fresh vegetables.

**After Situation:**
The system is installed on 10 acres or less. The installed solid set system has 3-4 inch pipe sizes and sprinklers set 30 - 50 ft apart. Improved distribution uniformity and irrigation efficiency will result. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Feature Measure:** Area of Irrigation System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $42,438.41

**Scenario Cost/Unit:** $4,243.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Solid Set, w/Appurtenances | 324 | Solid Set irrigation system that includes pipe, sprinklers, connections, installation and appurtenances. | Acres | $4,236.93 | 10 | $42,369.30 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 442 - Sprinkler System

**Scenario:** #5 - Traveling Gun System, < 2in Hose

**Scenario Description:**

A portable small gun system used to apply irrigation water on small fields. A small traveling gun irrigation system is installed to apply water uniformly and at an acceptable application rate operated under pressure to effectively irrigate less than 5 acres. The irrigation system is installed with all necessary appurtenances.

**Before Situation:**

An existing traveling gun on a 5 acre field is inefficient and is not applying water uniformly or not at an acceptable application rate. Excess applied water causes irrigation induced erosion, runoff and deep percolation. The runoff and deep percolation degrade the receiving waters.

**After Situation:**

A small traveling gun irrigation system is installed to irrigate 5 acres based on the determined spacing needs. Irrigation is applied efficiently and uniformly to maintain adequate soil water for plant growth without causing excessive water loss, erosion, or water quality degradation Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

**Feature Measure:** Number of Traveling Gun Systems

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,051.69

**Scenario Cost/Unit:** $9,051.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Traveling Gun System with <= 2 in. Nominal size hose, and appurtenances light duty | 1478 | Irrigation, Traveling Gun System with <= 2 inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 500' | Inch Diameter | $6,034.46 | 1.5 | $9,051.69 |

**Practice:** 442 - Sprinkler System

**Scenario:** #6 - Traveling Gun System, 2in to 3in Hose

**Scenario Description:**

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1000’ or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations.

**Before Situation:**

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on the soil and water quality. Animal waste runs off and degrades the receiving waters.

**After Situation:**

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1” to 1½” orifice mounted onto a movable cart. 1000’ or more flexible 3” PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

**Feature Measure:** Number of Traveling Gun Systems

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $22,538.25

**Scenario Cost/Unit:** $22,538.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Traveling Gun System, > 2 to 3 inch Nominal size hose | 1479 | Irrigation, Traveling Gun System with 2.3 to 3 inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 1000'. | Inch Diameter | $7,512.75 | 3 | $22,538.25 |

**Practice:** 442 - Sprinkler System

**Scenario:** #7 - Traveling Gun System, > 3in Hose

**Scenario Description:**

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1200' or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations.

**Before Situation:**

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on the soil and water quality. Animal waste runs off and degrades the receiving waters.

**After Situation:**

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1" to 1½" orifice mounted onto a movable cart. 1200' or more flexible 4" PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

**Feature Measure:** Number of Traveling Gun Systems

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $42,627.52

**Scenario Cost/Unit:** $42,627.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Traveling Gun System, > 3 inch Nominal size hose | 1762 | Irrigation, Traveling Gun System with > 3 inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 1300' | Each | $42,627.52 | 1 | $42,627.52 |

**Practice:** 442 - Sprinkler System

**Scenario:** #8 - Pod System

**Scenario Description:**

A portable irrigation system consisting of Polyethylene (PE) pipe and pods that have attached sprinklers. This scenario addresses installation of all pod style irrigation sprinkler systems.

**Before Situation:**

Pastureland is flood irrigated and has poor irrigation efficiency and distribution uniformity. The slope and irregular shape of the field limit the potential for improved management to improve the irrigation efficiency or the distribution uniformity. Irrigation water moves both within the field and off it, resulting in wet areas, runoff and deep percolation. Runoff from the field flows into streams, water courses, and other water bodies. Excess applied irrigation water infiltrates into ground water causing degradation to the receiving waters.

**After Situation:**

A 10 acre irrigated pasture with a medium pressure irrigation system consisting of sprinkler pods along a PE line is installed. The pods and PE line are placed in different sections of the pasture by dragging both with a four wheeler. The PE line is 660 feet in length and has 14 pods evenly spaced along its length. The improved distribution uniformity and irrigation efficiency reduces the inefficient use of water on irrigated land, reducing irrigation water applied and energy use. Water application rates meet the pasture vegetation consumptive use requirements. Runoff and deep percolation as a result of irrigation are eliminated, and the receiving waters are no longer degraded. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Feature Measure:** Number of Sprinkler Pods

**Scenario Unit:** Each

**Scenario Typical Size:** 14.0

**Scenario Total Cost:** $3,803.61

**Scenario Cost/Unit:** $271.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Pod System, w/Appurtenances | 323 | Pod irrigation system that includes pod, pipe, sprinklers, connections, and appurtenances. Includes materials only. | Each | $266.75 | 14 | $3,734.50 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 449 - Irrigation Water Management

**Scenario:** #1 - IWM for row crops

**Scenario Description:**

Implementation of a water management plan for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). Payment applies to irrgation water management on a row crop operation. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

**Before Situation:**

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with a sprinkler irrigation system.

**After Situation:**

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 125.0

**Scenario Total Cost:** $1,537.76

**Scenario Cost/Unit:** $12.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $41.94 | 32 | $1,342.08 |

**Practice:** 449 - Irrigation Water Management

**Scenario:** #2 - IWM for microirrigation systems and specialty crops

**Scenario Description:**

Implementation of a water management plan for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). Payment applies to irrgation water management on a specialty crop operation, or an operation utilizing microirrgation. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 15 acre specialty crop field with a surface irrigation system.

**After Situation:**

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined. Associated Practices:441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $978.40

**Scenario Cost/Unit:** $65.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 40 | $978.40 |

**Practice:** 449 - Irrigation Water Management

**Scenario:** #3 - IWM for Seasonal High Tunnels

**Scenario Description:**

Implementation of a water management plan for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). Payment applies to irrgation water management in Seasonal High Tunnels. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success.

**After Situation:**

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined. The typical irrigated area is approximately 2,000 sq ft under a Seasonal High Tunnel. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface.

**Feature Measure:** Number of High Tunnels

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $489.20

**Scenario Cost/Unit:** $489.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 20 | $489.20 |

**Practice:** 449 - Irrigation Water Management

**Scenario:** #4 - Soil Moisture Sensors

**Scenario Description:**

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth; and the labor of using the equipment for the first year. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and utilize sensors and readings in making IWM decisions during first year. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Meters used to read sensors may be portable. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities.

**Before Situation:**

Producer uses feel method to estimate soil moisture for scheduling irrigation.

**After Situation:**

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer uses periodic soil moisture measurements to schedule irrigation resulting in improved irrigation water managment and reduced energy use. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface.

**Feature Measure:** Number of Measuring Sites

**Scenario Unit:** Each

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $2,813.70

**Scenario Cost/Unit:** $1,406.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 12 | $293.52 |
| 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. | Hours | $41.94 | 40 | $1,677.60 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $234.59 | 1 | $234.59 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $67.36 | 8 | $538.88 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 449 - Irrigation Water Management

**Scenario:** #5 - Soil Moisture Sensors with Data Recorder

**Scenario Description:**

This practice includes the installation of electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Scenario also includes the labor associated with using the equipment for the first year. Typical Scenario involves installation of resistance sensor blocks in a 120 acre field of sprinkler irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities.

**Before Situation:**

Producer uses feel method to estimate soil moisture for scheduling irrigation in the field.

**After Situation:**

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer periodically downloads continuously recorded soil moisture measurements that are used to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface., 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Feature Measure:** Number of Measuring Sites

**Scenario Unit:** Each

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,867.17

**Scenario Cost/Unit:** $1,933.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 12 | $293.52 |
| 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. | Hours | $41.94 | 40 | $1,677.60 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $644.03 | 2 | $1,288.06 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $67.36 | 8 | $538.88 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 449 - Irrigation Water Management

**Scenario:** #15 - Advanced IWM

**Scenario Description:**

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equipped with telemetry data. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System, Microirrigation; 442-Irrigation System, Sprinkler; 443-Irrigation System, Surface and Subsurface.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with sprinkler irrigation.

**After Situation:**

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 125.0

**Scenario Total Cost:** $2,404.48

**Scenario Cost/Unit:** $19.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 16 | $391.36 |
| 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. | Hours | $41.94 | 48 | $2,013.12 |

**Practice:** 460 - Land Clearing

**Scenario:** #1 - Non-Heavy Equipment

**Scenario Description:**

Site preparation of a field with a labor crew, chainsaws, chippers or similar equipment removing trees and shrubs to achieve a conservation objective. Typical scenario is approximately 1 acre of trees and shrubs to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field.

**Before Situation:**

Forested field of approximately 1 acre, with moderate density evenly spaced tree canopy.

**After Situation:**

Labor crew uses chainsaws, chippers, or similar equipment to clear trees and prepare the field for a conservation objective, includes on-site disposal as necessary. Associated practices, like plantings, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

**Feature Measure:** Area Cleared

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $824.15

**Scenario Cost/Unit:** $824.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 24 | $168.00 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 460 - Land Clearing

**Scenario:** #2 - Heavy Equipment

**Scenario Description:**

Site preparation of a field with dozer or equivalent heavy equipment to acheive a conservation objective. Typical scenario is approximately 10 acres of trees and shrubs to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field.

**Before Situation:**

Forested field of approximately 10 acres, with moderate density evenly spaced tree canopy.

**After Situation:**

Crew uses 200 HP dozer to clear trees and prepare field for conservation objective, includes on-site debris disposal as necessary. Associated practices, like plantings, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

**Feature Measure:** Area Cleared

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $10,755.85

**Scenario Cost/Unit:** $1,075.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 40 | $8,097.20 |
| **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. | Hours | $24.46 | 40 | $978.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 40 | $1,202.40 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 464 - Irrigation Land Leveling

**Scenario:** #1 - Irrigation Land Leveling

**Scenario Description:**

Reshaping of the surface of land to be irrigated to planned grades to permit uniform and efficient application of irrigation water to the leveled land. The field is leveled such that it is uniform and drains to a specifically targeted part of the field. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water

**Before Situation:**

Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/runon.

**After Situation:**

Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies. Associated Conservation Practices: 449 - Irrigation Water Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $42,568.33

**Scenario Cost/Unit:** $266.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 20000 | $42,400.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario:** #1 - Turf Reinforced Matting

**Scenario Description:**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Situation:**

TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $6,397.84

**Scenario Cost/Unit:** $1.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 90 | $190.80 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.05 | $16.10 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.05 | $16.28 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Turf reinforcement mat | 1212 | Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor. | Square Yard | $11.07 | 535 | $5,922.45 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 472 - Access Control

**Scenario:** #2 - Animal exclusion from sensitive areas

**Scenario Description:**

Excluding animals from an area in order to address identified resource concerns. This is for facilitating exclusion of animals to protect or enhance natural resource values. Any need for permanent fencing will be planned and installed using the Fence practice (382). Clearing of brush and trees is not necessary. Resource concerns include Wildlife Habitat degradation, Undesirable plant productivity and health, and/or Excessive sediment in surface waters.

**Before Situation:**

Sensitive areas are threatened by the adverse actions of domestic and/or wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream bank stability, and/or water quality.

**After Situation:**

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area. Cost represents forgone income for 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, Fence.

**Feature Measure:** Acres exluded

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $511.17

**Scenario Cost/Unit:** $51.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 26 | $498.94 |
| **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. | Hours | $24.46 | 0.5 | $12.23 |

**Practice:** 484 - Mulching

**Scenario:** #2 - Erosion Control Blanket, Vegetation Establishment

**Scenario Description:**

Installation of erosion control blanket on critical areas with steep slopes, grassed waterways or diversions. Blanket is typically made of coconut coir, wood fiber, or straw and is typically covered on both sides with polypropylene netting. Used to help control erosion and establish vegetative cover on a disturbed site around a newly constructed structural practices and is generally used with criticial area planting.

**Before Situation:**

There are areas of concentrated flow and a grassed waterway is being installed. Soil erosion is a concern and there is little to no vegetation.

**After Situation:**

The erosion control blanket is placed on concentrated flow areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established. Associated Practice: 342 Critical Area Planting

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,999.76

**Scenario Cost/Unit:** $7,999.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| **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. | Hours | $24.46 | 32 | $782.72 |
| **Materials** | | | | | | |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.32 | 5324 | $7,027.68 |

**Practice:** 484 - Mulching

**Scenario:** #3 - Erosion Control Blanket for Endangered Species, Vegetation Establishment

**Scenario Description:**

Installation of erosion control blanket on critical areas with steep slopes, grassed waterways or diversions. Blanket is typically made of straw fiber and is typically covered on both sides with biodegradable netting (Leno woven on top net). Used to help control erosion and establish vegetative cover on a disturbed site around a newly constructed structural practices, while preventing entanglement or entrapment of an endangered snake species. Installation of an ECB with this type of netting is more labor intensive than traditional blankets. This practice is typically used with criticial area planting.

**Before Situation:**

There are areas of concentrated flow and a grassed waterway is being installed. Soil erosion is a concern and there is little to no vegetation.

**After Situation:**

The erosion control blanket is placed on concentrated flow areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established. Associated Practice: 342 Critical Area Planting

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,754.56

**Scenario Cost/Unit:** $9,754.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 16 | $378.72 |
| **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. | Hours | $24.46 | 96 | $2,348.16 |
| **Materials** | | | | | | |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.32 | 5324 | $7,027.68 |

**Practice:** 484 - Mulching

**Scenario:** #4 - Natural Material, Soil Moisture Management

**Scenario Description:**

Application of straw mulch or other other state approved natural material (such as wood chips, compost, or hay) to conserve soil moisture, reduce erosion, moderate soil temperature and improve soil health. Typically used to provide partial coverage (either in-row or between rows) with tree/shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Mulches applied around growing plants shall have 100 % ground cover. Thickness of the mulch shall be adequate to prevent evaporation. Payment based on total acres mulched, assuming 3-5 ft. swatch and 10-12 ft. row spacing.

**Before Situation:**

Site conditions vary. Typical conditions include no protective cover resulting in excessive erosion, increased soil temperature and reduced soil moisture.

**After Situation:**

Straw or other natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased, and soil health is improved.

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $277.07

**Scenario Cost/Unit:** $277.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 0.5 | $11.84 |
| **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. | Hours | $24.46 | 4.2 | $102.73 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $65.00 | 2.5 | $162.50 |

**Practice:** 484 - Mulching

**Scenario:** #5 - Synthetic Material, Soil Moisture Management

**Scenario Description:**

Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, reduce erosion, and moderate soil temperature. Typically used in-row with tree/shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Payment based on actual area covered by mulching material.

**Before Situation:**

Site conditions vary. Typical conditions include no protective cover resulting in excessive erosion, increased soil temperature and reduced soil moisture.

**After Situation:**

Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved and energy use associated with irrigation is decreased.

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,696.08

**Scenario Cost/Unit:** $1,696.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Mulch, biodegradable plastic, 0.8 mil | 1304 | 0.8 mil starch-based biodegradable plastic mulch, with anchoring. Includes materials and shipping only. | Square Yard | $0.31 | 4840 | $1,500.40 |

**Practice:** 484 - Mulching

**Scenario:** #6 - Tree and Shrub, Individual Treatment, Soil Moisture Management

**Scenario Description:**

Weed barrier fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting where planting material are not planted in rows, thus requiring each tree or shrub to be treated individually. Typically used to conserve soil moisture, reduce erosion, and moderate soil temperature. Rate is per tree/shrub and assumes 1 square yard of weed barrier fabric and 5 staples/tree. Typical scenario is an installation of 100 native trees and shrubs to enhance wildlife habitat.

**Before Situation:**

Site conditions vary. Sites are often remote and trees may not be planted in rows, requiring each tree to be treated individually. The lack of mulch causes reduced soil moisture requiring additional irrigation or poor growth and/or survival.

**After Situation:**

Weed barrier fabric squares are installed with 5 sod staples each, around individual trees and shrubs. Soil moisture is conserved and energy use associated with irrigation is decreased improving growth and survival of trees/shrubs.

**Feature Measure:** Number of Trees Mulched

**Scenario Unit:** Each

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $130.00

**Scenario Cost/Unit:** $1.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 100 | $130.00 |

**Practice:** 484 - Mulching

**Scenario:** #7 - Natural Material, Soil Moisture Management, Seasonal High Tunnel

**Scenario Description:**

Application of straw mulch or other state approved natural material (such as wood chips, compost, or hay) to conserve soil moisture, moderate soil temperature and improve soil health within a Season High Tunnel. Typically used to provide 100% coverage (in-row and between rows) to suppress weeds competing with annual and perennial crops crown in the high tunnel. Mulches applied around growing plants shall have 100% ground cover. Thickness of the mulch shall be adequate to prevent evaporation.

**Before Situation:**

Site conditions vary. Typical conditions include no protective cover resulting in increased soil temperature and reduced soil moisture.

**After Situation:**

Straw or other natural mulch is applied in tightly spaced rows by hand. Soil moisture is conserved, energy use associated with irrigation is decreased, and soil health is improved.

**Feature Measure:** Each Seasonal High Tunnel

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $32.52

**Scenario Cost/Unit:** $32.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 0.5 | $11.84 |
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $65.00 | 0.13 | $8.45 |

**Practice:** 484 - Mulching

**Scenario:** #8 - Synthetic Material, Soil Moisture Management, Seasonal High Tunnel

**Scenario Description:**

Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, and moderate soil temperature within a Seasonal High Tunnel. Typically used in row with annual and perennial crops crown in the high tunnel.

**Before Situation:**

Site conditions vary. Typical conditions include no protective cover resulting in increased soil temperature and reduced soil moisture.

**After Situation:**

Synthetic mulch is applied in rows by hand. Soil moisture is conserved and energy use associated with irrigation is decreased.

**Feature Measure:** Each Seasonal High Tunnel

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $79.86

**Scenario Cost/Unit:** $79.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 0.5 | $11.84 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| **Materials** | | | | | | |
| Mulch, polyethylene plastic, 1.0 mil | 1303 | 1.0 mil polyethylene plastic mulch, with anchoring. Includes materials and shipping only. | Square Yard | $0.36 | 121 | $43.56 |

**Practice:** 484 - Mulching

**Scenario:** #60 - Natural Material - Full Coverage

**Scenario Description:**

Application of straw mulch or other other state approved natural material to reduce erosion and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with critical area planting. Assumes 2 tons of straw mulch per acre

**Before Situation:**

Typical scenario ranges from a 0.1 to 1.0 acre disturbed site around a newly constructed structural practice. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

**After Situation:**

Implementation Requirements are preprared according to the 484 Mulching Standard and implemented. Straw mulch has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $386.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 0.5 | $11.84 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $65.00 | 2 | $130.00 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario:** #1 - Chemical Application

**Scenario Description:**

This practice involves the use of various herbicides applied using ground-based machinery in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestland that was recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

**Before Situation:**

Undesirable vegetation is present on the site including herbaceous plants and woody vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

**After Situation:**

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 5 acres. Associated practices may include: 612 Tree and Shrub Establishment, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $305.13

**Scenario Cost/Unit:** $61.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 5 | $28.40 |
| **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. | Acres | $9.21 | 5 | $46.05 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 5 | $54.80 |
| 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 shipping only. | Acres | $1.51 | 5 | $7.55 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario:** #2 - Light Mechanical

**Scenario Description:**

This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems in order to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This following resource concerns: soil quality degradation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

**Before Situation:**

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of harvesting heavy equipment activities or other land uses.

**After Situation:**

Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 5 acres. Associated practices may include: 612 Tree and Shrub Establishment, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $602.49

**Scenario Cost/Unit:** $120.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2.5 | $123.43 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 5 | $79.35 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2.5 | $63.05 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario:** #3 - Light Mechanical with Chemical

**Scenario Description:**

This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems followed by appropriate herbicide application in order to improve site conditions for establishing trees and/or shrubs. Typical sites include small trees (<2" dbh) and brush cover on less than 60% of area that is not appropriate to the site or providing the desired condition for the landowner. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This following resource concerns: soil quality degradation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

**Before Situation:**

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of harvesting heavy equipment activities or other land uses.

**After Situation:**

Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 5 acres. Associated practices may include: 612 Tree and Shrub Establishment, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $907.62

**Scenario Cost/Unit:** $181.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2.5 | $123.43 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 5 | $79.35 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 5 | $28.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2.5 | $63.05 |
| **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. | Acres | $9.21 | 5 | $46.05 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 5 | $54.80 |
| 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 shipping only. | Acres | $1.51 | 5 | $7.55 |
| **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 | $168.33 | 3 | $504.99 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario:** #4 - Heavy Mechanical with Chemical

**Scenario Description:**

This practice involves the use of heavy machinery combined with appropriate herbicide application to treat an area in order to improve site conditions for establishing trees and/or shrubs. Typical sites include large trees(>2"dbh) and brush cover on 60% of area that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition and soil quality degredation - soil erosion - sheet and rill.

**Before Situation:**

The site is dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush) occupying the site. There is also a significant component of woody debris onsite. Noxious and invasive species may also be present on the site. Soils are compacted as a result of past heavy equipment activities or from other land uses. Sheet and rill erosion is ocurring in areas where the soil was severely disturbed expsoing bare soil. If left untreated, soil compaction and erosion issues will result in poor survival or reduced growth of trees/shrubs to be established on the site.

**After Situation:**

Undesirable vegetation has been removed using mechanical methods reducing competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 5 acres. Associated practices may include: 612 Tree and Shrub Establishment, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $2,082.72

**Scenario Cost/Unit:** $416.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 5 | $28.40 |
| Heavy mechanical site prep, shearing, V-blade, K-G blading | 1314 | Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs. | Acres | $147.89 | 3 | $443.67 |
| Heavy mechanical site prep, raking | 1317 | Mechanical operations that pushing and raking trees and vegetation. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs. | Acres | $160.05 | 3 | $480.15 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **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. | Acres | $9.21 | 5 | $46.05 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 5 | $54.80 |
| 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 shipping only. | Acres | $1.51 | 5 | $7.55 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 500 - Obstruction Removal

**Scenario:** #1 - Removal and Disposal of Concrete Slab

**Scenario Description:**

Remove and disposal of concrete slabs by saw cutting, demolition, excavation or other means required for removal. Dispose of concrete slabs so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all concrete slabs by removal to an approved location, or reuse location. Typical disposal is burial on site. Remove and dispose all concrete slabs in order to apply conservation practices or facilitate the planned land use. Concrete slab removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be a 1000 square feet of impaired land. The removal of concrete slabs will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all concrete slabs from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Land Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $740.32

**Scenario Cost/Unit:** $0.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $88.81 | 2 | $177.62 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $96.09 | 2 | $192.18 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 500 - Obstruction Removal

**Scenario:** #2 - Removal and Disposal of Fence, Feedlot

**Scenario Description:**

Remove and disposal of all existing fences around a livestock feeding/waste facility by demolition, excavation or other means required for removal. Dispose of all fence materials from the site so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all materials by removal to an approved landfill, wood chipping and land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Fence removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

**Before Situation:**

On headquarters or any land where existing feedlot fence interferes with planned land use development, public safety, or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical feedlot fence will be 800 in linear feet. The removal of the fence will be performed with the use of equipment and hand labor. Dispose of all debris from the fence removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape such as Upland Wildlife Habitat Management (645).

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $2,735.00

**Scenario Cost/Unit:** $3.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 24 | $1,292.40 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 24 | $605.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 500 - Obstruction Removal

**Scenario:** #26 - Removal and Disposal of Rock and or Boulders

**Scenario Description:**

Remove and disposal of rock and or boulders by drilling, blasting, demolition, excavation or other means required for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be less than 1 acre impaired area. The removal of rock and or boulders will be performed by drilling, blasting, demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $15,711.92

**Scenario Cost/Unit:** $31.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 28 | $1,704.08 |
| Drilling & Blasting Rock, Bulk with blasting mats | 1397 | Bulk drilling & Blasting of rock or boulders in locations requiring the use of blasting mats (Min. 175 CY, Max 1500 CY). Includes all equipment, labor and supplies to complete the blast. | Cubic Yards | $18.07 | 500 | $9,035.00 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $96.09 | 28 | $2,690.52 |
| **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. | Hours | $31.49 | 24 | $755.76 |
| 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. | Hours | $24.46 | 28 | $684.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 28 | $841.68 |

**Practice:** 511 - Forage Harvest Management

**Scenario:** #1 - Improved Forage Quality

**Scenario Description:**
Improved cultural practices and recordkeeping result in better forage quality and better livestock performance.

**Before Situation:**
Forage cutting heights are as close to the ground as equipment will allow resulting in very low stubble height. Plant regrowth is very slow. Forage quality tests are not regularly done. Records of forage quality components, cutting heights, moisture content, and harvest schedule are not regularly kept.

**After Situation:**
Forage cutting heights are raised to leave at least 3-4" stubble height for cool season grasses and 6" - 8" (use a boot on the mower) for warm season grasses. Increased residual forage results in much faster plant regrowth. Forage quality tests are submitted to an accredited lab for analysis. Records of forage quality components, cutting heights, moisture content, and harvest schedule are regularly kept to track increased forage quality and improved livestock performance.

**Feature Measure:** Improved Relative Feed Value

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $186.22

**Scenario Cost/Unit:** $6.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $22.74 | 2 | $45.48 |

**Practice:** 511 - Forage Harvest Management

**Scenario:** #3 - Perennial Crops - Delayed Mowing

**Scenario Description:**

In perennial forage crops, delaying the harvest of the first cutting to promote the reproduction of ground nesting birds. The delayed harvest results in a decrease in overall forage quality (33% reduction assumed), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After young have fledged the field will be harvested for dry forages. Typical forage crops are half alfalfa and half grass.

**Before Situation:**

Perennial forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

**After Situation:**

Perennial crops are harvested with a delayed mowing; forage quality is compromised, however, the survival of ground nesting birds is promoted.

**Feature Measure:** Increased grassland bird populatio

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $3,323.24

**Scenario Cost/Unit:** $110.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Foregone Income** | | | | | | |
| FI, Hay, Alfalfa | 2121 | Alfalfa Hay is Primary Crop | Ton | $83.17 | 27.6 | $2,295.49 |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | 27.6 | $841.52 |
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $22.74 | 2 | $45.48 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #1 - Interseeding Legumes and/or forbs

**Scenario Description:**

Interseed legumes and/or forbs into an existing grass stand for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. Scenario is appropriate for conventional production. Payment includes seed, seeding and fertility for interseeding establishment.

**Before Situation:**

Existing grass stand that needs additional species diversity.

**After Situation:**

A more diverse grass stand provides improved forage quality and availability, and improved soil condition. Payment scenario is based on red and ladino clover interseeded into a 20 acre cool season grass stand. Inputs are based on medium to low existing fertility.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $3,259.00

**Scenario Cost/Unit:** $162.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 20 | $130.00 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 20 | $160.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 20 | $426.80 |
| **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 | $0.39 | 700 | $273.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 2000 | $660.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 40 | $649.60 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #2 - Interseed Legumes and/or forbs Organic

**Scenario Description:**

Interseed legumes and/or forbs into an existing grass stand for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. Scenario is appropriate for organic production. Payment includes seed, seeding and fertility for interseeding establishment.

**Before Situation:**

Existing grass stand that needs additional species diversity.

**After Situation:**

A more diverse grass stand provides improved forage quality and availability, and improved soil condition. Payment scenario is based on red and ladino clover interseeded into a 20 acre cool season grass stand. Inputs are based on medium to low existing fertility.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $3,028.20

**Scenario Cost/Unit:** $151.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 20 | $130.00 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 20 | $160.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 20 | $426.80 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 40 | $649.60 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.07 | 700 | $49.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.15 | 2000 | $300.00 |
| Certified Organic, Perennial Grasses, Legumes and/or Forbs | 2340 | Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only. | Acres | $65.61 | 20 | $1,312.20 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #3 - Introduced Grass Establishment or Renovation

**Scenario Description:**

Establishing a new stand or renovating a poor stand to introduced grass, or grass with legumes and/or forbs to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Scenario is appropriate for conventional production. Payment includes site preparation, seed, seeding fertilizer, lime, and foregone income for loss of production during establishment/renovation

**Before Situation:**

Existing grass stand does not meet the forage demands, particularly during during periods of low forage production. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion, and soil quality.

**After Situation:**

Establish introduced grass and legume mix stand to improve livestock nutrition through improved forage quality and availability, and improved soil condition. Payment scenario is based on converting an existing poor condition sod to introduced grass/legume/forb mix using mechanical or chemical activities.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,517.70

**Scenario Cost/Unit:** $225.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 20 | $113.60 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 20 | $130.00 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 20 | $160.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 20 | $426.80 |
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | 30 | $914.70 |
| **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 | $0.44 | 1000 | $440.00 |
| 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 | $0.39 | 860 | $335.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 1660 | $547.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 40 | $649.60 |
| 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. | Acres | $9.21 | 20 | $184.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 20 | $615.00 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #4 - Introduced Grass Establishment or Renovation Organic

**Scenario Description:**

Establishing a new stand or renovating a poor stand to introduced grass, or grass with legumes and/or forbs to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Scenario is appropriate for organic production. Payment includes site preparation, seed, seeding fertilizer, lime, and foregone income for loss of production during establishment/renovation

**Before Situation:**

Existing grass stand does not meet the forage demands, particularly during during periods of low forage production. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion, and soil quality.

**After Situation:**

Establish introduced grass and legume mix stand to improve livestock nutrition through improved forage quality and availability, and improved soil condition. Payment scenario is based on converting an existing poor condition sod to introduced grass/legume/forb mix using mechanical or chemical activities.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,606.30

**Scenario Cost/Unit:** $230.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 40 | $416.00 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 20 | $160.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 20 | $426.80 |
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass, Organic | 2200 | Organic general Grass Hay is Primary Land Use | Ton | $35.07 | 30 | $1,052.10 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 40 | $649.60 |
| Nitrogen, Organic | 266 | ORGANIC Nitrogen | Pound | $0.24 | 1000 | $240.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.07 | 700 | $49.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.15 | 2000 | $300.00 |
| Certified Organic, Perennial Grasses, Legumes and/or Forbs | 2340 | Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only. | Acres | $65.61 | 20 | $1,312.20 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #7 - Native Grass Establishment or Renovation - with fertility

**Scenario Description:**

Establishing a new stand or renovating a poor stand to native grass, or grass with legumes and/orforbs to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Scenario is appropriate for conventional production on sites where fertilzer is needed for establishment. Payment includes site preparation, seed, seeding, fertilizer, lime and foregone income for loss of production during establishment/renovation

**Before Situation:**

Existing grass stand does not meet the forage demands, particularly during during periods of low forage production. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion, and soil quality.

**After Situation:**

Establish native grass and legume and/or forbs mix stand to improve livestock nutrition through improved forage quality and availability, and improved soil condition. Payment scenario is based on converting an existing poor condition sod to native grass/legume/forb mix using mechanical or chemical activities.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $6,771.80

**Scenario Cost/Unit:** $338.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 40 | $227.20 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 20 | $160.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 20 | $426.80 |
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | 60 | $1,829.40 |
| **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 | $0.39 | 860 | $335.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 1660 | $547.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 40 | $649.60 |
| 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. | Acres | $9.21 | 40 | $368.40 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 20 | $2,226.60 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #9 - Pasture Renovation Utilizing Interim Seeding

**Scenario Description:**

Renovation of an existing pasture where an interim stand is established for one year prior to the perennial stand being established. Scenario is appropriate for renovating an existing stand of endophyte infected fescue using the spray - smother - spray technique (spray existing grass before heading in early spring, plant a smother crop, spray smother crop in the fall, plant new grass stand into the stubble). Scenario is also appropriate for situations where any interim species is established and then the perennial is seeded after. Payment includes chemical operations, interim crop establishment and termination, and seeding of new renovated grass stand, including fertilizer and lime needed for a successful establishment.

**Before Situation:**

Existing grass stand is primarily endophyte infected fescue or unwanted vegetative cover in decreased animal health and productivity.

**After Situation:**

Stand is renovated without the loss of production. Annual grass planted as a smother crop would be grazed, extending the grazing season. Stand is renovated to a non-endophyte introduced grass/legume stand using the spray-smother-spray technique.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $6,201.30

**Scenario Cost/Unit:** $310.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 40 | $227.20 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 20 | $130.00 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 20 | $160.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 40 | $853.60 |
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | 30 | $914.70 |
| **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 | $0.44 | 1000 | $440.00 |
| 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 | $0.39 | 860 | $335.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 1660 | $547.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 40 | $649.60 |
| 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. | Acres | $9.21 | 40 | $368.40 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 20 | $615.00 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario:** #10 - Introduced Perennial & Native Grass Mix, foregone income

**Scenario Description:**

Establish or reseed adapted introduced grasses and at least one native species to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of grasses for pasture, hayland, and wildlife openings. Native grass species which have a significantly greater cost than introduced species comprise one third of the grass mixture. This practice may be utilized for organic or regular production. This scenario assumes seed, equipment and labor for seed bed prep, tillage, seeding. The land being seeded was previously cropland with a typical rotation of corn and soybeans.

**Before Situation:**

Land currently being cropped. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

**After Situation:**

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forage and Biomass Planti

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $7,901.50

**Scenario Cost/Unit:** $395.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 20 | $208.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 20 | $426.80 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 10 | $3,220.90 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 10 | $3,255.60 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2502 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $79.02 | 10 | $790.20 |

**Practice:** 516 - Livestock Pipeline

**Scenario:** #1 - Above Ground Pipeline

**Scenario Description:**

An above ground plastic pipeline is installed to convey water from a source of supply to points of use for livestock in a prescribed grazing system or wildlife for temporary watering locations.

**Before Situation:**

Livestock have an inadequate or unacceptable water supply which can lead to compromised animal health. Water can be supplied from a central source(s) by piping to one or more locations in the pasture. Water locations are temporary and occur during non-freezing times of the year.

**After Situation:**

An above ground plastic pipeline is installed to convey water from a water source to point of use for temporary watering. Payment incorporates pipe and quick connect coupler and fittings. The pipeline is installed as a facilitating practice for supplying water in a managed grazing system, to reduce soil erosion, improve water quality, improve health and vigor of key forage plant species and improve or maintain animal health. The pipeline is to be protected from UV radiation damage, as well as damage from vehicles, animals, people, and fire. The landowner is responsible for repair or replacement of the pipeline as necessary under O&M during the specified life span of the practice. Cost data is applicable to organic and conventional agricultural production systems. Associated practices include Fencing (382), Prescribed Grazing (528), Trails and Walkways (575), Access Control (472), Pumping Plant (533), Water Well (642), Heavy Use Area (561) and Watering Facility (614).

**Feature Measure:** Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $2,570.17

**Scenario Cost/Unit:** $1.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 10 | $244.60 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.57 | 878 | $2,256.46 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 516 - Livestock Pipeline

**Scenario:** #2 - Buried Pipeline, < 2in Plastic

**Scenario Description:**

Installation of a plastic pipeline, less than 2" diameter, to convey water from a source of supply to points of use for livestock in a prescribed grazing system or for wildlife. Installation is by trenching, or by backhoe across a stream or other locations where installation of the pipeline by trenching is not feasible.

**Before Situation:**

Livestock have an inadequate or unacceptable water supply which can lead to compromised animal health. Water can be supplied from a central source(s) by piping to one or more locations in the pasture. Soil conditions are suitable for pipe installation without bedding.

**After Situation:**

A 1½ inch diameter, Schedule 40 PVC plastic pipeline for stock watering, 4165 ft long is installed for supplying water in a managed grazing system, to reduce soil erosion, improve water quality, improve health and vigor of key forage plant species and improve or maintain animal health. Payment includes couplers and fittings and watering point connection (hydrant, shut off valves, etc.). Scenario represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices include Fencing (382), Prescribed Grazing (528), Trails and Walkways (575), Access Control (472), Pumping Plant (533), Water Well (642), Heavy Use Area (561) and Watering Facility (614).

**Feature Measure:** Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 4,165.0

**Scenario Total Cost:** $8,745.83

**Scenario Cost/Unit:** $2.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 12 | $375.48 |
| Trencher, 8 in. | 936 | Equipment and power unit costs. Labor not included. | Hours | $46.70 | 34 | $1,587.80 |
| **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. | Hours | $24.46 | 42 | $1,027.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 34 | $857.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 9 | $270.54 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3' Bury | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $51.57 | 6 | $309.42 |
| Pipe, PVC, 1 1/2 in., SCH 40 | 975 | Materials: - 1 1/2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $0.96 | 4165 | $3,998.40 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 516 - Livestock Pipeline

**Scenario:** #3 - Buried Pipeline, 2in - 3in Plastic

**Scenario Description:**

Installation of a 2" - 3" diameter plastic pipeline to convey water from a source of supply to points of use for livestock in a prescribed grazing system or for wildlife. Installation is by trenching, or by backhoe across a stream or other locations where installation of the pipeline by trenching is not feasible.

**Before Situation:**

Livestock have an inadequate or unacceptable water supply which can lead to compromised animal health. Water can be supplied from a central source(s) by piping to one or more locations in the pasture. Soil conditions are suitable for pipe installation without bedding.

**After Situation:**

A 2½ inch diameter, Schedule 40 PVC plastic pipeline for stockwatering, 3300 ft long is installed for supplying water in a managed grazing system, to reduce soil erosion, improve water quality, improve health and vigor of key forage plant species and improve or maintain animal health. Payment includes couplers and fittings. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices include Fencing (382), Prescribed Grazing (528), Trails and Walkways (575), Access Control (472), Pumping Plant (533), Water Well (642), Heavy Use Area (561) and Watering Facility (614).

**Feature Measure:** Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,300.0

**Scenario Total Cost:** $11,141.41

**Scenario Cost/Unit:** $3.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 12 | $375.48 |
| Trencher, 8 in. | 936 | Equipment and power unit costs. Labor not included. | Hours | $46.70 | 25 | $1,167.50 |
| **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. | Hours | $24.46 | 33 | $807.18 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 25 | $630.50 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 3856 | $7,480.64 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 516 - Livestock Pipeline

**Scenario:** #4 - Buried Pipeline, >3in

**Scenario Description:**

Installation of a large diameter plastic pipeline to convey livestock water from a spring development to a watering facility to service a prescribed grazing system.

**Before Situation:**

Livestock have an inadequate or unacceptable water supply which can lead to compromised animal health. Water can be supplied from a central source such as a spring by piping to a watering facility. Soil conditions are suitable for pipe installation without bedding.

**After Situation:**

A delivery pipe (typically 4" diameter, Schedule 40 PVC Plastic) from a spring development to a watering facility, or from water source to watering facility for gravity flow systems. The pipeline is installed as a facilitating practice for supplying water in a managed grazing system, to reduce soil erosion, improve water quality, improve health and vigor of key forage plant species and improve or maintain animal health. Payment incorporates couplers and fittings. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices include Fencing (382), Prescribed Grazing (528), Trails and Walkways (575), Access Control (472), Pumping Plant (533), Water Well (642), Heavy Use Area (561) and Watering Facility (614).

**Feature Measure:** Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $5,161.44

**Scenario Cost/Unit:** $6.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 60 in. | 1459 | Trenching, earth, 12 inch wide x 60 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling. | Feet | $1.67 | 800 | $1,336.00 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 1742 | $3,379.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 516 - Livestock Pipeline

**Scenario:** #5 - Bedded Pipeline

**Scenario Description:**

Installation of a gravel-bedded plastic pipeline in locations or conditions where the gravel bedding is necessary component of pipeline installation due to shallow bedrock, excessively rocky or otherwise unfavorable soil conditions so that the pipeline is evenly supported and protected from damage throughout the length of the trench. The purpose of the pipeline installation is to convey water from a water supply source to points of use for livestock in a prescribed grazing system or wildlife.

**Before Situation:**

Livestock have an inadequate or unacceptable water supply which can lead to compromised animal health. Water can be supplied from a central source(s) by piping to one or more locations in the pasture. Soil conditions (excessively stoney soil, unstable soil or frequent crossing by heavy equipment) requires the pipe to be protected by gravel backfill.

**After Situation:**

1600 feet of Schedule 40 PVC plastic pipeline (800' of 1 1/2" diameter, and 800' of 2 1/2" diameter) is installed in gravel bedding in pastureland as part of a livestock water delivery system. The pipeline is installed as a facilitating practice for supplying water in a managed grazing system, to reduce soil erosion, improve water quality, improve health and vigor of key forage plant species and improve or maintain animal health. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices include Fencing (382), Prescribed Grazing (528), Trails and Walkways (575), Access Control (472), Pumping Plant (533), Water Well (642), Heavy Use Area (561) and Watering Facility (614).

**Feature Measure:** Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,600.0

**Scenario Total Cost:** $6,516.45

**Scenario Cost/Unit:** $4.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 24 | $750.96 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 59.3 | $1,820.51 |
| Pipe, PVC, 1 1/2 in., SCH 40 | 975 | Materials: - 1 1/2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $0.96 | 800 | $768.00 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 935 | $1,813.90 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 516 - Livestock Pipeline

**Scenario:** #6 - Cased Pipeline with Boring

**Scenario Description:**

Installation of a 2"- 3" plastic pipeline within an outer casing, bored under a road or other obstruction to convey water from a source of supply to points of use for livestock in a prescribed grazing system or wildlife.

**Before Situation:**

Livestock have an inadequate or unacceptable water supply which can lead to compromised animal health. Water can be supplied from a central source(s) by piping to one or more locations in the pasture. Soil conditions or location require boring to facilitate pipe installation.

**After Situation:**

The typical installation consists of installing 60 feet of a 2.5 inch, Schedule 40 PVC plastic pipe with a 4 inch outer casing under a roadbed. Pipeline boring includes all pipe under roadbed and labor and equipment involved during installation of pipe. The pipeline is installed as a facilitating practice for supplying water in a managed grazing system, to reduce soil erosion, improve water quality, improve health and vigor of key forage plant species and improve or maintain animal health. Payment incorporates couplers and fittings. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices include Fencing (382), Prescribed Grazing (528), Trails and Walkways (575), Access Control (472), Pumping Plant (533), Water Well (642), Heavy Use Area (561) and Watering Facility (614).

**Feature Measure:** Foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 60.0

**Scenario Total Cost:** $7,294.43

**Scenario Cost/Unit:** $121.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 1 | $31.29 |
| Horizontal Boring, Greater Than 3 in. diameter | 1132 | Includes equipment, labor and setup. | Feet | $102.08 | 60 | $6,124.80 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 1 | $30.06 |
| **Materials** | | | | | | |
| Pipe, PE, 4 in., DR 9 | 1002 | Materials: - 4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $7.05 | 60 | $423.00 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 70 | $135.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario:** #18 - Compacted Earth Liner with Soil Cover

**Scenario Description:**

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Scenario includes a 12" compacted clay liner with 6" of soil cover covering an area 1 acre in size. Material haul < 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an econical haul distance. Material haul < 1 mile.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material including

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,613.0

**Scenario Total Cost:** $15,672.55

**Scenario Cost/Unit:** $9.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1613 | $6,887.51 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 807 | $2,808.36 |
| 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 Yards | $1.57 | 2420 | $3,799.40 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 15 | $1,449.15 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario:** #19 - Compacted Earth Liner

**Scenario Description:**

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Scenario includes a 12" compacted clay liner covering an area 1 acre in size. Material haul < 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material haul < 1 mile.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,613.0

**Scenario Total Cost:** $11,597.20

**Scenario Cost/Unit:** $7.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1613 | $6,887.51 |
| 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 Yards | $1.57 | 1613 | $2,532.41 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 15 | $1,449.15 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario:** #40 - Soil Dispersant - Uncovered

**Scenario Description:**

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions and compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,613.0

**Scenario Total Cost:** $11,084.66

**Scenario Cost/Unit:** $6.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1613 | $6,887.51 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 6 | $298.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Soil Dispersant | 1490 | Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent) | Ton | $446.66 | 6.53 | $2,916.69 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario:** #41 - Soil Dispersant - Covered

**Scenario Description:**

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material including

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,226.0

**Scenario Total Cost:** $17,972.17

**Scenario Cost/Unit:** $5.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 3226 | $13,775.02 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 6 | $298.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Soil Dispersant | 1490 | Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent) | Ton | $446.66 | 6.53 | $2,916.69 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario:** #42 - Bentonite Treatment - Uncovered

**Scenario Description:**

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,613.0

**Scenario Total Cost:** $114,932.14

**Scenario Cost/Unit:** $71.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1613 | $6,887.51 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 6 | $298.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 7 | $176.54 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $20.46 | 5227 | $106,944.42 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario:** #43 - Bentonite Treatment - Covered

**Scenario Description:**

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with bentonite.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material (includes

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,227.0

**Scenario Total Cost:** $121,823.92

**Scenario Cost/Unit:** $37.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 3227 | $13,779.29 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 6 | $298.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 7 | $176.54 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $20.46 | 5227 | $106,944.42 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

**Scenario:** #1 - Flexible Membrane - Uncovered without liner drainage or venting

**Scenario Description:**

Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Surface area of Liner Material (incl

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420.0

**Scenario Total Cost:** $37,681.62

**Scenario Cost/Unit:** $15.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 2420 | $3,146.00 |
| **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. | Hours | $31.49 | 41 | $1,291.09 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 33 | $3,188.13 |
| **Materials** | | | | | | |
| Synthetic Liner, 60 mil | 2109 | Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Feet | $1.38 | 21780 | $30,056.40 |

**Practice:** 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

**Scenario:** #2 - Flexible Membrane - Uncovered with liner drainage or venting

**Scenario Description:**

Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Surface area of Liner Material (incl

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420.0

**Scenario Total Cost:** $55,307.02

**Scenario Cost/Unit:** $22.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 2420 | $3,146.00 |
| **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. | Hours | $31.49 | 41 | $1,291.09 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 33 | $3,188.13 |
| **Materials** | | | | | | |
| Geonet | 1778 | Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only. | Square Yard | $6.87 | 2420 | $16,625.40 |
| Synthetic Liner, 60 mil | 2109 | Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Feet | $1.38 | 21780 | $30,056.40 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1000 | $1,000.00 |

**Practice:** 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

**Scenario:** #3 - Flexible Membrane - Covered without liner drainage or venting

**Scenario Description:**

Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, and a geotextile or soil cushion to protect liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Surface area of Liner Material (incl

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420.0

**Scenario Total Cost:** $42,127.51

**Scenario Cost/Unit:** $17.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 2420 | $3,146.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 807 | $3,445.89 |
| **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. | Hours | $31.49 | 41 | $1,291.09 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 33 | $3,188.13 |
| **Materials** | | | | | | |
| Synthetic Liner, 60 mil | 2109 | Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Feet | $1.38 | 21780 | $30,056.40 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1000 | $1,000.00 |

**Practice:** 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

**Scenario:** #4 - Flexible Membrane - Covered with liner drainage or venting

**Scenario Description:**

Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, a geotextile or soil cushion to protect liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Surface area of Liner Material (incl

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420.0

**Scenario Total Cost:** $58,752.91

**Scenario Cost/Unit:** $24.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 2420 | $3,146.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 807 | $3,445.89 |
| **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. | Hours | $31.49 | 41 | $1,291.09 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 33 | $3,188.13 |
| **Materials** | | | | | | |
| Geonet | 1778 | Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only. | Square Yard | $6.87 | 2420 | $16,625.40 |
| Synthetic Liner, 60 mil | 2109 | Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Feet | $1.38 | 21780 | $30,056.40 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1000 | $1,000.00 |

**Practice:** 522 - Pond Sealing or Lining - Concrete

**Scenario:** #3 - Reinforced concrete liner

**Scenario Description:**

Construction of a concrete liner to address a water quality degradation or Livestock Production Limitation resource concern by reducing seepage from ponds. Practice implementation includes construction of a concrete liner to the designed liner thickness. Planned management of the impoundment and lack of availability of clay material precludes the use of a compacted clay liner, so a concrete lining is planned according to CPS 522. Associated practices include CPS 378. The reinforced concrete lining will be 5 inches thick and cover the bottom and side slopes of the pit. The typical scenario is for a rectangular pit, 100 ft x 120 ft with 2:1 side slopes, 12 feet deep, with a 16 ft wide access ramp (also concrete lined) on a 9:1 slope. Does not apply to waste storage structures.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Planned management of the impoundment and lack of availability of clay material precludes the use of a compacted clay liner.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds.

**Feature Measure:** Surface area to be lined

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 18,066.0

**Scenario Total Cost:** $133,319.96

**Scenario Cost/Unit:** $7.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 91 | $33,429.76 |
| 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 Yards | $487.76 | 188 | $91,698.88 |
| 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 Yards | $2.12 | 502 | $1,064.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 224 | $6,876.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 522 - Pond Sealing or Lining - Concrete

**Scenario:** #6 - Concrete liner, non-reinforced

**Scenario Description:**

Construction of a non-reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A non-reinforced concrete liner is intended to be used where liquid tightness is not required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

**After Situation:**

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Concrete liner

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 278.0

**Scenario Total Cost:** $64,129.21

**Scenario Cost/Unit:** $230.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 278 | $50,712.76 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 278 | $1,187.06 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator. | Hours | $70.71 | 10 | $707.10 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 278 | $8,156.52 |
| Property/Safety Signs | 293 | Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $1.36 | 2 | $2.72 |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $3.65 | 15 | $54.75 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 566 | $2,960.18 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 522 - Pond Sealing or Lining - Concrete

**Scenario:** #7 - Concrete liner, reinforced

**Scenario Description:**

Construction of a reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A reinforced concrete liner is intended to be used where liquid tightness is required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

**After Situation:**

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Concrete Liner

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 347.0

**Scenario Total Cost:** $141,031.79

**Scenario Cost/Unit:** $406.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 347 | $127,473.92 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 278 | $1,187.06 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator. | Hours | $70.71 | 12 | $848.52 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 278 | $8,156.52 |
| Property/Safety Signs | 293 | Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $1.36 | 2 | $2.72 |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $3.65 | 15 | $54.75 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $5.23 | 566 | $2,960.18 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #1 - Low Intensity, > 7 Day Rotation Frequency

**Scenario Description:**

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping. Livestock graze each pasture for more than seven (7) days in rotation and adequate rest is provided for the forages.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, streambank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Typical scenario is based on a grazing system consisting of a 30 animal unit cow/calf operation (including bull(s), calves and replacement females) on 80 acres. Activities include farm labor to mow or clip pastures; monitor and measure forage growth; complete record keeping; analyze plant growth and animal performance; and make decisions or other management techniques. Management techniques reduce the use of supplemental feed, control weeds, and reduce energy requirements. Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas and efficient harvest of forage resources. Runoff, sediment and nutrient loss are reduced by improving plant density, diversity and percent cover. Grazing system success is evaluated through short term monitoring and maintaining grazing stop height requirements. Acquisition of technical knowledge needed to effectively implement prescribed grazing. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $2,304.85

**Scenario Cost/Unit:** $28.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 10 | $207.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $31.49 | 15 | $472.35 |
| 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. | Hours | $24.46 | 60 | $1,467.60 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #2 - Medium Intensity, 7-3 Days Rotation Frequency

**Scenario Description:**

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping. Livestock graze each pasture from three (3) to seven (7) days in rotation. Rotation is based on monitoring livestock demand and supply.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition, as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, streambank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Typical scenario is based on a grazing system consisting of a 30 animal unit cow/calf operation (including bull(s), calves and replacement females) on 80 acres. Scenario results in an increase (above the low intensity option) in labor required to complete the following activities: farm labor to mow or clip pastures; monitor and measure forage growth; complete record keeping; analyze plant growth and animal performance; and make decisions or other management techniques. Management techniques reduce the use of supplemental feed, control weeds, and reduce energy requirements. Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas and efficient harvest of forage resources. Runoff, sediment and nutrient loss are reduced by improving plant density, diversity and percent cover. Grazing system success is evaluated through short term monitoring and maintaining grazing stop height requirements. Acquisition of technical knowledge needed to effectively implement prescribed grazing. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $3,364.15

**Scenario Cost/Unit:** $42.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 20 | $414.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $31.49 | 30 | $944.70 |
| 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. | Hours | $24.46 | 80 | $1,956.80 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #3 - High Intensity, <=2 Day Rotation Frequency

**Scenario Description:**

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping. Livestock graze each pature/paddock from less than three (3) days in rotation. Rotation is based on monitoring livestock demand and supply.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition, as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, streambank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Typical scenario is based on a grazing system consisting of a 30 animal unit cow/calf operation (including bull(s), calves and replacement females) on 80 acres. Scenario results in an increase (above the medium intensity option) in labor required to complete the following activities: farm labor to mow or clip pastures; monitor stop grazing heights and measure forage growth; complete record keeping; analyze plant growth and animal performance; and make decisions or other management techniques. Management techniques reduce the use of supplemental feed, control weeds, and reduce energy requirements. Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas and efficient harvest of forage resources. Runoff, sediment and nutrient loss are reduced by improving plant density, diversity and percent cover. Grazing system success is evaluated through short term monitoring and maintaining grazing stop height requirements. Acquisition of technical knowledge needed to effectively implement prescribed grazing. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $4,860.45

**Scenario Cost/Unit:** $60.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 3 | $327.75 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 30 | $621.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $31.49 | 45 | $1,417.05 |
| 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. | Hours | $24.46 | 100 | $2,446.00 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #4 - Enhanced - Strip Grazing

**Scenario Description:**

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex: photos points, stubble height after grazing, etc.) & record keeping. Livestock are part of a managed grazing system which includes utilization of management techniques such as stockpiling/strip grazing to assist in extending the grazing season and improve animal demand and supply efficiency, or summer strip grazing on mature pasture to improve soil health by maintaining and/or improving ideal cover, plant diversity, organic matter and soil temperatures favorable for sustained microbial life.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition, as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, streambank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Typical scenario is based on a grazing system consisting of a 30 animal unit cow/calf operation (including bull(s), calves and replacement females) on 80 acres for a 200 to 290 day grazing season. Scenario results in an increase (above the Standard option) in labor required to complete the following activities: farm labor to mow or clip pastures; monitor and measure forage growth; complete record keeping; analyze plant growth and animal performance; and make decisions or other management techniques. Management techniques reduce the use of supplemental feed, control weeds, and reduce energy requirements. Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas and efficient harvest of forage resources. Runoff, sediment and nutrient loss are reduced by improving plant density, diversity and percent cover. Grazing system success is evaluated through short term monitoring. Acquisition of technical knowledge needed to effectively implement prescribed grazing. Consultant or TSP used to develop detailed grazing plan. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $5,817.97

**Scenario Cost/Unit:** $72.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 3 | $327.75 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 30 | $621.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $31.49 | 45 | $1,417.05 |
| 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. | Hours | $24.46 | 100 | $2,446.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 8 | $772.88 |
| **Materials** | | | | | | |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $46.16 | 4 | $184.64 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #5 - High Density Grazing

**Scenario Description:**

An improved grazing management system where livestock are grazed on pasture and managed at a stock density of at least 50,000 lbs for 75% of the grazing days. Pastures will be managed for a livestock utilization rate of 60% per grazing event. The grazing days will be identified in the Prescribed Grazing Plan.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition, as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, streambank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

A grazing system for a 30 animal unit cow-calf operation (includes bull(s), calves and replacement females) on 80 acres and designed for a 300 day grazing season. The grazing system has a stock density of at least 50,000 pounds for 75% of the grazing days. Pastures will be monitored and measure pasture growth to ensure a livestock utilization rate of 60% or less per grazing event. Acquisition of technical knowledge needed to effectively implement prescribed grazing is included. Management techniques will improve soil condition, reduce soil compaction, reduce the use of supplemental feed, reduce the need for weed control, and reduce energy requirements. Consultant or TSP used to develop detailed grazing plan. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** ac

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $6,590.85

**Scenario Cost/Unit:** $82.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 3 | $327.75 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 30 | $621.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $31.49 | 45 | $1,417.05 |
| 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. | Hours | $24.46 | 100 | $2,446.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 16 | $1,545.76 |
| **Materials** | | | | | | |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $46.16 | 4 | $184.64 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #6 - Deferment, 90 - 209 days

**Scenario Description:**

Defer grazing of the pasture for a minimum of 90 days to manage for any of the following purposes: invasive weed control; improve the health of the forage plants; or provide cover for wildlife species. Keep records of dates out and monitor to determine when desired objectives of deferment are met. Does not include the purpose of deferment for the establishment of forages.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition, as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, stream bank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Scenario describes activities completed to restrict grazing for a defined period during the normal grazing period to provide benefits for invasive weed control, improvement in the health of the forage plants or providing cover for wildlife species. Activities include moving livestock to alternate locations, sampling and analyzing pasture condition, recordkeeping. Forgone Income used represents the acreage of usable forage not utilized during the deferment period as a proportion of the grazing season. Typical size of 80 acre pasture operation with 30 animal units where 50% of the acreage (or 40 acres) is deferred from grazing for 90 days. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,512.45

**Scenario Cost/Unit:** $62.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Trucking, moving livestock to new paddock | 961 | Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs. | Mile | $3.53 | 50 | $176.50 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 86 | $1,650.34 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| 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. | Hours | $24.46 | 8 | $195.68 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #7 - Deferment, >=210 days

**Scenario Description:**

Defer the pasture for 210 days and up to a growing season to manage for invasive weeds when necessary, to improve the health of the plants and/or provide nesting habitat for wildlife species. Keep records of dates out and monitor to determine when desired objectives of deferment are met. Does not include the purpose of deferment for the establishment of forages.

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use has a negative impact on pasture condition, as well as soil and water resources. Inefficient use results in overgrazing, spot grazing, livestock trailing, concentration areas, uncontrolled access to streams and ponds, ephemeral erosion, gully erosion, stream bank erosion. Stocking rates are higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Scenario describes activities completed to restrict grazing for a defined period during the normal grazing period to provide benefits for invasive weed control, improvement in the health of the forage plants or providing cover for wildlife species. Activities include moving livestock to alternate locations, sampling and analyzing pasture condition, recordkeeping. Forgone Income used represents the acreage of usable forage not utilized during the deferment period as a proportion of the grazing season. Typical size of 80 acre pasture operation with 30 animal units where 75% of the acreage (or 60 acres) is deferred from grazing for 210 days. Costs and activities are typical for conventional and organic producers. Associated Practices: (511) Forage Harvest Management, (512) Forage and Biomass Planting, (590) Nutrient Management, (595) Integrated Pest Management, (561) Heavy Use Area Protection, (382) Fence, (614) Watering Facility, (378) Pond, (642) Water Well, (314) Brush Management, (315) Herbaceous Weed Control, (338) Prescribed Burning.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 60.0

**Scenario Total Cost:** $5,109.33

**Scenario Cost/Unit:** $85.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Trucking, moving livestock to new paddock | 961 | Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs. | Mile | $3.53 | 50 | $176.50 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 198 | $3,799.62 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| 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. | Hours | $24.46 | 16 | $391.36 |

**Practice:** 528 - Prescribed Grazing

**Scenario:** #8 - Biological Control with Grazing Animals

**Scenario Description:**

Management of herbaceous and/or woody plant species through the use of livestock such as goats, sheep or other grazing animal that will graze on the undesireable species. Payment is based on impacted acres only. Payment is based on the use of goats for problems where a stocking rate equivalent of 50 goats can adequately clear 1 acre of undesireable herbaceous species in one day (or equivalent stocking; for example 5 goats for 1 week to clear an acre), or equivalent number of other livestock. Costs are related to transportation of livestock, setting up temporary fencing and/or watering system. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

**Before Situation:**

Area consists of herbaceous and/or woody weed species such as, but not limited to sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, Amur cork tree, Siberian elm, callery pear, autumn olive, multiflora rose, barberry, burning bush, or honeysuckle, 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. Undesirable species can contribute to degraded plant condition, inadequate feed & forage, and potential animal health issues.

**After Situation:**

Livestock grazing is managed to limit the regrowth of weed species and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend and plant health and vigor is returning to near normal levels.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $543.68

**Scenario Cost/Unit:** $543.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Animals used for biological weed control | 1130 | Goats, Llamas, Sheep - Includes all support: fence, water, dog, mob, etc. Includes materials and shipping only. | Head per day | $6.96 | 50 | $348.00 |

**Practice:** 533 - Pumping Plant

**Scenario:** #1 - Wastewater Pump < 1 Hp

**Scenario Description:**

Scenario is for the implentation of a electric chopper screw pump of less than 1 horsepower. Implementation examples include, but are not limited to, pumping wastewater from the source to a storage facility such as in a dairy milk parlor, or pumping supernatant from the sump of a settling basin to a level spreader device upstream of a Vegetated Treatment Area, in flat topography where gravity flow from the settling basin is not feasible. Payment includes the pump and controls, installation and concrete pad base for the pump.

**Before Situation:**

Dairy milk parlor wastewater is not managed properly, or feedlot runoff enters a nearby stream, causing water quality concerns through excessive nutrients, organics, and pathogen. The resource concerns to be addressed are for water quality, air quality, and domestic animal health.

**After Situation:**

Practice typically installed for transfer of wastewater to a storage facility using 3/4 HP chopper/screw pump. Dairy milk parlor wastewater is directed to a waste storage facility, or feedlot runoff is directed to a solid/liquid settling basin, and supernatant is pumped from the sump of the settling basin to a Vegetated Treatment Area. Contaminated water no longer enters the stream. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices include: 374 - Farmstead Energy Improvement; 313 - Waste Storage Facility; 634 - Waste Transfer; 633 Waste Utilization; 632 Solid/liquid Waste Separation Facility; 635 Vegetated Treatment Area

**Feature Measure:** Per Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,366.39

**Scenario Cost/Unit:** $1,366.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Pump, Wastewater, Solids Handling < 1 HP | 2514 | Wastewater solid handling pump less than 1 horsepower. Pumping capacity of 20 gallons per minute at 30 feet of Total Dynamic Head. Includes materials and shipping only. | Each | $1,225.63 | 1 | $1,225.63 |

**Practice:** 533 - Pumping Plant

**Scenario:** #2 - Wastewater Pump 1-5 Hp

**Scenario Description:**

Scenario is for the implentation of a electric chopper screw pump of 1-5 horsepower. Implementation examples include, but are not limited to, pumping wastewater from the source to a storage facility such as in a dairy milk parlor, or pumping supernatant from the sump of a settling basin to a level spreader device upstream of a Vegetated Treatment Area, in flat topography where gravity flow from the settling basin is not feasible. Payment includes the pump and controls, installation and concrete pad base for the pump.

**Before Situation:**

Dairy milk parlor wastewater is not managed properly, or feedlot runoff enters a nearby stream, causing water quality concerns through excessive nutrients, organics, and pathogen. The resource concerns to be addressed are for water quality, air quality, and domestic animal health.

**After Situation:**

Practice typically installed for transfer of wastewater to a storage facility using 3 HP chopper/screw pump. Dairy milk parlor wastewater is directed to a waste storage facility, or feedlot runoff is directed to a solid/liquid settling basin, and supernatant is pumped from the sump of the settling basin to a Vegetated Treatment Area. Contaminated water no longer enters the stream. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices include: 374 - Farmstead Energy Improvement; 313 - Waste Storage Facility; 634 - Waste Transfer; 633 Waste Utilization; 632 Solid/liquid Waste Separation Facility; 635 Vegetated Treatment Area

**Feature Measure:** Per Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,574.05

**Scenario Cost/Unit:** $3,574.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Pump, Wastewater, Solids Handling, 1 to 5 HP | 2515 | Wastewater solid handling pump with 1 to 5 horsepower. Pumping capacity of 100 gallons per minute at 30 feet of Total Dynamic Head. Includes materials and shipping only. | Each | $3,433.29 | 1 | $3,433.29 |

**Practice:** 533 - Pumping Plant

**Scenario:** #3 - Manure Pump >5 Hp

**Scenario Description:**

Scenario is for the implentation of a electric chopper screw pump of >5 horsepower to pump manure from the source to a storage facility. Implementation examples include, but are not limited to, situations where a dairy or swine operation is pumping manure to an above ground storage facility. Payment includes the pump and controls, installation and concrete pad.

**Before Situation:**

Manure is not managed properly, or feedlot runoff enters a nearby stream, causing water quality concerns through excessive nutrients, organics, and pathogen. The resource concerns to be addressed are for water quality, air quality, and domestic animal health.

**After Situation:**

Practice typically installed for transfer of manure to a storage facility using 10 HP chopper/screw pump. Manure is directed to a waste storage facility, or feedlot runoff is directed to a solid/liquid settling basin, and supernatant is pumped from the sump of the settling basin to a Vegetated Treatment Area. Contaminated water no longer enters the stream. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices include: 374 - Farmstead Energy Improvement; 313 - Waste Storage Facility; 634 - Waste Transfer; 633 Waste Utilization; 632 Solid/liquid Waste Separation Facility; 635 Vegetated Treatment Area

**Feature Measure:** Per Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,481.34

**Scenario Cost/Unit:** $7,481.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Pump, Wastewater, Solids Handling, > 5 HP | 2516 | Wastewater solid handling pump greater than 5 horsepower. Pumping capacity of 400 gallons per minute at 40 feet of Total Dynamic Head. Includes materials and shipping only. | Each | $7,340.58 | 1 | $7,340.58 |

**Practice:** 533 - Pumping Plant

**Scenario:** #4 - Small Wastewater Fuel Driven Pump <= 50 Hp

**Scenario Description:**

Scenario is for the implentation of a fuel or PTO-driven pump of ≤ 50 horsepower for transferring manure or wastewater. Implementation examples include, but are not limited to, pumping wastewater from a storage facility to an end use such as a field, or transferring manure and wastewater from a shallow pit under a hog confinement building to a deep pit manure storage on the headquarters site. Payment includes all controls and appurtenances needed to mount the pump and connect the pump to the piping system. The piping system and any associated reception tank is specified under 634 - Waste Transfer.

**Before Situation:**

Various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues. Resource concerns are water quality degradation - excess nutrients in surface and ground waters.

**After Situation:**

For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system. Associated Practices include: 374 - Farmstead Energy Improvement; 313 - Waste Storage Facility; 634 - Waste Transfer

**Feature Measure:** Per Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $24,479.84

**Scenario Cost/Unit:** $24,479.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $609.70 | 40 | $24,388.00 |

**Practice:** 533 - Pumping Plant

**Scenario:** #5 - Large Wastewater Fuel Driven Pump > 50 Hp

**Scenario Description:**

Scenario is for the implentation of a fuel or PTO-driven pump of >50 horsepower for transferring manure or wastewater. Implementation examples include, but are not limited to, moving wastewater from a waste holding pond to a dragline field application system, supplying wastewater to a sprinkler irrigation system, or any other transfer of wasterwater from a storage facility to an end use. Includes all controls and appurtenances needed to mount the pump and connect the pump to the piping system. The piping system and any associated reception tank is specified under 634 - Waste Transfer.

**Before Situation:**

Various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues. Resource concerns are water quality degradation - excess nutrients in surface and ground waters.

**After Situation:**

For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system. Associated Practices include: 374 - Farmstead Energy Improvement; 313 - Waste Storage Facility; 634 - Waste Transfer

**Feature Measure:** Per Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $51,110.54

**Scenario Cost/Unit:** $51,110.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **Materials** | | | | | | |
| Pump, > 70 HP, Pump & ICE power unit | 1029 | Materials, labor, controls: > 70 HP Pump & ICE power unit | Horsepower | $600.22 | 85 | $51,018.70 |

**Practice:** 533 - Pumping Plant

**Scenario:** #6 - Irrigation Pump

**Scenario Description:**

The practice is installed to pump irrigation water from the source to a final destination. Payment includes the pump and controls, installation and concrete pad.

**Before Situation:**

Practice to be installed for management of irrigation water. Conditions include inefficent energy use due to age and type of irrigation pump, poor plant condition, and poor plant health. The resource concerns to be addressed are for inefficient energy use - equipment and facilities, water quality, water quantity, plant condition, and plant health.

**After Situation:**

Practice typically installed for transfer of irrigation water to a final destination using 50 HP pump. Conservation benefits of the installation are improved efficiency for the delivery of irrigation water. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: 430 Irrigation Pipeline, 442 Irrigation System - Sprinkler, 449 Irrigation Water Management, 590 nutrient management, 595 integrated pest management; 374-Farmstead Energy Improvement

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $30,576.84

**Scenario Cost/Unit:** $30,576.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $609.70 | 50 | $30,485.00 |

**Practice:** 533 - Pumping Plant

**Scenario:** #7 - Microirrigation Pump

**Scenario Description:**

The practice is installed to pump irrigation water from the source to a final destination for a micro irrigation system. Payment includes the pump and controls, installation and concrete pad.

**Before Situation:**

Practice to be installed for management of irrigation water. Conditions include inefficency of irrigation pump due to age and type, poor plant condition, and poor plant health. The resource concerns to be addressed are for water quality, water quantity, plant condition, and plant health.

**After Situation:**

Practice typically installed for transfer of irrigation water to a final destination using 1 HP pump. Conservation benefits of the installation are improved efficiency for the delivery of irrigation water. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: 430 Irrigation Pipeline, 441 Irrigation System - Microirrigation, 449 Irrigation Water Management, 590 nutrient management, 595 integrated pest management; 374-Farmstead Energy Improvement

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,887.28

**Scenario Cost/Unit:** $1,887.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.25 | $91.84 |
| **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. | Hours | $24.46 | 3 | $73.38 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1 | $353.92 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $348.67 | 1 | $348.67 |

**Practice:** 533 - Pumping Plant

**Scenario:** #8 - Solar Pump for Shallow Well or Spring Development

**Scenario Description:**

The scenario is for the installation of a solar panel array, pump, pressure tank, and appurtenances in a shallow well or spring development for supplying water to livestock in situations where standard electric power is inaccessible The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Payment does not include battery backup.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site conditions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

The typical scenario assumes installation of a 200-watt photovoltaic (PV) panel. The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Associated Practices include: 516 - Livestock Pipeline; 642 Water Well, 528 Prescribed Grazing and, 614 - Watering Facility.

**Feature Measure:** Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,289.23

**Scenario Cost/Unit:** $2,289.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 3 | $73.38 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 0.25 | $88.48 |
| 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 | $273.31 | 1 | $273.31 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $348.67 | 1 | $348.67 |
| 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 | $2,429.59 | 0.2 | $485.92 |

**Practice:** 533 - Pumping Plant

**Scenario:** #9 - Solar Pump for Pond

**Scenario Description:**

The scenario is for the installation of a solar panel array, and pump from a pond for supplying water to livestock in situations where standard electric power is inaccessible The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Payment does not include battery backup.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

The typical scenario assumes installation of a 200-watt photovoltaic (PV) panel. The installation includes the pump, wiring, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing pond at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Associated Practices include: 516 - Livestock Pipeline; 528 Prescribed Grazing and, 614 - Watering Facility.

**Feature Measure:** Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,916.10

**Scenario Cost/Unit:** $1,916.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 0.25 | $88.48 |
| 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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.2 | $485.92 |

**Practice:** 533 - Pumping Plant

**Scenario:** #10 - Livestock Water, Shallow Well Pump (<= 25 ft deep)

**Scenario Description:**

The scenario is for the installation of a pump and pressure tank in a shallow well (≤ 25 feet deep) or collection for supplying water to livestock. Payment includes pump, controls, pressure tank and installation.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a centrifigal pump, pressure tank, and appurtenances for a shallow draw watering system. Conservation benefits of the installation is proper grazing distribution, which will allow a degraded site to be restored. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well; 574 Spring Development

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,795.44

**Scenario Cost/Unit:** $1,795.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 3 | $73.38 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1 | $353.92 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $348.67 | 1 | $348.67 |

**Practice:** 533 - Pumping Plant

**Scenario:** #11 - Livestock Water, Shallow Well Pump (<= 25ft deep) with Above Ground Pump House

**Scenario Description:**

The scenario is for the installation of a pump and pressure tank in a shallow well (≤25 feet deep) or collection for supplying water to livestock. Payment includes pump, controls, pressure tank and installation. Payment also includes a pump house installed above ground for situations where there is not an existing sheltered location for the pump to be installed.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a centrifigal pump, pressure tank, and appurtenances for a shallow draw watering system. A 5' x 4' x 5' (100 cu ft) prefabricated concrete above ground pump house is installed above ground on a 8' x 8' x 1' gravel pad. An above ground pump house is utilized where burying is not feasible in a cost effective manner due to shallow soils. Conservation benefits of the installation is proper grazing distribution, which will allow a degraded site to be restored. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well; 574 Spring Development.

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,804.46

**Scenario Cost/Unit:** $2,804.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 7 | $171.22 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 2.4 | $73.68 |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1 | $353.92 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $348.67 | 1 | $348.67 |
| Pump House, Above Ground | 2470 | Above ground prefabricated pump house. Includes material and shipping only. | Each | $837.50 | 1 | $837.50 |

**Practice:** 533 - Pumping Plant

**Scenario:** #12 - Livestock Water, Shallow Well Pump (<= 25 ft deep) with Buried Pump House

**Scenario Description:**

The scenario is for the installation of a pump and pressure tank in a shallow well (≤ 25 feet deep) or collection for supplying water to livestock. Payment includes pump, controls, pressure tank and installation. Payment also includes a buried pump house for situations where there is not an existing sheltered location for the pump to be installed.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a centrifigal pump, pressure tank, and appurtenances for a shallow draw watering system. A 160 cu ft concrete well house is buried. A buried pump house is utilized where the ground is such that burying is not difficult and the climate conditions warrant burying for improved protection. Conservation benefits of the installation is proper grazing distribution, which will allow a degraded site to be restored. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well; 574 Spring Development.

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,187.96

**Scenario Cost/Unit:** $4,187.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 3 | $321.18 |
| **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. | Hours | $24.46 | 7 | $171.22 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 3 | $90.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 1 | $30.70 |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1 | $353.92 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $348.67 | 1 | $348.67 |
| Pumping Plant Pit, Concrete, 1200 Gallon | 1922 | Precast concrete septic tank structure, 1200 gal capacity, with access port and ladder. Materials only. | Each | $1,602.34 | 1 | $1,602.34 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 533 - Pumping Plant

**Scenario:** #13 - Livestock Water, Deep Well Pump (>25 ft deep)

**Scenario Description:**

The scenario is for the installation of a pump and pressure tank in a deep well (> 25 feet) for supplying water to livestock. Payment includes pump, controls, pressure tank and installation.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a jet or submersible pump, pressure tank, and appurtenances for a watering system. When utilizing a pond or stream a sump will be installed and used rather than a well. Conservation benefits of the installation is proper grazing distribution, which will allow a degraded site to be restored. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,103.81

**Scenario Cost/Unit:** $2,103.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 3 | $73.38 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1.5 | $530.88 |
| Pressure Tank, 80 gallon | 1039 | Pressure Tank, 80 gallon. Includes materials and shipping only. | Each | $480.08 | 1 | $480.08 |

**Practice:** 533 - Pumping Plant

**Scenario:** #14 - Livestock Water, Deep Well Pump (> 25ft deep) with Above Ground Pump House

**Scenario Description:**

The scenario is for the installation of a pump and pressure tank in a deep well (> 25 feet) for supplying water to livestock. Payment includes pump, controls, pressure tank and installation. Payment also includes a pump house installed above ground for situations where there is not an existing sheltered location for the pump to be installed.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a jet or submersible pump, pressure tank, and appurtenances for a watering system. A 5' x 4' x 5' (100 cu ft) prefabricated concrete above ground pump house is installed above ground on a 8' x 8' x 1' gravel pad. An above ground pump house is utilized where burying is not feasible in a cost effective manner due to shallow soils. Conservation benefits of the installation is proper grazing distribution, which will allow a degraded site to be restored. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,112.83

**Scenario Cost/Unit:** $3,112.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 7 | $171.22 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 2.4 | $73.68 |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1.5 | $530.88 |
| Pressure Tank, 80 gallon | 1039 | Pressure Tank, 80 gallon. Includes materials and shipping only. | Each | $480.08 | 1 | $480.08 |
| Pump House, Above Ground | 2470 | Above ground prefabricated pump house. Includes material and shipping only. | Each | $837.50 | 1 | $837.50 |

**Practice:** 533 - Pumping Plant

**Scenario:** #15 - Livestock Water, Deep Well Pump (> 25 ft deep) with Buried Pump House

**Scenario Description:**

The scenario is for the installation of a pump and pressure tank in a deep well (> 25 feet) for supplying water to livestock. Payment includes pump, controls, pressure tank and installation. Payment also includes a buried pump house for situations where there is not an existing sheltered location for the pump to be installed. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a jet or submersible pump, pressure tank, and appurtenances for a watering system. A 160 cu ft concrete well house is buried. A buried pump house is utilized where the ground is such that burying is not difficult and the climate conditions warrant burying for improved protection. Conservation benefits of the installation is proper grazing distribution, which will allow a degraded site to be restored. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,488.90

**Scenario Cost/Unit:** $4,488.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 3 | $321.18 |
| **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. | Hours | $24.46 | 7 | $171.22 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 3 | $90.18 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 1.5 | $530.88 |
| Pressure Tank, 80 gallon | 1039 | Pressure Tank, 80 gallon. Includes materials and shipping only. | Each | $480.08 | 1 | $480.08 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 1 | $23.27 |
| Pumping Plant Pit, Concrete, 1200 Gallon | 1922 | Precast concrete septic tank structure, 1200 gal capacity, with access port and ladder. Materials only. | Each | $1,602.34 | 1 | $1,602.34 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 533 - Pumping Plant

**Scenario:** #16 - Pump with Sump

**Scenario Description:**

The scenario is for the installation of a pump, pressure tank, and sump that supplies a dependable water supply to livestock from a pond, stream, or spring development.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site condtions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

Practice typically installed for 30 animal units and consists of installing a pump, pressure tank, sump, and appurtenances for a watering system from a pond or stream or spring development. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated Practices: 528 Prescribed Grazing, 516 Pipeline, 614 Watering Facility, 642 Water Well

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,103.58

**Scenario Cost/Unit:** $4,103.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 5 | $156.45 |
| **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. | Hours | $24.46 | 3 | $73.38 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 10 | $307.00 |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 0.25 | $88.48 |
| Pressure Tank, 80 gallon | 1039 | Pressure Tank, 80 gallon. Includes materials and shipping only. | Each | $480.08 | 1 | $480.08 |
| Pumping Plant Pit, Concrete, 1200 Gallon | 1922 | Precast concrete septic tank structure, 1200 gal capacity, with access port and ladder. Materials only. | Each | $1,602.34 | 1 | $1,602.34 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 533 - Pumping Plant

**Scenario:** #17 - Milk Transfer Pump

**Scenario Description:**

The typical scenario is for the installation of a 1 HP motor and transfer pump with appurtances, used in a dairy milking system to transfer milk from the milk receiver to the bulk tank. The motor will be used in conjunction with a VSD. This practice is to be used exclusively for implementing recommendations from on-farm energy audits. Payment includes pump, controlls 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 more efficient motor and pump combination. A VSD will be used with the motor/pump combination so that 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, 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. Associated Practice: 374 Farmstead Energy Improvement

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $728.10

**Scenario Cost/Unit:** $728.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Pump, Transfer, 1 HP, Pump and Motor | 2472 | Transfer pump with a 1 horsepower, 3 phase motor. Includes materials only. | Each | $728.10 | 1 | $728.10 |

**Practice:** 533 - Pumping Plant

**Scenario:** #18 - Vacuum Pump

**Scenario Description:**

The typical scenario is for the installation of a 10 HP motor and vacuum pump with appurtances, used in a dairy milking system to transfer the milk from the animal to the milk receiver. The motor will be used in conjunction with a VSD. This practice is to be used exclusively for implementing recommendations from on-farm energy audits. Payment includes pump, controlls 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 more efficient motor and pump combination. A VSD will be used with the motor/pump combination so that 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, 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. Associated Practice: 374 Farmstead Energy Improvement

**Feature Measure:** per pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,996.65

**Scenario Cost/Unit:** $5,996.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Pump, Vacuum, 10 HP, Pump and Motor | 2473 | Vacuum pump including a 10 horsepower, 3 phase motor. Includes materials only. | Each | $5,996.65 | 1 | $5,996.65 |

**Practice:** 533 - Pumping Plant

**Scenario:** #62 - Solar Pump for Deep Well

**Scenario Description:**

The scenario is for the installation of a solar panel array, pump, and appurtenances in a deep well for supplying water to livestock is situations where standard electric power is inaccessible. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Payment does not include battery backup.

**Before Situation:**

Practice to be installed on grazing land. Current conditions include inadequate water supply, poor water quality, degraded site conditions leading to erosion concerns, poor grazing distribution, and poor livestock health. The resource concerns to be addressed are Inadequate supply of water, grazing distribution, and degraded site conditions leading to poor animal health.

**After Situation:**

The typical scenario assumes installation of a 500-watt photovoltaic (PV) panel. Pump TDH 200ft at 5 gallon per minute. The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Associated Practices include: 516 - Livestock Pipeline; 642 Water Well, 528 Prescribed Grazing and, 614 - Watering Facility.

**Feature Measure:** Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,394.62

**Scenario Cost/Unit:** $7,394.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 8 | $195.68 |
| **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 | $273.31 | 1 | $273.31 |
| 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 | $2,429.59 | 0.5 | $1,214.80 |
| Pump House, Above Ground | 2470 | Above ground prefabricated pump house. Includes material and shipping only. | Each | $837.50 | 1 | $837.50 |
| Solar Pumping System, Fixed Cost Portion | 2495 | Fixed cost portion of a solar powered pumping system. This portion is a base cost for a complete system including the photovoltaic panels, pumping plant, support braces, electric controllers, service drop, etc., and is not dependant on KiloWatt. The total cost will include this fixed cost plus a variable cost portion. Includes the cost of materials only. | Each | $3,589.31 | 1 | $3,589.31 |
| Solar Pumping System, Variable Cost Portion | 2496 | Variable cost portion of a solar powered pumping system. This portion IS dependent upon the total kilowatts of the photovoltaic panels, but also includes the pumping plant, support braces, electric controllers, service drop, etc. The total cost will include this variable cost plus a fixed cost portion. Includes the cost of materials only. | Kilowatt | $2,568.04 | 0.5 | $1,284.02 |

**Practice:** 533 - Pumping Plant

**Scenario:** #63 - Livestock Non-Electric Pump

**Scenario Description:**

A non-electric pump (nose pump, sling pump, water ram, etc.) is located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one pump is adequate for 20 cattle. Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

**Before Situation:**

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing distribution, over grazing, and soil erosion.

**After Situation:**

One non electric pump is installed with all appurtenances anchored to concrete pad with 6"x6"x10 Gauge reinforcement wire (9 ft x 4 ft x 5 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad. Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

**Feature Measure:** Number of Pumps

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,316.48

**Scenario Cost/Unit:** $1,316.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 0.5 | $183.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Nose Pump | 1052 | Materials and delivery. | Each | $412.24 | 1 | $412.24 |

**Practice:** 533 - Pumping Plant

**Scenario:** #67 - Windmill-Powered Pump

**Scenario Description:**

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed. Resource Concerns: Insufficient stockwater.

**Before Situation:**

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

**After Situation:**

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

**Feature Measure:** Diameter of Mill Wheel

**Scenario Unit:** Feet

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $10,636.14

**Scenario Cost/Unit:** $1,063.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 2 | $734.72 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Aerial lift, telescoping bucket | 1893 | Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only. | Hours | $37.54 | 8 | $300.32 |
| **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. | Hours | $24.46 | 32 | $782.72 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| **Materials** | | | | | | |
| Windmill, 10 ft. fan diameter | 1036 | Includes materials costs for windmill head and 27 foot tower | Each | $7,552.10 | 1 | $7,552.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 554 - Drainage Water Management

**Scenario:** #1 - >10 Acres per Structure

**Scenario Description:**

This scenario describes the management of a drainage water system in a row crop field with subsurface drainage system already installed or planned to be installed with control structures, or a surface water management system with berms or levees around the field and control structures. Drainage conditions consist of gentle slopes with few variations in drainage characteristics and surface slopes. Subsurface drainage pattern consists of fewer secondary main lines. Implementation of DWM results in improved water quality by reducing nutrient losses from the soil through ground or surface water outside of the growing season. Management of the water table results in more ground water available for crops during the growing season while lowering the water table prior to crop planting and crop harvest to avoid causing compaction.

**Before Situation:**

In this scenario the gently sloping cropland is drained with pattern subsurface drainage (typically perforated corrugated plastic tubing). The purpose of the drainage system is to decrease soil moisture conditions during planting and harvesting of crop. Subsurface drainage is not restricted at anytime during the year resulting in a permanently lowered water table which is typically 3-4 feet below the surface and well below the crop root zone. Excess ground water is discharged directly to adjacent receiving streams. Excess subsurface drainage contributes to degraded water quality from excessive nutrient discharge; less vigorous crop growth from lowered water table.

**After Situation:**

Typical systems consist of a 75 acre field with existing drainage tile lines and 5 installed water control structures. The operator walks the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures.Scenario includes the cost of participant attending a workshop to gain knowledge about implementing the practice. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Insufficient Water - Insufficient Moisture Management. Associated Practices: 329:Residue Management - No Till/Strip Till; 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

**Feature Measure:** Acres of Managed Drainage

**Scenario Unit:** Acres

**Scenario Typical Size:** 75.0

**Scenario Total Cost:** $472.35

**Scenario Cost/Unit:** $6.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 15 | $472.35 |

**Practice:** 554 - Drainage Water Management

**Scenario:** #2 - >10 acres per Structure with Training

**Scenario Description:**

This scenario describes the management of a drainage water system in a row crop field with subsurface drainage system already installed or planned to be installed with control structures, or a surface water management system with berms or levees around the field and control structures. Drainage conditions consist of gentle slopes with few variations in drainage characteristics and surface slopes. Subsurface drainage pattern consists of fewer secondary main lines. Implementation of DWM results in improved water quality by reducing nutrient losses from the soil through ground or surface water outside of the growing season. Management of the water table results in more ground water available for crops during the growing season while lowering the water table prior to crop planting and crop harvest to avoid causing compaction.

**Before Situation:**

In this scenario the gently sloping cropland is drained with pattern subsurface drainage (typically perforated corrugated plastic tubing). The purpose of the drainage system is to decrease soil moisture conditions during planting and harvesting of crop. Subsurface drainage is not restricted at anytime during the year resulting in a permanently lowered water table which is typically 3-4 feet below the surface and well below the crop root zone. Excess ground water is discharged directly to adjacent receiving streams. Excess subsurface drainage contributes to degraded water quality from excessive nutrient discharge; less vigorous crop growth from lowered water table.

**After Situation:**

Typical systems consist of a 75 acre field with existing drainage tile lines and 5 installed water control structures. The operator walks the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures.Scenario includes the cost of participant attending a workshop to gain knowledge about implementing the practice. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Insufficient Water - Insufficient Moisture Management. Associated Practices: 329:Residue Management - No Till/Strip Till; 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

**Feature Measure:** Acres of Managed Drainage

**Scenario Unit:** Acres

**Scenario Typical Size:** 75.0

**Scenario Total Cost:** $581.60

**Scenario Cost/Unit:** $7.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **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. | Hours | $31.49 | 15 | $472.35 |

**Practice:** 554 - Drainage Water Management

**Scenario:** #3 - <=10 Acres per Structure

**Scenario Description:**

This scenario describes the management of a drainage water system in a row crop field with subsurface drainage system already installed or planned to be installed with control structures, or a surface water management system with berms or levees around the field and control structures. Drainage conditions consist of gentle to moderately slopes with many variations in drainage characteristics and surface slopes. Subsurface drainage pattern consists of many secondary main lines due to changes in drainage patterns. Implementation of DWM results in improved water quality by reducing nutrient losses from the soil through ground or surface water outside of the growing season. Management of the water table results in more ground water available for crops during the growing season while lowering the water table prior to crop planting and crop harvest to avoid causing compaction.

**Before Situation:**

In this scenario the gently to moderately sloping cropland is drained with pattern subsurface drainage (typically perforated corrugated plastic tubing). The purpose of the drainage system is to decrease soil moisture conditions during planting and harvesting of crop. Subsurface drainage is not restricted at anytime during the year resulting in a permanently lowered water table which is typically 3-4 feet below the surface and well below the crop root zone. Excess ground water is discharged directly to adjacent receiving streams. Excess subsurface drainage contributes to degraded water quality from excessive nutrient discharge; less vigorous crop growth from lowered water table.

**After Situation:**

Typical systems consist of a 50 acre field with existing drainage tile lines and 5 installed water control structures. The operator walks the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Insufficient Water - Insufficient Moisture Management. Associated Practices: 329:Residue Management - No Till/Strip Till; 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

**Feature Measure:** Acres of Managed Drainage

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $472.35

**Scenario Cost/Unit:** $9.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 15 | $472.35 |

**Practice:** 554 - Drainage Water Management

**Scenario:** #4 - <=10 acres per Structure with Training

**Scenario Description:**

This scenario describes the management of a drainage water system in a row crop field with subsurface drainage system already installed or planned to be installed with control structures, or a surface water management system with berms or levees around the field and control structures. Drainage conditions consist of gentle to moderately slopes with many variations in drainage characteristics and surface slopes. Subsurface drainage pattern consists of many secondary main lines due to changes in drainage patterns. Implementation of DWM results in improved water quality by reducing nutrient losses from the soil through ground or surface water outside of the growing season. Management of the water table results in more ground water available for crops during the growing season while lowering the water table prior to crop planting and crop harvest to avoid causing compaction.

**Before Situation:**

In this scenario the gently to moderately sloping cropland is drained with pattern subsurface drainage (typically perforated corrugated plastic tubing). The purpose of the drainage system is to decrease soil moisture conditions during planting and harvesting of crop. Subsurface drainage is not restricted at anytime during the year resulting in a permanently lowered water table which is typically 3-4 feet below the surface and well below the crop root zone. Excess ground water is discharged directly to adjacent receiving streams. Excess subsurface drainage contributes to degraded water quality from excessive nutrient discharge; less vigorous crop growth from lowered water table.

**After Situation:**

Typical systems consist of a 50 acre field with existing drainage tile lines and 5 installed water control structures. The operator walks the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Insufficient Water - Insufficient Moisture Management. Associated Practices: 329:Residue Management - No Till/Strip Till; 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

**Feature Measure:** Acres of Managed Drainage

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $581.60

**Scenario Cost/Unit:** $11.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **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. | Hours | $31.49 | 15 | $472.35 |

**Practice:** 558 - Roof Runoff Structure

**Scenario:** #1 - Roof Gutter, Small

**Scenario Description:**

A gutter-downspout system for the side of a 30'x70' livestock confinement building, to exclude clean water from the loafing area adjacent to the building. Roof area served by the 70' long gutter is 1,050 square feet. The gutter is a 5" K-type, with two 12' downspouts to convey the roof runoff to ground level. Underground outlets (CPS 620) are then utilized to safely outlet the water from the downspouts. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and/or Diversion (362) to capture flow from downspouts and route away from contaminated areas as needed.

**Before Situation:**

Runoff water from the roof of the livestock confinement building falls onto the loafing area. The addition of extra water to the contaminated surface creates additional contaminated wastewater which runs off into nearby surface waters, increasing the magnitude of the existing water quality resource concern and increasing the volume of material that would need to be collected, stored, treated and land applied in a waste management system.

**After Situation:**

A gutter-downspout system has been installed on the side of the building adjacent to the loafing area, routing the clean water away from the contaminated surface, and reducing the volume of contaminated runoff from the loafing area.

**Feature Measure:** Linear Length of Roof to be Drained

**Scenario Unit:** Feet

**Scenario Typical Size:** 70.0

**Scenario Total Cost:** $674.26

**Scenario Cost/Unit:** $9.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 4.67 | $114.23 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.58 | 16 | $105.28 |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter (4" to 6") in width with hangers. Materials only. | Feet | $3.31 | 70 | $231.70 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $2.28 | 24 | $54.72 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 558 - Roof Runoff Structure

**Scenario:** #2 - Roof Gutter, Medium

**Scenario Description:**

A gutter-downspout system for the side of a 70'x140' livestock confinement building, to exclude clean water from the loafing area adjacent to the building. Roof area served by the 140' long gutter is 4,900 square feet. The gutter is a 7" K-type, with two 12' downspouts to convey the roof runoff to ground level. Underground outlets (CPS 620) are then utilized to safely outlet the water from the downspouts. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and/or Diversion (362) to capture flow from downspouts and route away from contaminated areas as needed.

**Before Situation:**

Runoff water from the roof of the livestock confinement building falls onto the loafing area. The addition of extra water to the contaminated surface creates additional contaminated wastewater which runs off into nearby surface waters, increasing the magnitude of the existing water quality resource concern and increasing the volume of material that would need to be collected, stored, treated and land applied in a waste management system.

**After Situation:**

A gutter-downspout system has been installed on the side of the building adjacent to the loafing area, routing the clean water away from the contaminated surface, and reducing the volume of contaminated runoff from the loafing area.

**Feature Measure:** Linear Length of Roof to be Drained

**Scenario Unit:** Feet

**Scenario Typical Size:** 140.0

**Scenario Total Cost:** $1,900.87

**Scenario Cost/Unit:** $13.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 7 | $171.22 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $9.90 | 16 | $158.40 |
| Gutter, Aluminum, Medium | 1690 | Aluminum gutter (7" to 9") in width with hangers. Materials only. | Feet | $9.63 | 140 | $1,348.20 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $2.28 | 24 | $54.72 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 558 - Roof Runoff Structure

**Scenario:** #3 - Roof Gutter, Large

**Scenario Description:**

A gutter-downspout system for the side of a 160'x220' livestock confinement building, to exclude clean water from the loafing area adjacent to the building. Roof area served by the 220' long gutter is 17,600 square feet. The gutter is 11", with two 12' downspouts to convey the roof runoff to ground level. Underground outlets (CPS 620) are then utilized to safely outlet the water from the downspouts. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and/or Diversion (362) to capture flow from downspouts and route away from contaminated areas as needed.

**Before Situation:**

Runoff water from the roof of the livestock confinement building falls onto the loafing area. The addition of extra water to the contaminated surface creates additional contaminated wastewater which runs off into nearby surface waters, increasing the magnitude of the existing water quality resource concern and increasing the volume of material that would need to be collected, stored, treated and land applied in a waste management system.

**After Situation:**

A gutter-downspout system has been installed on the side of the building adjacent to the loafing area, routing the clean water away from the contaminated surface, and reducing the volume of contaminated runoff from the loafing area.

**Feature Measure:** Linear Length of Roof to be Drained

**Scenario Unit:** Feet

**Scenario Typical Size:** 220.0

**Scenario Total Cost:** $3,693.11

**Scenario Cost/Unit:** $16.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 11 | $269.06 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $9.90 | 16 | $158.40 |
| Gutter, Aluminum, Large | 1691 | Aluminum gutter (10" to 12") in width with hangers. Materials only. | Feet | $13.83 | 220 | $3,042.60 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $2.28 | 24 | $54.72 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 558 - Roof Runoff Structure

**Scenario:** #4 - Rock Trench Drain

**Scenario Description:**

An aggregate-filled infiltration trench lined with geotextile, 3 ft wide by 2 ft deep, is placed on each side of a 40' x 100' hoop structure storing feedstock at the headquarters site of a confined livestock operation, to exclude roof runoff from contaminated lot surfaces. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. This scenario is to be used where environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters- dictate the use of the trench drain. May be used to prevent roof runoff from causing erosion or ponding of water adjacent to a seasonal high tunnel, benefitting water quality, water quantity, and soil erosion. In situations where the roof runoff will not properly infiltrate the soil, a subsurface drain system will be installed using 606 - Subsurface Drain. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Seasonal High Tunnel (798), Subsurface Drain (606), and Diversion (362).

**Before Situation:**

Runoff water from the roof of the hoop structure enters the lot. The addition of extra water to the contaminated surface creates additional contaminated wastewater which runs off into nearby surface waters, increasing the magnitude of the existing water quality resource concern and increasing the volume of material that would need to be collected, stored, treated and land applied in a waste management system.

**After Situation:**

An aggregate-filled infiltration trench lined with geotextile is placed on each side of the hoop structure. Runoff from the roof of the structure enters the infiltration trench and drains off site to a stable outlet through a subsurface drain. The volume of contaminated water at the confinement site is reduced.

**Feature Measure:** Linear Length of Roof to be Drained

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $1,850.63

**Scenario Cost/Unit:** $9.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 158 | $205.40 |
| 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 Yards | $2.12 | 45 | $95.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 45 | $1,381.50 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 558 - Roof Runoff Structure

**Scenario:** #12 - Concrete Channel with Wall

**Scenario Description:**

A roof runoff structure, consisting of a concrete wall with concrete channel installed on existing impervious surface or the ground with appropriate outlet facilities. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of an on-ground concrete wall. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A concrete wall with channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete wall (2’ high) with an adjacent 4’ wide concrete channel extending the length of a 200' roof with additional length (5') for stable outlet.

**Feature Measure:** Linear Length of Roof to be Curbed

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $14,919.66

**Scenario Cost/Unit:** $74.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 7 | $2,571.52 |
| 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 Yards | $487.76 | 23 | $11,218.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 15 | $168.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 15 | $460.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 558 - Roof Runoff Structure

**Scenario:** #20 - Roof Gutter, 6 inches wide with runoff Storage Tank

**Scenario Description:**

A roof runoff structure, consisting of gutter(s), downspout(s), and a storage tank. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use of roof water and a stable outlet for any excess to ground surface in a way that avoids erosion. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A gutter and downspouts servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ln.ft. serviced with gutter, downspouts, and appurtances. A 1,500 gallon tank is installed for storage and use of roof runoff.

**Feature Measure:** Linear Length of Roof to be Guttere

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $3,004.54

**Scenario Cost/Unit:** $15.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 2 | $11.02 |
| **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. | Hours | $31.49 | 1 | $31.49 |
| 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. | Hours | $24.46 | 20 | $489.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 2 | $61.40 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $3.73 | 110 | $410.30 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $0.67 | 1500 | $1,005.00 |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter (4" to 6") in width with hangers. Materials only. | Feet | $3.31 | 200 | $662.00 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $2.28 | 60 | $136.80 |
| **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 | $168.33 | 1 | $168.33 |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.29 | 100 | $29.00 |

**Practice:** 560 - Access Road

**Scenario:** #1 - New gravel road, 6in, wet level terrain

**Scenario Description:**

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in relatively level ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

**After Situation:**

The single lane road will be graveled to a width of 10 feet , plus 2 foot shoulders for a total width of 14 feet wide. Gravel will be a minumum of 6 inches, underlain with geotextile fabric. It is mostly in embankment less than 3 feet in height, (average 1.5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $10,857.58

**Scenario Cost/Unit:** $10.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 1222 | $1,588.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 940 | $4,013.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 0.14 | $2.99 |
| **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. | Hours | $31.49 | 10 | $314.90 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 194 | $4,514.38 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.14 | $4.31 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 560 - Access Road

**Scenario:** #2 - New gravel road, 6in, dry level terrain

**Scenario Description:**

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in relatively level ground in dry areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively dry, but level terrain lands.

**After Situation:**

The single lane road will be graveled to a width of 10 feet , plus 2 foot shoulders for a total width of 14 feet wide. Gravel will be a minumum of 6 inches. It is mostly in embankment less than 3 feet in height, (average 1.5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $9,206.00

**Scenario Cost/Unit:** $9.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 940 | $4,013.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 0.14 | $2.99 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 194 | $4,514.38 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.14 | $4.31 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 560 - Access Road

**Scenario:** #3 - New gravel road, 8in x 10ft, wet level terrain

**Scenario Description:**

Newly Constructed 10 foot wide gravel road with min. 8 inch thick compacted gravel surface in relatively level ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

**After Situation:**

The single lane road will be graveled to a width of 10 feet, plus 2 foot shoulders for a total width of 14 feet wide. Gravel will be a minumum of 8 inches, underlain with geotextile fabric. It is mostly in embankment less than 3 feet in height, (average 1.5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $12,537.70

**Scenario Cost/Unit:** $12.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 1333 | $1,732.90 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 940 | $4,013.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 0.14 | $2.99 |
| **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. | Hours | $31.49 | 10 | $314.90 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 260 | $6,050.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.14 | $4.31 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 560 - Access Road

**Scenario:** #4 - New gravel road, 8in x 12ft, wet level terrain

**Scenario Description:**

Newly Constructed 12 foot wide gravel road with min. 8 inch thick compacted gravel surface in relatively level ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

**After Situation:**

The single lane road will be graveled to a width of 12 feet, plus 2 foot shoulders for a total width of 16 feet wide. Gravel will be a minumum of 8 inches, underlain with geotextile fabric. It is mostly in embankment less than 3 feet in height, (average 1.5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $14,636.29

**Scenario Cost/Unit:** $14.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 1556 | $2,022.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1060 | $4,526.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 0.14 | $2.99 |
| **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. | Hours | $31.49 | 12 | $377.88 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 313 | $7,283.51 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.14 | $4.31 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 560 - Access Road

**Scenario:** #5 - New gravel road, 8in x 16ft, wet level terrain

**Scenario Description:**

Newly Constructed 16 foot wide gravel road with min. 8 inch thick compacted gravel surface in relatively level ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

**After Situation:**

The road will be graveled to a width of 16 feet , plus 2 foot shoulders for a total width of 20 feet wide. Gravel will be a minumum of 8 inches, underlain with geotextile fabric. It is mostly in embankment less than 3 feet in height, (average 1.5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $19,204.63

**Scenario Cost/Unit:** $19.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 2389 | $3,105.70 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1280 | $5,465.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 0.14 | $2.99 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 417 | $9,703.59 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.14 | $4.31 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #1 - Concrete HUA

**Scenario Description:**

Installation of a concrete heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.

**Before Situation:**

A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.

**After Situation:**

The stabilization of areas frequently and intensively used by livestock by installing a concrete surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. The base consists of 4" of gravel. The concrete is a reinforced slab on grade with a thickness of 5". Payment incorporates site preparation through grading and shaping, concrete pad and gravel. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of reinforced concrete

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $24,285.48

**Scenario Cost/Unit:** $6.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 61 | $22,408.96 |
| 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 Yards | $2.12 | 72 | $152.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 48 | $1,473.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #2 - Geocell and Gravel HUA

**Scenario Description:**

Installation of a geocell and gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.

**Before Situation:**

A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion.

**After Situation:**

The stabilization of an area frequently and intensively used by people, animals or vehicles by installing a gravel surface with geocells to reduce soil erosion and improve livestock health. Typical size is 3900 square feet. 4" of gravel is placed into a 4" geocell "matting material" and surfaced with a 3" layer of fines. Payment incorporates site preparation through grading and shaping, gravel (7" depth total with gravel and fines) and geoweb "matting material". An additional 8 hours of general labor is added to put the geocells in place. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of rock-gravel GeoCell GeoTex

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $12,773.07

**Scenario Cost/Unit:** $3.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 72 | $152.64 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 85 | $2,609.50 |
| GeoCell, 4 inch | 1054 | 4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill | Square Yard | $22.09 | 433 | $9,564.97 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #3 - Fly Ash on Geotextile

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with Fly Ash on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation.

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 630 square feet of Fly Ash on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Fly Ash

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 630.0

**Scenario Total Cost:** $1,073.96

**Scenario Cost/Unit:** $1.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 70 | $91.00 |
| 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 Yards | $2.12 | 4 | $8.48 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 4 | $410.52 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Fly Ash, BAB | 52 | Fly Ash, Bottom Ash Blend, includes material and delivery | Cubic Yards | $24.18 | 8 | $193.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #4 - Bituminous Concrete Pavement

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with bituminous concrete pavement on aggregate gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation.

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 630 square feet of bituminous concrete pavement on 8 cubic yards of aggregate gravel material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Bituminous Pavement

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 630.0

**Scenario Total Cost:** $1,940.76

**Scenario Cost/Unit:** $3.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 4 | $8.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 8 | $245.60 |
| Asphalt, pavement | 1867 | Bituminous Concrete,includes materials, equipment and labor for 4 inch layer, base not included. | Square Feet | $2.28 | 630 | $1,436.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #5 - Winter Feeding station with gravel

**Scenario Description:**

Installation of a concrete (slab on grade over gravel) pad with reinforced concrete curbing, surrounded by gravel on three sides, to provide a stable, non-eroding surface, and allow for collection of manure, for areas frequently used by livestock.

**Before Situation:**

A 50 head cow/calf operation with an intensively used area in a pasture for winter feeding. This area is unstable with an eroding surface The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion.

**After Situation:**

The stabilization of areas frequently and intensively used by pastured livestock during winter feeding. A concrete (slab on grade over gravel) pad with reinforced concrete curbing, surrounded by gravel on three sides, to provide a stable, non-eroding surface, and allow for collection of manure, will be installed to reduce soil erosion, improve water quality, air quality, and livestock health. Typical total size is 4,324 square feet. There is a 2,624 square feet of reinforced slab on grade concrete, which is 5" thick. This concrete is placed over a 3" base of gravel. The 32'x 58' feeding area has formed concrete roll curbs to allow for capturing of animal waste. The 24' x 32' stacking area has 4' reinforced concrete walls to store captured animal waste. Approximately 1,700 square feet of gravel 8" thick placed over light geotextile fabric surrounds three sides of the concrete pad. Payment incorporates site preparation through grading and shaping, concrete pad and curbing and gravel. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of concrete and gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,324.0

**Scenario Total Cost:** $30,909.72

**Scenario Cost/Unit:** $7.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 29 | $10,653.44 |
| 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 Yards | $487.76 | 36 | $17,559.36 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 206 | $267.80 |
| 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 Yards | $2.12 | 72 | $152.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 66 | $2,026.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #6 - Winter Feeding Station

**Scenario Description:**

Installation of a concrete (slab on grade over gravel) pad with reinforced concrete curbing to provide a stable, non-eroding surface, and allow for collection of manure, for areas frequently used by livestock.

**Before Situation:**

A 50 head cow/calf operation with an intensively used area in a pasture for winter feeding. This area is unstable with an eroding surface The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion.

**After Situation:**

The stabilization of areas frequently and intensively used by pastured livestock during winter feeding. A concrete (slab on grade over gravel) pad with reinforced concrete curbing to provide a stable, non-eroding surface, and allow for collection of manure, will be installed to reduce soil erosion, improve water quality, air quality, and livestock health. Typical total size is 2,624 square feet. There is a 2,624 square feet of reinforced slab on grade concrete, which is 5" thick. This concrete is placed over a 3" base of gravel. The 32'x 58' feeding area has formed concrete roll curbs to allow for capturing of animal waste. The 24' x 32' stacking area has 4' reinforced concrete walls to store captured animal waste. Payment incorporates site preparation through grading and shaping, concrete pad and curbing. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of Concrete

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,624.0

**Scenario Total Cost:** $29,352.52

**Scenario Cost/Unit:** $11.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 29 | $10,653.44 |
| 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 Yards | $487.76 | 36 | $17,559.36 |
| 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 Yards | $2.12 | 72 | $152.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 24 | $736.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #7 - Gravel with Geotextile, Thick

**Scenario Description:**

Installation of a gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.

**Before Situation:**

A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.

**After Situation:**

The stabilization of areas frequently and intensively used by livestock by installing a gravel surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. Gravel, 8" deep, is placed over light geotextile fabric and surfaced with a 3" layer of fines. Payment incorporates site preparation through grading and shaping, gravel and layer of fines and light geotextile fabric. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $5,692.42

**Scenario Cost/Unit:** $1.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 433 | $562.90 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 6 | $615.78 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 133 | $4,083.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #8 - Gravel without Geotextile, Thick

**Scenario Description:**

Installation of a gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.

**Before Situation:**

A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.

**After Situation:**

The stabilization of areas frequently and intensively used by livestock by installing a gravel surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. Gravel, 8" deep,is surfaced with a 3" layer of fines. Payment incorporates site preparation through grading and shaping, gravel and layer of fines. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $5,129.52

**Scenario Cost/Unit:** $1.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 6 | $615.78 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 133 | $4,083.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #9 - Gravel with Geotextile, Regular Thickness

**Scenario Description:**

Installation of a gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.

**Before Situation:**

A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.

**After Situation:**

The stabilization of areas frequently and intensively used by livestock by installing a gravel surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. Gravel, 5" deep, is placed over light geotextile fabric and surfaced with a 2" layer of fines. Payment incorporates site preparation through grading and shaping, gravel and layer of fines and light geotextile fabric. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $4,218.82

**Scenario Cost/Unit:** $1.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 433 | $562.90 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 6 | $615.78 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 85 | $2,609.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario:** #10 - Gravel without Geotextile, Regular Thickness

**Scenario Description:**

Installation of a gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.

**Before Situation:**

A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.

**After Situation:**

The stabilization of areas frequently and intensively used by livestock by installing a gravel surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. Gravel, 5" deep,is surfaced with a 2" layer of fines. Payment incorporates site preparation through grading and shaping, gravel and layer of fines. Cost data is applicable to organic and conventional agricultural production systems.

**Feature Measure:** Area of gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $3,655.92

**Scenario Cost/Unit:** $0.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 6 | $615.78 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 85 | $2,609.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 570 - Stormwater Runoff Control

**Scenario:** #1 - Stormwater Runoff Control

**Scenario Description:**

This scenario involves installation of silt fence, straw wattles, coconut fabric mats or jute mats, and synthetic mats on the construction site as part of one conservation engineering system. The combined system shall include two or more components and will address the resource concerns related with concentrated flow erosion, excessive sediment in surface waters as well as protection of existing inlets and structures depending on the combination. This practice may also be used in the installation of rain gardens, permeable pavement, and/or bioswales.

**Before Situation:**

The combination scenario is applicable in all construction sites and watersheds. Which component would apply in a particular situation would depend on the site condition, slope etc.

**After Situation:**

When properly installed, the combination structures slow down runoff flow velocity and reduce high velocity erosion, detain and filter the stormwater runoff and provide a controlled release to the downstream areas. In seeded areas, straw wattles also enable seeds to settle and germinate, aiding the revegetation process. By filtering overland runoff and holding sediment on the slope, Straw Wattles also help to protect lakes, ponds, rivers and streams from sediment pollution. When properly installed, coconut mats slow and spread the overland water flow and provide a filtering effect. They also help to reduce sediment transport and stabilize the construction area. Silt fence are installed along the downstream perimeter of a construction site to prevent sediment transport off construction areas. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. All erosion control blankets and straw mulches will be covered under 484 - Mulching. If earthen basins are warranted for water quality improvement purposes, use Sediment Basin (350) or Dam (402) as appropriate. If seeding is warranted for water quality and erosion control purpose, use Critical Area Planting (342).

**Feature Measure:** Area of construction site

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,235.02

**Scenario Cost/Unit:** $1,235.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 480 | $624.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.5 | $35.51 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| 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. | Hours | $41.94 | 1.5 | $62.91 |
| **Materials** | | | | | | |
| Silt Fence | 43 | Silt Fence with support post. Includes materials, equipment and labor | Feet | $1.58 | 100 | $158.00 |
| Wattles, straw, 8-9 in. x 25 ft. | 1405 | Tubes of rice straw, approximately 8-9 inch in diameter, 25 feet long . Includes materials and shipping only (including stakes). | Feet | $1.09 | 100 | $109.00 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |

**Practice:** 570 - Stormwater Runoff Control

**Scenario:** #13 - Rain Garden

**Scenario Description:**

Typical Size: 36' x 30' area, 4-8" deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

**Before Situation:**

Stormwater is managed to prevent erosion from farmstead impervious surfaces and practice standard is met

**After Situation:**

Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

**Feature Measure:** square feet of rain garden

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,080.0

**Scenario Total Cost:** $995.86

**Scenario Cost/Unit:** $0.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 2 | $107.70 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 3 | $71.01 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| 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. | Hours | $41.94 | 3 | $125.82 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $65.00 | 0.3 | $19.50 |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 0.1 | $45.88 |
| Perennial Grass, Legume, and/or Forb Liners or Plugs, each | 2758 | Perennial grasses, legumes and/or forbs for small areas using vegetative propagules including liners or plugs. Includes materials and shipping. | Acres | $1.41 | 150 | $211.50 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 570 - Stormwater Runoff Control

**Scenario:** #14 - Combination, Most common Best Management Practices

**Scenario Description:**

This scenario involves installation of silt fence, straw wattles, and straw bales on the construction site as part of one conservation engineering system. The combined system shall include two or more components and will address the resource concerns related with concentrated flow erosion, excessive sediment in surface waters as well as protection of existing inlets and structures depending on the combination.

**Before Situation:**

The combination scenario is applicable in all construction sites and watersheds including those in the urban and suburban areas. Which component would apply in a particular situation would depend on the site condition, slope etc.

**After Situation:**

When properly installed, the combination structures slow down runoff flow velocity and reduce high velocity erosion, detain and filter the stormwater runoff and provide a controlled release to the downstream areas. In seeded areas, straw wattles also enable seeds to settle and germinate, aiding the revegetation process. By filtering overland runoff and holding sediment on the slope, Straw Wattles also help to protect lakes, ponds, rivers and streams from sediment pollution. By filtering overland runoff and holding sediment on the slope, straw bales can also help to protect water quality. Silt fence are installed along the downstream perimeter of a construction site to prevent sediment transport off construction areas. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. All erosion control blankets and straw mulches will be covered under 484-Mulching. If earthen basins are warranted for water quality improvement or retention/detention purposes, use Sediment Basin (350) or Dam (402) as appropriate. If seeding is warranted for water quality and erosion control purposes, all temporary and permenant vegetation will use Critical Area Planting (342).

**Feature Measure:** Area of construction site

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $950.77

**Scenario Cost/Unit:** $950.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.5 | $35.51 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| 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. | Hours | $41.94 | 1.5 | $62.91 |
| **Materials** | | | | | | |
| Silt Fence | 43 | Silt Fence with support post. Includes materials, equipment and labor | Feet | $1.58 | 100 | $158.00 |
| Wattles, straw, 8-9 in. x 25 ft. | 1405 | Tubes of rice straw, approximately 8-9 inch in diameter, 25 feet long . Includes materials and shipping only (including stakes). | Feet | $1.09 | 100 | $109.00 |
| Straw bales | 2186 | Straw bales buried at defined intervals to halt rill and gulley formation. Materials and shipping only. | Each | $8.63 | 25 | $215.75 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 125 | $125.00 |

**Practice:** 574 - Spring Development

**Scenario:** #1 - Collection Structure

**Scenario Description:**

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a water collection structure. Payment includes excavation and labor to expose the spring, concrete for collection box, lid and gravel backfill. Resource Concern: Livestock production limitation - Inadequate livestock water.

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Site is excavated with a backhoe to expose the seep, a concrete collection box (3'x3'x4') is installed and gravel is backfilled between the spring source and collection box. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,251.80

**Scenario Cost/Unit:** $1,251.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 0.75 | $365.82 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 4 | $125.16 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 1 | $30.70 |
| Spring Collection Box Cover, steel, 4 ft. diameter | 1281 | 4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $183.28 | 1 | $183.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 574 - Spring Development

**Scenario:** #2 - Horizontal Collection Pipe

**Scenario Description:**

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system. The collection system is commonly composed of perforated drainage pipe placed in an excavated collection trench that runs across the slope, and is piped directly to watering facilities (implemented through associated practice 614). Resource Concern: Livestock production limitation - Inadequate livestock water.

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long). Associated Practices: 516-Livestock Pipeline; 614-Watering Facility

**Feature Measure:** Number of Development

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $888.42

**Scenario Cost/Unit:** $888.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 11 | $14.30 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 4 | $125.16 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 3 | $88.02 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 3 | $92.10 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.44 | 50 | $22.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 574 - Spring Development

**Scenario:** #3 - Horizontal Pipe with Collection Box

**Scenario Description:**

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system and a water storage structure. The collection system is commonly composed of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope into the collection box. Resource Concern: Livestock production limitation - Inadequate livestock water.

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a spring box (48 inch diameter x 6 ft long CMP). Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long). Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,341.86

**Scenario Cost/Unit:** $2,341.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 1 | $487.76 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 11 | $14.30 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 8 | $250.32 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 3 | $88.02 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 3 | $92.10 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $3.73 | 20 | $74.60 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.44 | 50 | $22.00 |
| Pipe, CMP, 48 in., 14 Gauge | 1280 | 48 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only. | Feet | $47.68 | 6 | $286.08 |
| Spring Collection Box Cover, steel, 4 ft. diameter | 1281 | 4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $183.28 | 1 | $183.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 574 - Spring Development

**Scenario:** #4 - Vertical Collection and Storage Pipe

**Scenario Description:**

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. Typically installed at the point source of a spring and provides for collection and storage of water. Payment includes the vertical excavation of the spring source, placement of vertical collection pipe and gravel around the pipe. Resource Concern: Livestock production limitation - Inadequate livestock water.

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a vertical 48 inch diameter x 12 ft tall CMP. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,941.26

**Scenario Cost/Unit:** $1,941.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 8 | $250.32 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 3 | $92.10 |
| Pipe, CMP, 48 in., 14 Gauge | 1280 | 48 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only. | Feet | $47.68 | 12 | $572.16 |
| Spring Collection Box Cover, steel, 4 ft. diameter | 1281 | 4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $183.28 | 1 | $183.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 575 - Trails and Walkways

**Scenario:** #4 - Trail or Walkway, Rock/Gravel on Geotextile

**Scenario Description:**

Layout and construct a trail or walkway with rock and or gravel on a geotextile fabric foundation to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide trails for recreational activities or access to recreation sites and address the resource concerns of soil erosion and water quality degradation. Includes excavation, shaping, grading, rock and or gravel, geotextile, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion, water quality, and livestock production limitation resource concerns. This practice also applies to trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are designed for off-road use.

**After Situation:**

The typical trail or walkway is an 8 foot wide by 600 foot long lane with a surface treatment of rock and or gravel on a geotextile fabric foundation. The trail or walkway is constructed of approved materials, with a life expectancy that meets or exceeds the planned useful life of the installation. All materials, equipment, and labor to install the trail or walkway and surfacing is included. Vegetation of adjacent disturbed areas is also included. The resource concerns of soil erosion, water quality, and livestock production limitations have been addressed. Other associated practices include Stream Crossing (578), Diversion (362), and Fence (382). Use Access Road (560) if the movement of vehicles or equipment is needed for purposes other than management and maintenance of the trail or walkway.

**Feature Measure:** Length of trail or walkway

**Scenario Unit:** Feet

**Scenario Typical Size:** 600.0

**Scenario Total Cost:** $4,428.77

**Scenario Cost/Unit:** $7.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 534 | $694.20 |
| 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 Yards | $2.12 | 30 | $63.60 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| **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. | Hours | $31.49 | 4 | $125.96 |
| 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. | Hours | $24.46 | 6 | $146.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 90 | $2,763.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.04 | $1.23 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 578 - Stream Crossing

**Scenario:** #1 - Gravel Crossing

**Scenario Description:**

A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles. This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford crossing is desired for livestock, people, and /or equipment. Stream bed in the channel reach containing the crossing must be vertically stable. Scenario is for stabilizing the bottom and slope of a stream channel using gravel and geotextile. This scenario includes site preparation, dewatering, acquiring and installing gravel on channel bottom and approaches. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic.

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Scenario is based upon a vehicle crossing 8' wide stream with 5' high banks and a 12' wide crossing with 6:1 approach. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices: (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

**Feature Measure:** Crossing dimensions

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 816.0

**Scenario Total Cost:** $1,005.62

**Scenario Cost/Unit:** $1.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $1.40 | 30 | $42.00 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 15 | $460.50 |
| Geotextile, non-woven, heavy weight | 1210 | Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.55 | 100 | $155.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 578 - Stream Crossing

**Scenario:** #2 - Rip Rap Crossing

**Scenario Description:**

A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles. This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford crossing is desired for livestock, people, and /or equipment. Stream bed in the channel reach containing the crossing must be vertically stable. Scenario is for stabilizing the bottom and slope of a stream channel using Rip Rap, gravel and geotextile. This scenario includes site preparation, dewatering, acquiring and installing rip rap and gravel on channel bottom and approaches. Scenario is based on a 20' wide x 50' long crossing. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic.

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices: (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

**Feature Measure:** Crossing dimensions

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $4,506.01

**Scenario Cost/Unit:** $4.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $1.40 | 37 | $51.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 37 | $3,560.51 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 19 | $583.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 578 - Stream Crossing

**Scenario:** #4 - Concrete Crossing

**Scenario Description:**

A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles. This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford crossing is desired for livestock, people, and /or equipment. Stream bed in the channel reach containing the crossing must be vertically stable. Scenario is for stabilizing the bottom and slope of a stream channel using concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel and concrete channel bottom and approaches. Scenario is based on a 20' wide x 50' long crossing. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic.

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices: (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

**Feature Measure:** Crossing dimensions

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $9,339.70

**Scenario Cost/Unit:** $9.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 19 | $6,979.84 |
| 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 Yards | $487.76 | 3 | $1,463.28 |
| 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 Yards | $1.40 | 45 | $63.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 19 | $583.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 578 - Stream Crossing

**Scenario:** #6 - Culvert Installation

**Scenario Description:**

Install a new culvert. Work includes dewatering, site preparation and removing any old crossing, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 30 inch Culvert installation with <75 cy of fill needed and < 2 yds rock riprap for headwalls. Pipe is 40 feet long.Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Access road and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices: (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

**Feature Measure:** Culvert

**Scenario Unit:** Diameter Inch Foot

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $4,766.67

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 3 | $16.53 |
| 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. | Hours | $107.06 | 10 | $1,070.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 10 | $300.60 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 2 | $192.46 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 50 | $1,535.00 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 30 in. | 1247 | Pipe, Corrugated HDPE Double Wall, 30 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $35.03 | 40 | $1,401.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #1 - Bank Shaping

**Scenario Description:**

Protection of streambanks consisting of shaping banks to a stable slope and conventional plantings of vegetation to stabilize and protect against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. Critical Area Planting (342) is included for establishment of vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Linear Feet of Streambank/Shorelin

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $9,417.36

**Scenario Cost/Unit:** $9.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 2500 | $5,300.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 16 | $864.64 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 16 | $403.52 |
| 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. | Hours | $41.94 | 56 | $2,348.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #2 - Bioengineered

**Scenario Description:**

Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank and willow tree planting. A 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. Critical Area Planting (342) is included for establishment of vegetation if needed. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Linear Feet of Streambank/Shorelin

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $22,025.62

**Scenario Cost/Unit:** $22.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 2500 | $5,300.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 16 | $864.64 |
| **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. | Hours | $24.46 | 320 | $7,827.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 16 | $403.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 75 | $2,254.50 |
| 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. | Hours | $41.94 | 80 | $3,355.20 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 1000 | $1,520.00 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #3 - Structural

**Scenario Description:**

Protection of streambanks using rock riprap to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 10-foot high bank at 2(H):1(V) slope for 500 linear feet is used for estimation purposes. The rock will be 2' thick and 10' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Cubic Yard of Riprap

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 833.0

**Scenario Total Cost:** $52,263.85

**Scenario Cost/Unit:** $62.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 1222 | $1,588.60 |
| 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. | Hours | $128.05 | 32 | $4,097.60 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 32 | $807.04 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 1250 | $45,125.00 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #4 - Stream Barb/LPSTP-Longitudinal Peaked Stone Toe Protection-small Streams

**Scenario Description:**

Protection of streambanks using longitudinal peaked stone toe protection to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; J-Hooks and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap and placement. A 4' high stone toe with 1.5:1 sideslopes, 275 linear feet in length is used for estimation purposes. The bank behind the riprap will not be modified. Stream with less than 100 sq miles drainage area. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Linear foot of bank protected

**Scenario Unit:** Feet

**Scenario Typical Size:** 275.0

**Scenario Total Cost:** $15,259.59

**Scenario Cost/Unit:** $55.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 8 | $856.48 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.19 | 24 | $100.56 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 367 | $13,248.70 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #5 - Stone Toe protection with vegetation

**Scenario Description:**

Protection of streambanks using riprap toe protection with grass vegetation on the upper portion of the bank to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap and bank shaping. Typical installation consists of 4 vertical feet of riprap toe protection on a 2:1 slope, 2' thick. 4 vertical feet of bank above the rock will be shaped to a 4:1 slope, seeded to cool season vegetation and covered with coir erosion control blanket. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Linear Feet of Bank Protected

**Scenario Unit:** Feet

**Scenario Typical Size:** 250.0

**Scenario Total Cost:** $14,306.55

**Scenario Cost/Unit:** $57.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 8 | $856.48 |
| 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. | Acres | $11.75 | 0.2 | $2.35 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.19 | 560 | $2,346.40 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 250 | $9,025.00 |
| Stakes, wood, 1 in. x 2 in. x 24 in. | 1579 | 1 in. x 2 in. x 24 in. wood stakes to fasten items in place. Includes materials only. | Each | $0.66 | 306 | $201.96 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 0.2 | $9.59 |
| Coir Erosion Control Fabric | 2765 | Open weave spun coir erosion control fabric. Includes materials and shipping only. | Square Yard | $2.44 | 361 | $880.84 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #6 - Stream Barb/Bendway Weir-large stream

**Scenario Description:**

Protection of streambanks using stream barbs to stabilize and protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of 7 streambarbs, each 7' tall and 60' long protecting 650' of bank. Stream with 100 sq miles or more drainage area. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Lineal Feet of bank protected

**Scenario Unit:** Feet

**Scenario Typical Size:** 650.0

**Scenario Total Cost:** $59,439.23

**Scenario Cost/Unit:** $91.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 40 | $4,282.40 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.19 | 42 | $175.98 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 40 | $1,202.40 |
| 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. | Hours | $41.94 | 40 | $1,677.60 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 1430 | $51,623.00 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #7 - Weir/Riffle Small

**Scenario Description:**

Protection of streambanks using a rock riffle to stabilize and protect banks of streams or excavated channels against scour and erosion by controlling down cutting. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of a 1' high riffle on a stream with a 8' bottom width and 5' banks. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Per structure installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,674.37

**Scenario Cost/Unit:** $3,674.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 6 | $642.36 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.19 | 24 | $100.56 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 6 | $180.36 |
| 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. | Hours | $41.94 | 6 | $251.64 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 56 | $2,021.60 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #8 - Weir/Riffle Medium

**Scenario Description:**

Protection of streambanks using a rock riffle to stabilize and protect banks of streams or excavated channels against scour and erosion by controlling down cutting. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of a 1.5' high riffle on a stream with a 20' bottom width and 6' banks. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Per structure installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,544.31

**Scenario Cost/Unit:** $7,544.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 12 | $1,284.72 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.19 | 62 | $259.78 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| 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. | Hours | $41.94 | 6 | $251.64 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 136 | $4,909.60 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #9 - Weir/Riffle Large

**Scenario Description:**

Protection of streambanks using a rock riffle to stabilize and protect banks of streams or excavated channels against scour and erosion by controlling down cutting. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of a 1.5' high riffle on a stream with a 30' bottom width and 7' banks. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Per structure installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,953.87

**Scenario Cost/Unit:** $9,953.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 16 | $1,712.96 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.19 | 84 | $351.96 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 16 | $480.96 |
| 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. | Hours | $41.94 | 6 | $251.64 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.10 | 185 | $6,678.50 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #23 - Bankfull Bench, Wood Toe

**Scenario Description:**

Protection of streambanks using toewood (large wood members with root wads) as a structural measure in conjunction with bioengineering techniques involving vegetative measures to stabilize and protect the streambank against scour and erosion. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Typical stream has a 50' bankfull width and 6' banks. Payment cost include protection by use of large wood members with root wads, willow cuttings and revetments, bankfull bench construction, bank shaping and riparian-corridor revegetation. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Linear Feet of Streambank Protecte

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $13,344.87

**Scenario Cost/Unit:** $133.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 222 | $288.60 |
| 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. | Hours | $128.05 | 30 | $3,841.50 |
| **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. | Hours | $24.46 | 30 | $733.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 30 | $901.80 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 222 | $337.44 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 40 | $2,661.20 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $163.19 | 25 | $4,079.75 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.02 | 25 | $250.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #24 - Bankfull Bench, Rock Toe

**Scenario Description:**

Protection of streambanks using rock as a structural measure to stabilize and protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include bankfull bench construction, bank shaping, geotextile, willow trees and rock boulder toe protection. Typical installation consists of a 300’ long bankfull bench, 5’ in height with a 10’ width. 200 2’x2’x3’ rock boulders (89 CY) stacked two high will armor the toe of the bench. The top of the bench consists of a soil lift wrapped in geotextile or coir material. The bank above the bankfull bench will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Cubic Yards of Rock Boulders

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 89.0

**Scenario Total Cost:** $26,521.70

**Scenario Cost/Unit:** $298.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 666 | $865.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 555 | $2,369.85 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 16 | $864.64 |
| 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. | Hours | $128.05 | 40 | $5,122.00 |
| **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. | Hours | $24.46 | 30 | $733.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 16 | $403.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 40 | $1,202.40 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 333 | $506.16 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 200 | $13,306.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #25 - In-Channel Boulder Structure

**Scenario Description:**

Protection of streambanks using bank stabilization measures to stabilize eroding stream banks, reduce near bank stress and prevent sediment from entering streams by constructing in-stream structures such as J-Hooks, Stream barbs, Cross Vanes or Vortex Weirs. The purpose of this practice is to maintain, improve, and restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Typical scenario: Install two J hooks on a 300 ' section of 30 square mile watershed channel, with a bankfull width of 42' and a bankfull depth of 4'. Each J hook has an arm length of 45' with a 14' hook and 14' sill. Boulders are an average dimension of 3'x 3'x 3' and weigh 2 tons. 47 boulders are required for one structure (47 CY). Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility, 570 Stormwater Runoff Control.

**Before Situation:**

A streambank is unstable, vertical and eroding in a meander and laterally moving yearly moving into a landowners field at an accelerated rate. The stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Cubic Yards of Boulders Installed

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 94.0

**Scenario Total Cost:** $19,836.85

**Scenario Cost/Unit:** $211.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 8 | $250.32 |
| 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. | Hours | $128.05 | 24 | $3,073.20 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 32 | $961.92 |
| 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. | Hours | $41.94 | 24 | $1,006.56 |
| **Materials** | | | | | | |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 204 | $13,572.12 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 582 - Open Channel

**Scenario:** #1 - Two stage ditch

**Scenario Description:**

This scenario is the improvement of a channel in which water flows with a free surface. The practice is used for the restoration of a natural or artificial channel to improve nutrient (phosphorus and nitrate) reduction and ecological function by creating a floodplain bench. Installation conditions are normal which means the location is easily accessible from a main road, soils are without large rock or difficult clay to excavate, and/or other aspects are average compared to excavation work in the area.

**Before Situation:**

A stream or channel with active streambank erosion and excess nutrient load from upstream or tile entry sources. This scenario assists in addressing the resource concerns: water quality, streambank erosion, sediment deposition.

**After Situation:**

An earthen floobplain bench is excavated above low channel flow to create floodplain flow area and to stabilize the bottom and side slopes. Nutrients are reduced in the water through bench saturation. Erosion is no longer a resource concern. Typical construction dimensions are similar to Fig. 10-9 in Stream Restoration Design handbook with 10 ft wide benchs excavated on either side of 6 ft deep ditch. Total excavation = 5' x 10' X 2 sides = 100 cubic feet per foot. Cool season grasses are established on the bench and slope areas using 342 Critical Area Planting. Need for mulching (straw or erosion control blanket) would be accomplished through 484-Mulching as necessary. Associated practices: 356-Dike, 393-Filter Strip, 484-Mulching 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

**Feature Measure:** length of channel

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $10,362.96

**Scenario Cost/Unit:** $10.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 3700 | $7,844.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 24 | $1,296.96 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 585 - Stripcropping

**Scenario:** #3 - Stripcropping - wind and water erosion

**Scenario Description:**

This scenario describes the implementation of a strip cropping system that is designed specifically for the control of wind and water erosion or minimizing the transport of sediments or other water borne contaminants originating from runoff on cropland. The planned strip cropping system will meet the current 585 standard. Implementation will result in alternating strips of erosion susceptible crops with erosion resistant crops that are oriented as close to perpendicular to water flows as possible. The designed system will reduce erosion/sediment/contaminants to desired objectives. Payment for implementation is to defray the costs of designing the system, installing the strips on the landscape appropriately, and integrating a crop rotation that includes water erosion resistant species.

**Before Situation:**

In this geographic area, excessive water erosion is caused by raising crops in a manner that allows sheet water flows to travel down the slope causing sheet and rill erosion or concentrated flow conditions, degradation of soil health through loss of topsoil and organic matter, along with offsite negative impacts to water quality and aquatic wildlife habitat.

**After Situation:**

A strip cropping system that includes at least two or more strips within the planning slope will be designed to include parallel strips of approximately equal widths of water erosion resistant crop species with non-water erosion resistant crop species. Widths will be determined using current water erosion prediction technology to meet objectives. The design and implementation of a stripcropping system will minimize wind, sheet and rill erosion, protect soil quality, reduce offsite sedimentation, and benefit offsite aquatic wildlife habitat. Erosion prediction before and after practice application will be recorded showing the design and benefits of the practice. Erosion resistant strips in rotation must be managed to maintain the planned vegetative cover and surface roughness.

**Feature Measure:** area of strips

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $144.39

**Scenario Cost/Unit:** $1.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 3 | $71.01 |
| **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. | Hours | $24.46 | 3 | $73.38 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #1 - Inline Stoplog WCS, Surface Water Control, 6-10 in. dia. Pipe

**Scenario Description:**

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 12", height of six feet, The pipe is 65' of 8" SCH 40 PVC (inlet and outlet combined).

**Before Situation:**

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

**After Situation:**

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,701.61

**Scenario Cost/Unit:** $2,701.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 55 | $303.05 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 2 | $121.72 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $9.90 | 65 | $643.50 |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 36 | $128.88 |
| 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 | $2.35 | 40 | $94.00 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 48 | $593.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #2 - Inline Stoplog WCS, Surface Water Control, 12-18 in. dia. Pipe

**Scenario Description:**

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 65' of 15" SDR35 PVC (inlet and outlet combined).

**Before Situation:**

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

**After Situation:**

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Number of Structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,453.32

**Scenario Cost/Unit:** $4,453.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 55 | $303.05 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 2 | $121.72 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 36 | $128.88 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $10.73 | 4 | $42.92 |
| 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 | $2.35 | 80 | $188.00 |
| Pipe, PVC, 15 in., SDR 35 | 1722 | Materials: 15 inch - PVC - SDR35 - ASTM D3034 | Feet | $26.75 | 65 | $1,738.75 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 90 | $1,113.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #3 - Inline Stoplog WCS, Surface Water Control, >18 in. dia. Pipe

**Scenario Description:**

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 31", height of six feet, The pipe is 65' of 24" used steel (inlet and outlet combined).

**Before Situation:**

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

**After Situation:**

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,226.16

**Scenario Cost/Unit:** $7,226.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 55 | $303.05 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 2 | $121.72 |
| **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. | Hours | $31.49 | 10 | $314.90 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 49 | $175.42 |
| Pipe, Steel, 24 in., Std Wt, USED | 1360 | Materials: - USED - 24 inch - Steel Std Wt | Feet | $50.20 | 65 | $3,263.00 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $10.73 | 8 | $85.84 |
| 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 | $2.35 | 155 | $364.25 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 144 | $1,781.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #4 - Weir Box Inlet WCS, Surface Water Control, <=16 in. dia. Pipe.

**Scenario Description:**

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure with a pipe of 16" diameter or less is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, flap gate and weir box structure.

**Before Situation:**

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

**After Situation:**

A weir box structure is placed in a levee to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,401.70

**Scenario Cost/Unit:** $4,401.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 55 | $303.05 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 2 | $121.72 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 49 | $175.42 |
| Steel, Plate, 3/16 in. | 1048 | Flat Steel Plate, 3/16 inch thick, materials only. | Square Feet | $5.37 | 32 | $171.84 |
| Pipe, Steel, 16 in., Std Wt, USED | 1357 | Materials: - USED - 16 inch - Steel Std Wt | Feet | $38.93 | 65 | $2,530.45 |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $3.52 | 30 | $105.60 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $10.73 | 4 | $42.92 |
| 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 | $2.35 | 82 | $192.70 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #5 - Weir Box Inlet WCS, Surface Water Control, >16 in. dia. Pipe.

**Scenario Description:**

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure with a pipe of greater than 16" diameter is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, flap gate and weir box structure.

**Before Situation:**

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

**After Situation:**

A weir box structure is placed in a levee to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,333.67

**Scenario Cost/Unit:** $5,333.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 55 | $303.05 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 2 | $121.72 |
| **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. | Hours | $31.49 | 9 | $283.41 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $3.58 | 36 | $128.88 |
| Steel, Plate, 3/16 in. | 1048 | Flat Steel Plate, 3/16 inch thick, materials only. | Square Feet | $5.37 | 32 | $171.84 |
| Pipe, Steel, 24 in., Std Wt, USED | 1360 | Materials: - USED - 24 inch - Steel Std Wt | Feet | $50.20 | 65 | $3,263.00 |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $3.52 | 30 | $105.60 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $10.73 | 8 | $85.84 |
| 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 | $2.35 | 155 | $364.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #9 - Inline WCS, Subsurface Drainage Control, <=10 in. dia. Pipe

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres. A single structure with stoplogs may have its influence extended by use of buried float-activated control structures, which may be paid for as separate structures also.

**Feature Measure:** Number of Structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,661.32

**Scenario Cost/Unit:** $1,661.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 3 | $93.87 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 3 | $125.82 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $8.00 | 40 | $320.00 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 48 | $593.76 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #10 - Inline WCS, Subsurface Drainage Control, >10 in. dia. Pipe

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres. A single structure with stoplogs may have its influence extended by use of buried float-activated control structures, which may be paid for as separate structures also.

**Feature Measure:** Number of Structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,375.40

**Scenario Cost/Unit:** $2,375.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 3 | $93.87 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 3 | $125.82 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 380 | $737.20 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 72 | $890.64 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #11 - Inline WCS, Subsurface Drainage Control, float activated head pressure valve

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through an inline water level control structure which is used in conjunction with 3 float activated head pressure valves. Each float activated head pressure valve increases the zone of influence by 1'. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. Multiple buried float-activated structures can be used to extend the influence of a single inline water control structure. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres.

**Feature Measure:** Number of Structures

**Scenario Unit:** Each

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $3,020.16

**Scenario Cost/Unit:** $1,006.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 9 | $281.61 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| 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. | Hours | $41.94 | 9 | $377.46 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $4.45 | 120 | $534.00 |
| Water Level Control Valve, Inline | 2189 | Automatic float valve for drainage pipes up to 8 in. dia. To maintain head differential in flowing agricultural drains. | Each | $504.00 | 3 | $1,512.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #12 - Straight Pipe, Surface Water Control, <=10 in. dia. Pipe (w/o adjustable control)

**Scenario Description:**

Used as an outlet for Wetland; no drop box; straight through 10" diameter PVC pipe; pipe is backfilled with #57 stone to 1' over the top of the pipe; 12" thick layer of Type D riprap is placed at the outlet end with 6" thick of #57 stone under it.

**Before Situation:**

The landowner wishes to establish a wetland area to provide habitat for fish and wildlife.

**After Situation:**

A straight pipe (principal spillway) is installed through an earth embankment to create a wetland. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Feet of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $1,251.11

**Scenario Cost/Unit:** $41.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 5 | $156.45 |
| **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. | Hours | $24.46 | 5 | $122.30 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 5 | $150.30 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 5 | $153.50 |
| Pipe, PVC, 10 in., SDR 35 | 1251 | Pipe, PVC, SDR 35, 10 inch Diameter - ASTM D3034. Material cost only. | Feet | $12.52 | 30 | $375.60 |
| Rock Riprap, graded, angular, material only | 2131 | Graded Rock Riprap for 12" to 24" size ranges. Includes material costs only. Shipping not inlcuded. | Ton | $21.34 | 2 | $42.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #13 - Straight Pipe, Surface Water Control, >=12 in. dia. Pipe (w/o adjustable control)

**Scenario Description:**

Used as an outlet for Wetland; no drop box; straight through 12" diameter PVC pipe; pipe is backfilled with #57 stone to 1' over the top of the pipe; 12" thick layer of Type D riprap is placed at the outlet end with 6" thick of #57 stone under it.

**Before Situation:**

The landowner wishes to establish a wetland area to provide habitat for fish and wildlife.

**After Situation:**

A straight pipe (principal spillway) is installed through an earth embankment to create a wetland. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Feet of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $1,592.97

**Scenario Cost/Unit:** $53.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 5 | $156.45 |
| **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. | Hours | $24.46 | 5 | $122.30 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 5 | $150.30 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 6 | $184.20 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 354 | $686.76 |
| Rock Riprap, graded, angular, material only | 2131 | Graded Rock Riprap for 12" to 24" size ranges. Includes material costs only. Shipping not inlcuded. | Ton | $21.34 | 2 | $42.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 587 - Structure for Water Control

**Scenario:** #310 - Automated DWM Control Structure

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

**Feature Measure:** Number of Structures

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,538.35

**Scenario Cost/Unit:** $4,538.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 2 | $62.58 |
| **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. | Hours | $31.49 | 3 | $94.47 |
| 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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 21 | 988 | Materials: - 8 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $12.80 | 40 | $512.00 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $307.65 | 1 | $307.65 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,577.29 | 1 | $1,577.29 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 60 | $742.20 |
| Valve, Inline, < 12 inch dia. | 2367 | Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only. | Each | $364.98 | 1 | $364.98 |
| Light Duty Linear Actuator | 2724 | 12VDC aluminum light duty linear actuator with 12” stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating. | Each | $133.04 | 1 | $133.04 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 590 - Nutrient Management

**Scenario:** #1 - Basic NM (Non-Organic/Organic)

**Scenario Description:**

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where there is no manure application. Scenario is applicable on non-organic and organic land. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required.

**Before Situation:**

In this geographic area, a fertility program is either nonexistent or does not meet the Nutrient Management (590) CPS. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS, when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields. Nutrient applications will be completed according to the Nutrient Management Plan that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $338.25

**Scenario Cost/Unit:** $8.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 2 | $23.52 |

**Practice:** 590 - Nutrient Management

**Scenario:** #2 - Basic NM with Manure Injection or Incorporation

**Scenario Description:**

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where all applied nutrient sources (nitrogen, phosphorus, and potassium) are either incorporated using tillage at least 3-4 inches deep or injected into the soil at least 3-6 inches deep (Exceptions for incorporation or injection include: established close grown crops such as wheat or perennial crops such as hay or pasture). This scenario is applicable on non-organic and organic land for all nutrient sources (manure, compost, commercial fertilizers, and organic sources of nutrients). Micro-nutrients may be surface applied. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement (incorporation or injection), and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure analysis, incorporation or injection of all nutrients, and the implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to address the Nutrient Management (590) purposes for nitrogen losses via N2O emissions, nitrogen leaching, and nitrogen and phosphorus surface runoff. The basis for nutrient applications will be recommendations based on soil tests; and when applicable, plant tissue, manure, and compost analyses. Soil loss is controlled to the soil loss tolerance criteria or less for the significant soil map unit.

**Before Situation:**

In this geographic area, a fertility program is not properly managed to supply the proper rate, timing, method of application, and source to address air and water quality. Application of fertilizers, including manures, composts, and amendments, are surface applied and completed annually based upon tradition that does not specifically consider the detrimental effects of improper timing or rates of all nutrient sources, or excess nutrient buildup in the soil, emissions of N2O, surface runoff, or the leaching of nitrogen to ground or surface water via subsurface drainage. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Soil testing is not completed on a regular basis and applications of all nutrient sources are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade air and water quality. Soil quality may be degraded by excess or inadequate nutrients and erosion. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion in excess of the planning criteria.

**After Situation:**

A nutrient management system is developed with the producer to meet the current Nutrient Management (590) CPS; and when applicable, the system will also meet NOP regulations. All nutrient sources will be incorporated with tillage at least 3-4 inches deep or injected at least 4-6 inches deep into the soil (Exceptions for incorporation or injection include: established close grown crops such as wheat or perennial crops such as hay or pasture). Implementation of the nutrient management plan (NMP) will benefit plant productivity while also reducing the potential for off-site degradation. A nutrient management budget will be developed for each field based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing (and where applicable manure analyses, plant tissue analyses, etc.) is completed according to LGU recommendations. Applications of all phosphorus and nitrogen sources are based on risk assessments (PI - phosphorus index and leaching index). Records will be provided annually documenting current soil tests and other plant or manure analyses, date and rate of applications, form and placement of nutrients for each field, including post-harvest yields. Nutrient applications will be completed according to the NMP that minimizes nutrient runoff, nitrogen leaching, nitrogen emissions, or buildup of excess nutrient concentrations in the soil.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $1,349.63

**Scenario Cost/Unit:** $33.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 40 | $634.80 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 2 | $23.52 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $40.16 | 1 | $40.16 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $45.36 | 1 | $45.36 |

**Practice:** 590 - Nutrient Management

**Scenario:** #3 - Small Farm NM (Non-Organic/Organic)

**Scenario Description:**

Scenario is applicable on non-organic and organic land. Scenario implementation of a basic nutrient management system on small, often diversified farm systems typically between 0.5-10 acres where manure and/or compost may be utilized either alone or in conjunction with commercial fertilizer. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to encourage producers to effectively utilize commercial fertilizers, organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil, manure, and compost analyses.

**Before Situation:**

In this geographic area, a fertility program is either nonexistent or does not meet the Nutrient Management (590). Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590), when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field, crop block, or crop rotation within a block/field based on soil test analysis and land grant university recommendations or crop removal rates. Application of nutrients will be completed at the proper rate, timing, and methods, and sources per the NMP. Records will be provided annually of current soil test, analysis, application timing, nutrient source, application method, application rate, and crop yields for each block. Nutrient applications will be completed according to the NMP that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

**Feature Measure:** <Unknown>

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $279.03

**Scenario Cost/Unit:** $279.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 3 | $73.38 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 2 | $23.52 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $40.16 | 1 | $40.16 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $45.36 | 1 | $45.36 |

**Practice:** 590 - Nutrient Management

**Scenario:** #4 - Basic NM with Manure and/or Compost (Non-Organic/Organic)

**Scenario Description:**

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where manure and/or compost is utilized either alone or in conjunction with commercial fertilizer. Scenario is applicable on non-organic and organic land. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to encourage producers to effectively utilize commercial fertilizers, organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil, manure, and compost analyses.

**Before Situation:**

In this geographic area, a fertility program is either nonexistent or at a basic level. Application of fertilizers, including manures, composts, and amendments, are completed annually based upon tradition that does not specifically consider the detrimental effects of improper timing or rates of nutrients, or excess nutrient buildup in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS, when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. Records will be provided annually of the current soil test, analysis, application rate, forms and rates of nutrients for each field, including crop yields. Nutrient applications will be completed according to the Nutrient Management Plan that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $714.83

**Scenario Cost/Unit:** $17.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 2 | $23.52 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $40.16 | 1 | $40.16 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $45.36 | 1 | $45.36 |

**Practice:** 590 - Nutrient Management

**Scenario:** #5 - Basic Precision NM (Non-Organic/Organic)

**Scenario Description:**

This scenario takes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced and improves it to address air quality (reduce emissions for N fertilizer) and/or minimize agricultural nonpoint source pollution of surface and groundwater. The planned NM system will meet the current Nutrient Management (590) CPS general and additional criteria. Precision nutrient management system includes such items as split applications, variable rate applications, nitrification or urease inhibitors, additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Payment for implementation is to defray the costs of grid or zone soil testing, additional testing and analysis, equipment, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

**Before Situation:**

In this geographic area, conventional fertility programs involve very little or no soil or manure testing. Application of fertilizers, including manures and amendments, are completed annually based upon tradition that does not specifically consider the detrimental affects of improper timing or rates of nutrients, nitrous oxide emissions or excess nutrient build-up in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Runoff flows into adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters or leaching of nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil quality may also be detrimentally affected.

**After Situation:**

A precision nutrient management system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria, when applicable the system will also meet NOP regulations. Development and implementation of a Nutrient Management Plan (NMP) based on the 4Rs will benefit plant productivity while reducing potential of off-site movement of nutrients, including reducing nitrogen emissions. NMP may include practices such as use of split applications, slow release nutrients, nitrification inhibitors, urease inhibitors, proper timing of application, more appropriate formulations, banding, etc. Additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, spectral analysis, etc., may also be used to further refine nutrient applications. Use of a post-harvest soil test or tissue tests will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Potential for offsite movement of nutrient may be further reduced by identifying variability across the field(s) by using soil survey maps or other simple techniques to establish management zones, along with grid or zone soil testing. Nutrients are applied at rates based on soil test zone analyses. Nitrogen and Phosphorus risk assessment tools are completed and results included in the nutrient management system specifications as required by current NRCS 590 CPS criteria and any mitigation measures are included in the conservation plan if determined needed by risk assessment results. Soil testing is completed according to LGU recommendations. Analysis are completed at least once every three years for N-P-K, and for N annually. A nutrient budget is developed for each field or management zone annually. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,019.37

**Scenario Cost/Unit:** $50.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 2 | $41.40 |
| Satellite imagery, aerial photography, infrared | 966 | Infrared imagery | Acres | $0.20 | 40 | $8.00 |
| Chlorophyll Reader | 1125 | Applicator and chlorophyll sensor includes labor. No materials | Acres | $10.24 | 40 | $409.60 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 60 | $705.60 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $22.74 | 1 | $22.74 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 1 | $9.35 |

**Practice:** 590 - Nutrient Management

**Scenario:** #8 - Adaptive NM

**Scenario Description:**

The practice scenario is for the implementation of nutrient management on a small plot, as detailed in outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement various nutrient use efficiency improvement methods for timing, rate, method of application, or source of nutrients.

**Before Situation:**

The practice will be installed on cropland (small grain rotation or typical corn-soybean rotation) to address water quality degradation, air quality degradation and energy concerns. The scenario applies to non-organic and organic operations.

**After Situation:**

Installation of this scenario will result in adopting the four R's of nutrient management following the procedures outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Implementation involves establishing the replicated plots to evaluate one or more of the 4 R's. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant or extension professional knowledgeable in nutrient management and experimental design and data collection. Results are used to make nutrient application decisions to address water quality degradation issues and nutrient use efficiencies. Yields will be measured and statistically analyzed and summarized following the procedures in Agronomy Technical Note 7. The yields for each plot will be adjusted to the appropriate moisture content.

**Feature Measure:** <Unknown>

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,533.63

**Scenario Cost/Unit:** $2,533.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Satellite imagery, aerial photography, infrared | 966 | Infrared imagery | Acres | $0.20 | 1 | $0.20 |
| **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. | Hours | $24.46 | 25 | $611.50 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 15 | $1,449.15 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 2 | $23.52 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $22.74 | 14 | $318.36 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 14 | $130.90 |

**Practice:** 591 - Amendments for Treatment of Agricultural Waste

**Scenario:** #3 - Litter Amendments applied for Air Quality resource concerns

**Scenario Description:**

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. The amendment used is proven to reduce ammonia levels in the house by transforming nitrogen into a form of ammonium. The purpose of the practice is to address resource concerns from existing nutrient levels that may contribute to air quality impacts such as objectionable odors and ammonia emissions and impacts on bird health due to excess nutrients and pathogens. Associated practices: Nutrient Management (590).

**Before Situation:**

Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions.

**After Situation:**

This scenario is based on a typical poultry operation with a 2-house facility and each house size is 40' x 400', 16,000 SF. An NRCS approved amendment is applied between flocks, 5 flocks annually, at rate required to meet air quality resource concern, typically 100 pounds per 1000 SF. Formula to calculate the amount of amendment per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of Applications per Year)= Number of 1000SF. 16,000 SF / 1000 SF X 2 houses X 5 applications/year= 160 units of 1000SF An NRCS approved amendment is applied between each flock, 5 applications, at rate required for treatment to address air quality resource concerns. For most products, this is 100 pounds per 1000 SF. The amendment is proven to control the odor, and to reduce ammonia emissions. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts of objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns.

**Feature Measure:** Number of 1000SF applications per

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $4,764.88

**Scenario Cost/Unit:** $29.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Application of ag waste amendment for poultry litter | 2020 | Litter amendment application performed in house. Includes equipment, power unit and labor costs. | Ton | $55.61 | 8 | $444.88 |
| **Materials** | | | | | | |
| Ag Waste Amendment, sodium bisulfate | 1686 | Sodium bisulfate poultry litter amendment. NRCS approved for air quality concerns to reduce ammonia emissions from the litter. Includes materials only. | Ton | $540.00 | 8 | $4,320.00 |

**Practice:** 591 - Amendments for Treatment of Agricultural Waste

**Scenario:** #4 - Litter Amendments applied on a %w/w basis for Water Quality Impacts

**Scenario Description:**

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce water-soluble phosphorous in the poultry litter by a specified percentage. The amendment used is proven to and transform nitrogen into a form of ammonium and reduce the concentration of water-soluble phosphorous in the litter and reduces ammonia levels in the house. Resource concerns from existing nutrient levels may contribute to water quality degradation from nutrient runoff and leaching from fields fertilized with poultry litter and air quality impacts such as objectionable odors and ammonia emissions. Associated practices: Nutrient Management (590).

**Before Situation:**

Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions and soluble phosphorus.

**After Situation:**

This scenario is based on a typical poultry operation with a desired application rate is 10% by weight of the litter (10%w/w) of a phosphorus binding amendment. Typical operation consists of 2 houses, 40' x 400' house (16,000 SF), 20,000 birds (4 pound finished bird weight), 0.5 lb litter/bird (assume 54 pounds P205/Ton of litter). The operation raises 5 flocks per year. Formula to calculate required amendment at the prescribed rate in tons per year is: (Number of birds) X (Finish weight of birds (lbs)) X (Pounds of litter)/bird) X (Number of houses) X (application rate) X (Number of applications per year) / 2000 pounds/ton 20,000 birds X 4 lb bird X 0.50 lb litter/bird X 2 houses X 0.10 lb amendment/lb litter X 5 app/year / 2000 lb/ton = 20 tons/year. An NRCS approved amendment is applied between each flock at the prescribed rate. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The amendment is proven to reduce soluble phosphorus in the litter, to control the odor, and to reduce ammonia emissions. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses water quality degradation due to nutrients in surface and ground water and air quality impacts from objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns.

**Feature Measure:** Tons of amendment per year.

**Scenario Unit:** Ton

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $9,012.20

**Scenario Cost/Unit:** $450.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Application of ag waste amendment for poultry litter | 2020 | Litter amendment application performed in house. Includes equipment, power unit and labor costs. | Ton | $55.61 | 20 | $1,112.20 |
| **Materials** | | | | | | |
| Ag Waste Amendment, aluminum sulfate, alum | 1684 | Aluminum sulfate, alum, poultry Litter amendment. NRCS approved for air and water quality concerns to reduce ammonia emissions and soluble phosphorus in the litter. Materials only. | Ton | $395.00 | 20 | $7,900.00 |

**Practice:** 592 - Feed Management

**Scenario:** #3 - Livestock

**Scenario Description:**

This example is feed ration management on a swine finishing operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concernss are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degredation concerns. Associated Practices: Nutrient management (590)

**Before Situation:**

The producer is feeding a single diet with a higher level of protein (16%) and phosphorus (0.65%) than is needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.

**After Situation:**

This scenario's operation currently houses 2800 finishing hogs with an average weight of 154 pounds, or 430 animal units ((2800 hogs * 154 lbs/hog/1000 lbs/AU154)) = 430 AU). The farm typically gows out 2.5 turns per year. A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manaure management prevents surface and groundwater degredation from excess nitrogen and phosphorus.

**Feature Measure:** Number of 1000 pound animal unit

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 1,075.0

**Scenario Total Cost:** $2,003.92

**Scenario Cost/Unit:** $1.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 12 | $377.88 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 12 | $1,159.32 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $40.16 | 4 | $160.64 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $27.60 | 4 | $110.40 |

**Practice:** 592 - Feed Management

**Scenario:** #4 - Poultry/Layer Operation

**Scenario Description:**

This example is feed ration management on a poultry or layer operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concernss are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degredation concerns. Associated Practices: Nutrient management (590)

**Before Situation:**

The producer is feeding animals a single diet with a higher nutrient levels than are needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.

**After Situation:**

This scenario's operation currently houses 15,000 broilers with an average weight of 5 pounds, or 75 animal units ((15,000 broilers * 5lbs/chicken/1000 lbs/) = 75 AU). A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manaure management prevents surface and groundwater degredation from excess nitrogen and phosphorus.

**Feature Measure:** Number of 1000 pound animal unit

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 75.0

**Scenario Total Cost:** $1,711.95

**Scenario Cost/Unit:** $22.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 15 | $472.35 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 8 | $772.88 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $40.16 | 4 | $160.64 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $27.60 | 4 | $110.40 |

**Practice:** 592 - Feed Management

**Scenario:** #19 - Animal Group

**Scenario Description:**

Feed ration management on an animal operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for “landlocked” farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient Management (590), Prescribed Grazing (528), Forage Harvest Management (511).

**Before Situation:**

Producer is feeding a higher level of protein and/or phosphorus than is needed to meet National Research Council (NRC) recommendations for a group of animals of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

**After Situation:**

The scenario assumes that a specific group of animals is being evaluated. A baseline analysis of 4 samples each with 4 quarterly reports of manure, and feed will be completed to determine the current inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a group of animals of this type and at this stage of production. The producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and/or phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include such things as grouping animals by similar age, sex, or stage of production, feeding based on individual rolling average production, or feeding “homegrown” or local feedstuffs.

**Feature Measure:** Group

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,603.40

**Scenario Cost/Unit:** $3,603.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 24 | $587.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 20 | $1,932.20 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $40.16 | 16 | $642.56 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $27.60 | 16 | $441.60 |

**Practice:** 592 - Feed Management

**Scenario:** #35 - Feed Additive

**Scenario Description:**

Feed ration management on an animal operation by inclusion of a feed additive. The resource concerns may be water quality degradation (pathogens, soluble nutrients), air quality (odors, green house gas). The goal of the practice is to add an approved feed additive that has been proven to reduce pathogens, or tie up soluble nutrients, or improve air quality by reducing odors, ammonia, or green house gases to the animal diet. For this scenario, zeolite will be added to beef and dairy rations to reduce ammonia emissions. Associated practices: Nutrient Management (590).

**Before Situation:**

Producer is feeding a balanced diet to his animals. He knows that the diet, however is leading to resource concerns by soluble nutrients or pathogens entering the surface water from his operation, or that odors, NOx, or Methane are affecting air quality. For this scenario, the producer knows that nitrogen loss via ammonia volatilization from manure is affecting air quality and that adding zeolite to the ration will decrease this effect and improve air quality for his animals.

**After Situation:**

The scenario assumes that a specific group of animals is being evaluated for a resource concern, and that a proven feed additive can have an effect on that concern. For this particular scenario, a zeolite is added to a beef or dairy ration at a rate of 2% of the daily ration. The zeolite will absorb ammonia and other compounds, resulting in lower nitrogen excretion and thus lower ammonia emissions from the manure and result in improved air quality. Assume that one hour of general labor will be needed per year per animal unit to load/unload zeolite into feed mixing equipment. Assume that the zeolite is added based on a 2% inclusion rate of the dry matter ration of 25 pounds/day/animal unit or the amount of zeolite needed is 0.5 pounds/day/animal unit or about 0.1 tons/year/animal unit.

**Feature Measure:** Per Animal unit, per year

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $62.06

**Scenario Cost/Unit:** $62.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 1 | $24.46 |
| **Materials** | | | | | | |
| Zeolite, Bulk | 2683 | Zeolite applied as a pen surface amendment or used as a feed ingredient. Zeolite is added to feed as a nutrition-based strategies or applied to pen surface as an ammonia abatement measures in livestock production, means of reducing ammonia emissions from concentrated animal feeding operations. | Ton | $376.00 | 0.1 | $37.60 |

**Practice:** 595 - Pest Management Conservation System

**Scenario:** #115 - Plant Health PAMS (acs) Low labor only

**Scenario Description:**
PAMS activities with low labor costs will be implemented on a large scale crop production area.

**Before Situation:**
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**
Planned Prevention (resistant cultivar selection, pest habitat removal, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Acres of management applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $561.13

**Scenario Cost/Unit:** $14.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |

**Practice:** 595 - Pest Management Conservation System

**Scenario:** #126 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

**Feature Measure:** Small Farm, typically <= 5 acs

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,692.51

**Scenario Cost/Unit:** $1,692.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 20 | $629.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 11 | $1,062.71 |

**Practice:** 595 - Pest Management Conservation System

**Scenario:** #130 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

**Feature Measure:** Small Farm, typically <= 5 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,020.52

**Scenario Cost/Unit:** $1,020.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 14 | $440.86 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |

**Practice:** 595 - Pest Management Conservation System

**Scenario:** #132 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,404.55

**Scenario Cost/Unit:** $60.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 15 | $472.35 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 20 | $1,932.20 |

**Practice:** 595 - Pest Management Conservation System

**Scenario:** #134 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $1,379.75

**Scenario Cost/Unit:** $34.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 7 | $220.43 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 12 | $1,159.32 |

**Practice:** 595 - Pest Management Conservation System

**Scenario:** #136 - Plant health PAMS (Small Farm - each) labor only

**Scenario Description:**

PAMS activities with labor costs will be implemented on a small scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (resistant cultivar selection, pest habitat removal, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Small farm, typically <= 5 ac

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $529.64

**Scenario Cost/Unit:** $529.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **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. | Hours | $31.49 | 1 | $31.49 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |

**Practice:** 600 - Terrace

**Scenario:** #1 - Broadbase, with Topsoiling

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. Scenario is for the installation of a system of broadbase terraces where channel and berm are farmed. Topsoil is stripped and stockpiled during construction. A stable outlet is provided in the form of a Grassed Waterway, other open outlet or Underground Outlet through associated practices. Payment include all equipment and labor necessary to excavate, shape, and compact terraces, and stripping and stockpiling topsoil. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of broadbased terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Underground Outlet (620), Critical Area Planting (342) and Grassed Waterway (412).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $10,527.80

**Scenario Cost/Unit:** $4.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 4500 | $4,005.00 |
| 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 Yards | $1.57 | 3750 | $5,887.50 |
| **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. | Hours | $31.49 | 5 | $157.45 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 600 - Terrace

**Scenario:** #2 - Broadbase, no Topsoiling

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. Scenario is for the installation of a system of broadbase terraces where channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway, other open outlet or Underground Outlet through associated practices. Payment includes all equipment and labor necessary to excavate, shape, and compact terraces. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of broadbased terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Underground Outlet (620), Critical Area Planting (342) and Grassed Waterway (412).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $6,522.80

**Scenario Cost/Unit:** $2.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| 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 Yards | $1.57 | 3750 | $5,887.50 |
| **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. | Hours | $31.49 | 5 | $157.45 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 600 - Terrace

**Scenario:** #3 - Broadbase, with Topsoiling, Crop Season Construction

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. Scenario is for the installation of a system of broadbase terraces where channel and berm are farmed. Topsoil is stripped and stockpiled during construction. A stable outlet is provided in the form of a Grassed Waterway, other open outlet or Underground Outlet through associated practices. Payment includes all equipment and labor necessary to excavate, shape and compact terraces, stripping and stockpiling topsoil and foregone income for the loss of crop income due to construction of the practice during the crop season. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of broadbased terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Underground Outlet (620), Critical Area Planting (342) and Grassed Waterway (412).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $14,413.70

**Scenario Cost/Unit:** $5.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 4500 | $4,005.00 |
| 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 Yards | $1.57 | 3750 | $5,887.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 6 | $1,932.54 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 6 | $1,953.36 |
| **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. | Hours | $31.49 | 5 | $157.45 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 600 - Terrace

**Scenario:** #10 - Grassed Terrace, with Topsoiling

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. Scenario is for the installation of a system of terraces where each terrace is constructed as a narrowbase terrace with 2:1 slopes, OR where each terrace is constructed with one relatively flat (5:1) slope and one steep (2:1) slope. Topsoil is stripped from the borrow area and replaced upon completion of the terrace. The steep slopes are established to permanent vegetation and the flatter slopes are farmed. A stable outlet is provided in the form of a Grassed Waterway, other open outlet or Underground Outlet through associated practices. Payment includes all equipment and labor necessary to excavate, shape, and compact terraces, and stripping and stockpiling topsoil. For the establishment of permanent vegetation on the terraces use associated practice Critical Area Planting (342). This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of terraces measuring 2,500 feet in length is installed with the spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Terraces are installed with either 2:1 slopes and a 4.2’ height, OR with one steep (2:1) and one flat (5:1) slope and 3.2' height. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $9,742.80

**Scenario Cost/Unit:** $3.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 4500 | $4,005.00 |
| 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 Yards | $1.57 | 3250 | $5,102.50 |
| **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. | Hours | $31.49 | 5 | $157.45 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 600 - Terrace

**Scenario:** #11 - Grassed Terrace, no Topsoiling

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. Scenario is for the installation of a system of terraces where each terrace is constructed as a narrowbase terrace with 2:1 slopes, OR where each terrace is constructed with one relatively flat (5:1) slope and one steep (2:1) slope. The steep slopes are established to permanent vegetation and the flatter slopes are farmed. A stable outlet is provided in the form of a Grassed Waterway, other open outlet or Underground Outlet through associated practices. Payment includes all equipment and labor necessary to excavate, shape, and compact terraces. For the establishment of permanent vegetation on the terraces use associated practice Critical Area Planting (342). This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of terraces measuring 2,500 feet in length is installed with the spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Terraces are installed with either 2:1 slopes and a 4.2’ height, OR with one steep (2:1) and one flat (5:1) slope and 3.2' height. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $5,737.80

**Scenario Cost/Unit:** $2.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| 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 Yards | $1.57 | 3250 | $5,102.50 |
| **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. | Hours | $31.49 | 5 | $157.45 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 600 - Terrace

**Scenario:** #12 - Grassed Terrace, with Topsoiling, Crop Season Construction

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. Scenario is for the installation of a system of terraces where each terrace is constructed as a narrowbase terrace with 2:1 slopes, OR where each terrace is constructed with one relatively flat (5:1) slope and one steep (2:1) slope. Topsoil is stripped from the borrow area and replaced upon completion of the terrace. The steep slopes are established to permanent vegetation and the flatter slopes are farmed. A stable outlet is provided in the form of a Grassed Waterway, other open outlet or Underground Outlet through associated practices. Payment includes all equipment and labor necessary to excavate, shape and compact terraces, stripping and stockpiling topsoil, and foregone income for the loss of crop income due to construction of the practice during the crop season. For the establishment of permanent vegetation on the terraces use associated practice Critical Area Planting (342). This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of terraces measuring 2,500 feet in length is installed with the spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Terraces are installed with either 2:1 slopes and a 4.2’ height, OR with one steep (2:1) and one flat (5:1) slope and 3.2' height. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $13,628.70

**Scenario Cost/Unit:** $5.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 4500 | $4,005.00 |
| 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 Yards | $1.57 | 3250 | $5,102.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 6 | $1,932.54 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 6 | $1,953.36 |
| **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. | Hours | $31.49 | 5 | $157.45 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 604 - Saturated Buffer

**Scenario:** #2 - Saturated Buffer

**Scenario Description:**

Water discharging from a subsurface drainage system is dispersed along a buffer strip (often a riparian buffer). The water flows underground through the buffer area where nutrients and sediment can be removed before the water reaches the stream. Resource Concerns: Water Quality Degradation (Nutrients) Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

Water from a subsurface drainage system flows directly into a stream, carrying sediment and nutrients.

**After Situation:**

Water from a subsurface drainage system is dispersed through at 400 feet of 5" HDPE single wall perforated pipe tile drain along an established vegetated buffer strip at least 30 feet from the receiving stream. Drainage pipe is trenched in at 4 feet depth. The water is detained by passing underground where the nitrogen is removed by bacteria and natural processes.

**Feature Measure:** Length of Dispersal conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 400.0

**Scenario Total Cost:** $3,277.64

**Scenario Cost/Unit:** $8.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 400 | $508.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 3 | $93.87 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 1 | $25.22 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $8.00 | 40 | $320.00 |
| Pipe, HDPE, 5 in., PCPT, Single Wall | 1271 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only. | Feet | $0.71 | 400 | $284.00 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 60 | $742.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario:** #5 - Denitrifying Bioreactor with liner, no soil cover

**Scenario Description:**

Scenario describes a structure containing a carbon source installed to intercept subsurface drain (tile) flow or ground water, and reduce the concentration of nitrate-nitrogen in subsurface agricultural drainage flow via enhanced nitrification. Woodchips serve as the carbon source necessary to the denitrification process. This bioreactor has a geotextile fabric (or polyethylene - PE) LINER between the wood chips and the surrounding soil plus the following components: woodchip filled pit, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

**Before Situation:**

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

**After Situation:**

Bioreactor has geotextile fabric (or polyethylene - PE) LINER between the wood chips and the surrounding soil plus the following components: woodchip filled pit, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. The approximate bioreactor excavated pit volume is 333 cubic yards (e.g. 6 feet deep, 15 feet wide and 100 feet long). Woodchips occupy 6 feet of the pit plus 10% crowned (366 cu. yd.) and will be mounded above ground level to shed precipitation. A geotextile fabric (or PE material) LINER surrounds the chips to prevent migration of soil into the pit. Water control structures should be installed using practice standard (587) Structure for Water Control. Two inline water control structures are in place. Upper WCS connected to the upper 6" diameter single-wall CPT manifold pipe (15' each, note that 6' HDPE dual wall is the only type available and used in the scenario components) by 6" diameter dual wall pipe (20' each). 20' of 6" dual wall pipe connects the downstream manifold to the lower WCS which is connected back to the main with additional 20' of 6" dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. 40' of mainline is replaced with non-perforated 10' above and below the upper WCS. The soil excavated from the pit is spoiled onto the nearby field. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554).

**Feature Measure:** Volume of Carbon Source

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 366.0

**Scenario Total Cost:** $24,938.48

**Scenario Cost/Unit:** $68.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 807 | $1,049.10 |
| 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 Yards | $2.12 | 333 | $705.96 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 333 | $1,158.84 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 366 | $17,513.10 |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 50 | $162.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 90 | $105.30 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline Inlet WCS 6' High x 10 in. Dia.connections , 2 baffle (3 compartments) | Each | $1,412.71 | 1 | $1,412.71 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 60 | $742.20 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10 in. | 2204 | Pipe, Corrugated HDPE Double Wall 10 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $7.19 | 40 | $287.60 |

**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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario:** #6 - Denitrifying Bioreactor, without Liner, Soil Cover

**Scenario Description:**

Scenario describes a structure containing a carbon source installed to intercept subsurface drain (tile) flow or ground water, and reduce the concentration of nitrate-nitrogen in subsurface agricultural drainage flow via enhanced denitrification. Woodchips serve as the carbon source necessary to the denitrification process. This bioreactor has the following components: woodchip filled pit, a soil cover, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

**Before Situation:**

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

**After Situation:**

Bioreactor has the following components: woodchip filled pit, a soil cover, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. The approximate bioreactor excavated pit volume is 333 cubic yards (e.g. 6 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the lower 4 feet of the pit (222 cu. yd.) and a soil blanket over the woodchips is 2.0 ft. and will be mounded above ground level to shed precipitation. Water control structures should be installed using practice standard (587) Structure for Water Control. Two inline water control structures are in place. Upper WCS connected to the upper 6' diameter single-wall CPT manifold pipe (15' each, note that 6' HDPE dual wall is the only type available and used in the scenario components) by 6' diameter dual wall pipe (20' each). 20' of 6' dual wall pipe connects the downstream manifold to the lower WCS which is connected back to the main with additional 20' of 6' dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. 40' of mainline is replaced with non-perforated 10' above and below the upper WCS. The soil excavated from the pit is spoiled onto the nearby field. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554).

**Feature Measure:** Volume of Carbon Source

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 222.0

**Scenario Total Cost:** $16,536.14

**Scenario Cost/Unit:** $74.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 333 | $705.96 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 200 | $696.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 222 | $10,622.70 |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 50 | $162.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 90 | $105.30 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline Inlet WCS 6' High x 10 in. Dia.connections , 2 baffle (3 compartments) | Each | $1,412.71 | 1 | $1,412.71 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 60 | $742.20 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10 in. | 2204 | Pipe, Corrugated HDPE Double Wall 10 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $7.19 | 40 | $287.60 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario:** #16 - Denitrifying Bioreactor, with liner and soil cover

**Scenario Description:**

Scenario describes a structure containing a carbon source installed to intercept subsurface drain (tile) flow or ground water, and reduce the concentration of nitrate-nitrogen in subsurface agricultural drainage flow via enhanced nitrification. Woodchips serve as the carbon source necessary to the denitrification process. This bioreactor has a geotextile fabric (or polyethylene - PE) LINER between the wood chips and the surrounding soil plus the following components: woodchip filled pit, a soil cover, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

**Before Situation:**

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

**After Situation:**

Bioreactor has geotextile fabric (or polyethylene - PE) LINER between the wood chips and the surrounding soil plus the following components: woodchips occupying the lower 4 feet of the pit (222 cy) and a 2 foot soil blanket over the wood chips that will be mounded above ground level to shed precipitation, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. The approximate bioreactor excavated pit volume is 333 cubic yards (e.g. 6 feet deep, 15 feet wide and 100 feet long). Woodchips occupy 4 feet of the pit and a soil cover occupies the remaining 2 feet, plus 10% crowned and will be mounded above ground level to shed precipitation. A geotextile fabric (or PE material) LINER surrounds the chips to prevent migration of soil into the pit. Water control structures should be installed using practice standard (587) Structure for Water Control. Two inline water control structures are in place. Upper WCS connected to the upper 6" diameter single-wall CPT manifold pipe (15' each, note that 6' HDPE dual wall is the only type available and used in the scenario components) by 6" diameter dual wall pipe (20' each). 20' of 6" dual wall pipe connects the downstream manifold to the lower WCS which is connected back to the main with additional 20' of 6" dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. 40' of mainline is replaced with non-perforated 10' above and below the upper WCS. The soil excavated from the pit is spoiled onto the nearby field. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554).

**Feature Measure:** Volume of Carbon Source

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 222.0

**Scenario Total Cost:** $17,585.24

**Scenario Cost/Unit:** $79.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 807 | $1,049.10 |
| 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 Yards | $2.12 | 333 | $705.96 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 200 | $696.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 222 | $10,622.70 |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 50 | $162.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 90 | $105.30 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline Inlet WCS 6' High x 10 in. Dia.connections , 2 baffle (3 compartments) | Each | $1,412.71 | 1 | $1,412.71 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 60 | $742.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10 in. | 2204 | Pipe, Corrugated HDPE Double Wall 10 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $7.19 | 40 | $287.60 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario:** #17 - Denitrifying Bioreactor, without liner, no soil cover

**Scenario Description:**

Scenario describes a structure containing a carbon source installed to intercept subsurface drain (tile) flow or ground water, and reduce the concentration of nitrate-nitrogen in subsurface agricultural drainage flow via enhanced nitrification. Woodchips serve as the carbon source necessary to the denitrification process. This bioreactor includes the following components: woodchip filled pit, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

**Before Situation:**

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

**After Situation:**

Bioreactor the following components: woodchip filled pit, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. The approximate bioreactor excavated pit volume is 333 cubic yards (e.g. 6 feet deep, 15 feet wide and 100 feet long). Woodchips occupy 6 feet of the pit plus 10% crowned (366 cu. yd.) and will be mounded above ground level to shed precipitation. Water control structures should be installed using practice standard (587) Structure for Water Control. Two inline water control structures are in place. Upper WCS connected to the upper 6" diameter single-wall CPT manifold pipe (15' each, note that 6' HDPE dual wall is the only type available and used in the scenario components) by 6" diameter dual wall pipe (20' each). 20' of 6" dual wall pipe connects the downstream manifold to the lower WCS which is connected back to the main with additional 20' of 6" dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. 40' of mainline is replaced with non-perforated 10' above and below the upper WCS. The soil excavated from the pit is spoiled onto the nearby field. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554).

**Feature Measure:** Volume of Carbon Source

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 366.0

**Scenario Total Cost:** $23,889.38

**Scenario Cost/Unit:** $65.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 333 | $705.96 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 333 | $1,158.84 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 366 | $17,513.10 |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 50 | $162.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 90 | $105.30 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline Inlet WCS 6' High x 10 in. Dia.connections , 2 baffle (3 compartments) | Each | $1,412.71 | 1 | $1,412.71 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only. | Each | $310.62 | 1 | $310.62 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $12.37 | 60 | $742.20 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10 in. | 2204 | Pipe, Corrugated HDPE Double Wall 10 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $7.19 | 40 | $287.60 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario:** #21 - Denitrifying Bioreactor Recharge

**Scenario Description:**

Recharge of an existing denitrifying bioreactor that was designed and installed to meet NRCS standards. Recharge is needed when the bioreactor has operated for its 10-year design life. The water control structure will be re-used. The wood chips will be replaced along with the distribution and collection pipe plumbing and the liner in the bioreactor chamber. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554), Critical Area Planting (342). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor, as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

**Before Situation:**

Before the recharge installation, the existing bioreactor has operated for its 10-year design life and is no longer removing the nitrates from the drainage water. The wood chip media have broken down and are clogging the perforations in the distribution and collection pipes. The subsurface drainage system is once again contributing significant nitrates to surface water.

**After Situation:**

After recharge, the bioreactor is again functioning to remove nitrates from drainage water as designed. Bioreactor has new 6” corrugated plastic tubing in the bioreactor chamber, and new wood chip media. Wood chips occupy the lower 4 feet of the pit (222 cy), with a new geotextile fabric liner above the wood chips (15 feet wide by 100 feet long), and 2 feet of soil cover on top plus 10% mounded above ground level to shed precipitation. If the newly constructed soil cover will not be cropped, revegetate using Critical Area Planting (342).

**Feature Measure:** Volume of Carbon Source

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 222.0

**Scenario Total Cost:** $13,334.12

**Scenario Cost/Unit:** $60.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 520 | $676.00 |
| 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 Yards | $2.12 | 333 | $705.96 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.48 | 120 | $417.60 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yards | $47.85 | 222 | $10,622.70 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 30 | $35.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #1 - <= 5in CPP

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $4,210.28

**Scenario Cost/Unit:** $2.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 2000 | $2,540.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, 5 in., PCPT, Single Wall | 1271 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only. | Feet | $0.71 | 2000 | $1,420.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #2 - 6in CPP

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes construction of 2,000 feet of 6-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $5,130.28

**Scenario Cost/Unit:** $2.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 2000 | $2,540.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 2000 | $2,340.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #3 - 8in CPP

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 8-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $10,330.28

**Scenario Cost/Unit:** $5.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 2000 | $6,480.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, 8 in,, PCPT, Single Wall | 1272 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8 inch diameter - ASTM F667. Material cost only. | Feet | $1.80 | 2000 | $3,600.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #4 - 10in CPP

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 10-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $13,210.28

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 2000 | $6,480.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, 10 in., PCPT, Single Wall | 1273 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10 inch diameter - ASTM F667. Material cost only. | Feet | $3.24 | 2000 | $6,480.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #5 - 12in CPP

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 12-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $15,230.28

**Scenario Cost/Unit:** $7.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 2000 | $6,480.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, 12 in., PCPT, Single Wall | 1274 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only. | Feet | $4.25 | 2000 | $8,500.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #6 - >= 15in CPP

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 15-inch, twin-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $27,614.28

**Scenario Cost/Unit:** $13.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $3.24 | 2000 | $6,480.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced | 1588 | High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only. | Pound | $2.27 | 9200 | $20,884.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #7 - Enveloped Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 inch

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline with Sand-Gravel envelope, using a drainage trencher. Scenario includes the construction of 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet, and surrounded with a sand-gravel envelope. The unit is in weight of pipe material in pounds. 2,000 feet of 5-inch, Single-Wall, perforated HDPE CPP weighs 0.50 lb/ft, or a total of 1,000 pounds. The typical volume sand-gravel for 2,000 feet of 12"wide x 12" high envelope is 64 cubic yards. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices including (but not limited to) perimeter drainage around a waste storage facility. Resource Concerns: Excess Water (seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) waste storage facilities have a high failure rate due to uplift pressures damaging the integrity of the facility, particularly in high water table areas.

**After Situation:**

The drainage modifications result in reduced water in the upper horizons of the soil profile, preventing uplift pressures from damaging the integrity of installed structures. Excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due decreased erosion.

**Feature Measure:** length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $8,688.32

**Scenario Cost/Unit:** $4.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $88.81 | 8 | $710.48 |
| Trenching, Earth, 12 in. x 60 in. | 1459 | Trenching, earth, 12 inch wide x 60 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling. | Feet | $1.67 | 2000 | $3,340.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 64 | $1,964.80 |
| Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $1.63 | 1000 | $1,630.00 |
| Drainage Lateral Connection | 1458 | Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $24.81 | 3 | $74.43 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 606 - Subsurface Drain

**Scenario:** #8 - Secondary Main Retrofit for DWM

**Scenario Description:**

An agricultural field has existing patterned tile system installed at 75 foot spacings. The field is 75 acres in size: 2475' x 1320', with a single main line at the low end of the field (2475'). The laterals are installed perpendicular to the topographic contours. The field has 3.5 feet of fall in the 1/4 mile length of the laterals, so a secondary main will be needed to allow drainage water management to be implemented on the higher half of the field.

**Before Situation:**

The patterned tile drainage system allows free flow of drainage water to a receiving ditch. Drainage water carries nitrogen and phosphorus out of the soil and these nutrients pollute the receiving waters.

**After Situation:**

A 12 inch diameter secondary mainline is retrofitted to the drainage system, located halfway up the field and relatively parallel to the topographic contours. This new mainline is hooked to each individual lateral and continued to a stable outlet. A Drainage Water practice must be completed along with the mainline; typically Structures for Water Control (587) installed at two foot vertical intervals so that water can be retained in the field. This scenario also applies to systems where the secondary main is used to connect drain lines that formerly each exited separately to the ditch, with a structure that distributes the drainage water into the subsurface soil at a vegetated buffer (772) OR a Denitrifying Bioreactor (747) might be installed at the outlet. In combination or singly, one of these practices must be installed with the secondary main.

**Feature Measure:** Feet of Pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,135.0

**Scenario Total Cost:** $20,990.92

**Scenario Cost/Unit:** $6.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, tile line plowing, earth, 60 in. | 1457 | Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling. | Feet | $2.04 | 3135 | $6,395.40 |
| **Materials** | | | | | | |
| Pipe, HDPE, 12 in., PCPT, Single Wall | 1274 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only. | Feet | $4.25 | 3135 | $13,323.75 |
| Drainage Lateral Connection | 1458 | Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $24.81 | 32 | $793.92 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #1 - Direct Seeding

**Scenario Description:**

This practice involves planting of tree and shrubs through direct seeding after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes tree seed, equipment and labor to seed, and foregone income for the land taken out of crop production. 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:**

The land has a little or no tree cover and has been intensively row cropped. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

**After Situation:**

Seed from native species are collected or purchased and planted at prescribed rates. 5 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $5,875.02

**Scenario Cost/Unit:** $1,175.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 5 | $52.00 |
| 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. | Acres | $11.75 | 5 | $58.75 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 2.5 | $805.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 2.5 | $813.90 |
| **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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Trees and shrubs, seed | 1871 | Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only. | Pound | $8.78 | 400 | $3,512.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #2 - Direct Seeding, no Foregone Income

**Scenario Description:**

This practice involves planting of tree and shrubs through direct seeding after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes tree seed and equipment and labor to seed. 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:**

The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

**After Situation:**

Seed from native species are collected or purchased and planted at prescribed rates. 5 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $4,255.89

**Scenario Cost/Unit:** $851.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 5 | $52.00 |
| 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. | Acres | $11.75 | 5 | $58.75 |
| **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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Trees and shrubs, seed | 1871 | Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only. | Pound | $8.78 | 400 | $3,512.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #3 - Hardwood Establishment, Bareroot

**Scenario Description:**

This practice involves planting of bare-root hardwood tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 436 trees per acre (10' x 10' spacing). Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of crop production. 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:**

The land has a little or no tree cover and has been intensively row cropped. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

**After Situation:**

The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $10,608.74

**Scenario Cost/Unit:** $1,060.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| 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. | Hours | $5.83 | 4 | $23.32 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 4360 | $6,627.20 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #5 - Shrub Establishment, Bareroot

**Scenario Description:**

This practice involves planting of bare-root shrub seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 1210 shrubs per acre (6' x 6' spacing). Plantings are in either uplands or bottomlands. The site lacks ground level habitat structure and diversity for wildlife. Resource concern is inadequate habitat for fish and wildlife - habitat fragmentation. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of crop production. 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:**

The land has a little or no shrubby cover and has been intensively row cropped. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in topsoil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition.

**After Situation:**

Multiple small blocks of shrubs are planted that total 1 acre. The blocks are based on a habitat appraisal that determines the specific size and location to maximize habitat structure and diversity.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,436.09

**Scenario Cost/Unit:** $2,436.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| 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. | Hours | $11.47 | 4 | $45.88 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 1210 | $1,706.10 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #6 - Conifer Establishment, Bareroot

**Scenario Description:**

This practice involves planting of bare-root conifer tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 436 trees per acre (10' x 10' spacing). Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of crop production. 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:**

The land has a little or no tree cover and has been intensively row cropped. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

**After Situation:**

The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,731.14

**Scenario Cost/Unit:** $773.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| 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. | Hours | $5.83 | 4 | $23.32 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.86 | 4360 | $3,749.60 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #7 - Bareroot Trees and Shrubs, Each

**Scenario Description:**

Bare-root trees and/or shrubs to be planted or interplanted to establish woody plants in any area where they can be grown for wildlife, erosion control, water quality improvement, carbon sequestration, forest products, and aesthetics. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant. Foregone income is not included with this scenario. 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:**

The land has little/no tree cover, is understocked, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition

**After Situation:**

The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Each

**Scenario Typical Size:** 4,360.0

**Scenario Total Cost:** $7,413.49

**Scenario Cost/Unit:** $1.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 4 | $43.00 |
| 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. | Hours | $5.83 | 4 | $23.32 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 4360 | $6,627.20 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #8 - Bareroot Trees and Shrubs, with Tree Shelters, Each

**Scenario Description:**

Bare-root trees and/or shrubs to be planted or interplanted to establish woody plants in any area where they can be grown for wildlife, erosion control, water quality improvement, carbon sequestration, forest products, and aesthetics. Seedlings are protected from deer browsing by installing tree tube shelters. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, tree shelters, and equipment and labor to plant and install shelters. Foregone income is not included with this scenario. 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:**

The land has little/no tree cover, is understocked, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in topsoil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition.

**After Situation:**

The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Each

**Scenario Typical Size:** 4,360.0

**Scenario Total Cost:** $18,988.77

**Scenario Cost/Unit:** $4.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 4 | $43.00 |
| 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. | Hours | $5.83 | 4 | $23.32 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 4360 | $6,627.20 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials only. | Each | $1.72 | 4360 | $7,499.20 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 8720 | $523.20 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $0.77 | 4360 | $3,357.20 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #50 - Hardwood Establishment, Bareroot, Pasture Conversion

**Scenario Description:**

This practice involves planting of bare-root tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 500 trees per acre. Tree tube shelters are placed on 10% of the seedlings to reduce damage from deer browsing. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of grazing production. 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:**

The land has a little or no tree cover and has been in pasture. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

**After Situation:**

The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $9,209.51

**Scenario Cost/Unit:** $920.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 2 | $21.50 |
| 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. | Hours | $5.83 | 4 | $23.32 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 26 | $498.94 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 5000 | $7,600.00 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials only. | Each | $1.72 | 50 | $86.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 100 | $6.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $0.77 | 500 | $385.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario:** #53 - Bareroot Trees and Shrubs, Hand Planting

**Scenario Description:**

This practice involves hand planting of bare-root tree seedlings in an existing woodland. The productivity of the site is good and will support a planting rate of 300 trees per acre. Plantings are in either uplands or bottomlands. The site lacks ground level habitat structure and diversity for wildlife and degraded plant condition. Payment includes bare-root seedlings, and equipment and labor to hand plant seedlings. 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:**

The land is an existing woodland where diversity of trees and wildlife habitat is lacking. The main resource concerns are degraded plant condition - inadequate structure and composition, and fish and wildlife – inadequate habitat (cover/shelter) and/or inadequate food.

**After Situation:**

The land is regenerated with permanent tree cover that will improve degraded plant condition and wildlife habitat structure and diversity.

**Feature Measure:** Each Tree or Shrub

**Scenario Unit:** Each

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $5,329.97

**Scenario Cost/Unit:** $3.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 17 | $402.39 |
| 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. | Hours | $11.47 | 34 | $389.98 |
| **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. | Hours | $24.46 | 34 | $831.64 |
| 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. | Hours | $41.94 | 34 | $1,425.96 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 1500 | $2,280.00 |

**Practice:** 614 - Watering Facility

**Scenario:** #1 - Permanent Tank, <450 gallons

**Scenario Description:**

A permanent watering facility constructed of approved materials with less than 450 gallons of capacity that provides adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the watering tank, float valve and wildlife escape ramp. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility with a capacity of less than 450 gallons is typically installed for 30 animal units with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561), as appropriate.

**Feature Measure:** Number of Watering Points

**Scenario Unit:** Each

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $2,935.35

**Scenario Cost/Unit:** $587.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 10 | $236.70 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound | Each | $63.01 | 5 | $315.05 |
| Tank, Galvanized, 400 gallon | 279 | Tank Galvanized - 400 gallon capacity | Each | $293.58 | 5 | $1,467.90 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $81.21 | 5 | $406.05 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 101 | $195.94 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 614 - Watering Facility

**Scenario:** #2 - Portable Tank

**Scenario Description:**

Establishment of a portable watering facility for livestock as part of an intensively managed grazing system where the livestock are frequently moved. Payment includes the watering tank and float valve. If needed, a stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). Payment is per portable tank.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

This practice is typically installed for 30 animal units. It consists of a portable trough of either durable plastic, steel, or rubber that provides adequate water and access for the livestock. The trough includes a float for control of inflow of water. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: Pipeline (516), Critical Area Planting (342), Water Harvesting Catchment (636), Water Well (642), Pumping Plant (533), Spring Development (574), and Heavy Use Area Protection (561).

**Feature Measure:** Number of Portable Tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $194.40

**Scenario Cost/Unit:** $194.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $113.19 | 1 | $113.19 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $81.21 | 1 | $81.21 |

**Practice:** 614 - Watering Facility

**Scenario:** #3 - Tire Tank

**Scenario Description:**

A permanent watering facility constructed from a rubber tire that provides an adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the watering tank, float valve, wildlife escape ramp, and freeze proof hydrant. A stabilized area around the watering facility is not included and must be addressed through associated practices of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

This practice is typically installed for 50 animal units. It consists of a necessarily large rubber tire trough, that provides adequate water and access for the livestock. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: Pipeline (516), Critical Area Planting (342), Water Harvesting Catchment (636), Water Well (642), Pumping Plant (533), Spring Development (574), and Heavy Use Area Protection (561). Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561), as appropriate.

**Feature Measure:** Number of Watering Points

**Scenario Unit:** Each

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $6,068.70

**Scenario Cost/Unit:** $1,213.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 1.6 | $291.87 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 10 | $312.90 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 10 | $236.70 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 10 | $300.60 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound | Each | $63.01 | 5 | $315.05 |
| Tank, Tire, 8' diameter | 286 | Tire, includes material cost for tank and shipping. Labor and other appurtenance costs not included. | Each | $689.12 | 5 | $3,445.60 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $81.21 | 5 | $406.05 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 101 | $195.94 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 614 - Watering Facility

**Scenario:** #4 - Large Permanent Tank, 450 -1000 gallons, or Fountain

**Scenario Description:**

Establishment of a large permanent watering facility using materials such as a large concrete trough or fountain type watering facilities. Payment includes materials and labor costs for installing the watering tank, float valve and wildlife escape ramp. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561).

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

This practice is typically installed for 50 animal units. It consists of a necessarily large permanent concrete trough, or fountain type watering facility that provides adequate water and access for the livestock. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: Pipeline (516), Critical Area Planting (342), Water Harvesting Catchment (636), Water Well (642), Pumping Plant (533), Spring Development (574), and Heavy Use Area Protection (561). Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561), as appropriate.

**Feature Measure:** Number of Watering Points

**Scenario Unit:** Each

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $6,095.60

**Scenario Cost/Unit:** $1,219.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 15 | $355.05 |
| **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. | Hours | $24.46 | 15 | $366.90 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound | Each | $63.01 | 5 | $315.05 |
| Tank, Concrete, 500 gallon | 1049 | Concrete tank for water storage, with riser and lid. Includes materials and delivery | Each | $877.50 | 5 | $4,387.50 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $81.21 | 5 | $406.05 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 101 | $195.94 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 614 - Watering Facility

**Scenario:** #5 - Above Ground Storage, 1,000 - 3,000 gallons

**Scenario Description:**

A permanent watering facility constructed of approved materials having 1,000 to 3,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility with water storage capacity of 1,000 to 3,000 gallons is typically installed for 30 animal units to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** Number of tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,238.57

**Scenario Cost/Unit:** $2,238.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 2 | $62.58 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 2 | $60.12 |
| **Materials** | | | | | | |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $0.67 | 2500 | $1,675.00 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 13 | $25.22 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 614 - Watering Facility

**Scenario:** #6 - Above Ground Storage, >3,000 gallons

**Scenario Description:**

Establishment of a large permanent watering facility having 3,001 to 5,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility with water storage capacity of 3,001 to 5,000 gallons is typically installed for 50 animal units to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** Number of tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,688.05

**Scenario Cost/Unit:** $3,688.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 3 | $93.87 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 3 | $71.01 |
| **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. | Hours | $24.46 | 3 | $73.38 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 3 | $90.18 |
| **Materials** | | | | | | |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $0.67 | 4500 | $3,015.00 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 13 | $25.22 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 614 - Watering Facility

**Scenario:** #7 - Underground Storage Tank

**Scenario Description:**

A precast concrete tank used for storing water as part of a watering system. The storage tank will consist of 1 storage tank (2500 gal.) adequate base material and backfill around the tank, access riser with lid, and 20 ft of 4 inch for overflow pipe.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility for livestock constructed of approved materials with a 2,500 gallons of additional storage capacity for adequate quantity and quality of water for storage when backup capacity is needed peak water demand periods. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate.

**Feature Measure:** Number of tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,972.36

**Scenario Cost/Unit:** $4,972.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 5 | $535.30 |
| **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. | Hours | $24.46 | 5 | $122.30 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 5 | $150.30 |
| **Materials** | | | | | | |
| Tank, Concrete, 2500 gallon | 1055 | Concrete tank for water storage, with riser and lid. Includes materials and delivery. | Each | $3,493.36 | 1 | $3,493.36 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 2 | $46.54 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $1.94 | 40 | $77.60 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 614 - Watering Facility

**Scenario:** #8 - Frost Free Waterer

**Scenario Description:**

A permanent watering facility constructed of approved materials that provides adequate quantity and quality of water for direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the frost free waterer. The stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility is typically installed for 30 animal units with all waterer materials to provide an adequate supply and quality of water for livestock or wildlife for direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentration will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** Number of Waterers

**Scenario Unit:** Each

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $6,996.44

**Scenario Cost/Unit:** $1,399.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 10 | $312.90 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 10 | $236.70 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 10 | $300.60 |
| **Materials** | | | | | | |
| Tank, Geothermal Tube Waterer | 1062 | Two head 18 gallon waterer. Includes materials and shipping only. | Each | $1,035.24 | 5 | $5,176.20 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $81.21 | 5 | $406.05 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 614 - Watering Facility

**Scenario:** #9 - Access Ramp

**Scenario Description:**

The bank of the stream or pond is severely eroded and water quality is poor due to the unrestricted access of livestock or wildlife. A conservation plan includes provisions for controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, or provide a water source that is an alternative to a sensitive resource.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering ramp with a level section at the base is installed to provide drinking water for livestock or wildlife. The access ramp is constructed of approved materials consisting of rock and or gravel surfacing on geotextile fabric foundation, with a life expectancy that meets or exceeds the planned useful life of the installation. The resource concerns of inadequate supply of water for livestock or wildlife, soil erosion, habitat degradation, water quality, and undesirable plant productivity and health have been addressed. The watering facility includes all materials, equipment, and labor to shape the ramp and install the surfacing material. Seeding of berms and construction areas is to be specified using 342 - Critical Area Planting, and 484 - Mulching, as needed. Use 382 - Fence to limit livestock access.

**Feature Measure:** Area of access ramp

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 560.0

**Scenario Total Cost:** $1,570.61

**Scenario Cost/Unit:** $2.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 84 | $109.20 |
| 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. | Hours | $128.05 | 3 | $384.15 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 3 | $90.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 24 | $736.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #2 - <= 5in Diameter Pipe with Risers

**Scenario Description:**

Scenario is for the Installation of a 5" or less diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, perforated PVC riser inlet, trench excavation, and trench backfill. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled after UGO is installed in association with terraces or water and sediment control basin. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,501.28

**Scenario Cost/Unit:** $3.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 500 | $635.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SDR 35 | 992 | Materials: - 4 inch - PVC - SDR 35 - ASTM D3034 | Feet | $1.98 | 20 | $39.60 |
| Inlet, riser, 6 in. | 1261 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 6 inch diameter. Materials only. | Each | $73.84 | 2 | $147.68 |
| Pipe, HDPE, 5 in., PCPT, Single Wall | 1271 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only. | Feet | $0.71 | 480 | $340.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #4 - 6in Diameter Pipe with Risers

**Scenario Description:**

Scenario is for the Installation of a 6" diameter approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Payment includes pipe, perforated PVC riser inlet, trench excavation, and trench backfill. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled after UGO is intalled in association with terraces or water and sediment control basin. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,771.48

**Scenario Cost/Unit:** $3.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 500 | $635.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $4.45 | 20 | $89.00 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 480 | $561.60 |
| Inlet, riser, 6 in. | 1261 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 6 inch diameter. Materials only. | Each | $73.84 | 2 | $147.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #6 - 8in Diameter Pipe with Risers

**Scenario Description:**

Scenario is for the Installation of a 8" diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, perforated PVC riser inlet, trench excavation, and trench backfill. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled after UGO is installed in association with terraces or water and sediment control basin. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $2,910.90

**Scenario Cost/Unit:** $5.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 500 | $1,315.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $8.00 | 20 | $160.00 |
| Inlet, riser, 8 in. | 1262 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only. | Each | $116.85 | 2 | $233.70 |
| Pipe, HDPE, 8 in,, PCPT, Single Wall | 1272 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8 inch diameter - ASTM F667. Material cost only. | Feet | $1.80 | 480 | $864.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #8 - 10in Diameter Pipe with Risers

**Scenario Description:**

Scenario is for the Installation of a 10" diameter approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Payment includes pipe, perforated PVC riser inlet, trench excavation, and trench backfill. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled after UGO is intalled in association with terraces or water and sediment control basin. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $4,096.44

**Scenario Cost/Unit:** $8.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, clay, 24 in. x 48 in. | 55 | Trenching, earth, clay, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling and | Feet | $3.09 | 500 | $1,545.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 10 in., SDR 35 | 1251 | Pipe, PVC, SDR 35, 10 inch Diameter - ASTM D3034. Material cost only. | Feet | $12.52 | 20 | $250.40 |
| Inlet, riser, 10 in. | 1263 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10 inch diameter. Materials only. | Each | $161.88 | 2 | $323.76 |
| Pipe, HDPE, 10 in., PCPT, Single Wall | 1273 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10 inch diameter - ASTM F667. Material cost only. | Feet | $3.24 | 480 | $1,555.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #10 - >=12in Diameter Pipe with Risers

**Scenario Description:**

Scenario is for the Installation of a 12" diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, perforated PVC riser inlet, trench excavation, and trench backfill. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled after UGO is installed in association with terraces or water and sediment control basin. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $5,447.90

**Scenario Cost/Unit:** $10.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, clay, 24 in. x 48 in. | 55 | Trenching, earth, clay, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling and | Feet | $3.09 | 500 | $1,545.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 12 in., SDR 35 | 1252 | Pipe, PVC, SDR 35, 12 inch Diameter - ASTM D3034. Material cost only. | Feet | $17.91 | 20 | $358.20 |
| Inlet, riser, 12 in. | 1264 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12 inch diameter. Materials only. | Each | $541.31 | 2 | $1,082.62 |
| Pipe, HDPE, 12 in., PCPT, Single Wall | 1274 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only. | Feet | $4.25 | 480 | $2,040.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #11 - Blind Inlet

**Scenario Description:**

Install an excavated earthen box with perforated collector tubing placed in the bottom and filled to the surface with bedding material and rock riprap to direct surface flow into a "main line" or subsurface drain. Typically installed at the upper end of a waterway to protect the vegetation of the waterway from prolonged surface flow, thus facilitating vegetative growth and controlling ephemeral gully erosion. Costs include the collection pipe, excavation, and rock. This practice is often installed in conjunction with waterways or simlar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled through the installation of the blind inlet and grassed waterway. Vegetation is successfully established within the waterway. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,869.86

**Scenario Cost/Unit:** $71.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.17 | 30 | $65.10 |
| 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 Yards | $1.40 | 30 | $42.00 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 15 | $1,443.45 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 15 | $460.50 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 40 | $46.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 620 - Underground Outlet

**Scenario:** #13 - Trickle Flow Collector

**Scenario Description:**

Install a perforated pipe to collect surface flow and redirect water to a subsurface outlet. The Trickle Flow Collector consists of a rock/rip rap area bedded around the perforated pipe to trap sediment prior to outletting water. Scenario describes a 10' long by 30' wide by 1.5' deep rectangular shaped area lined with riprap. This scenario includes the installation of pipe in the bottom of the rock bedding to serve as a trickle flow collector. These typically are installed adjacent to waterway and with same flow dimensions. Half the flow channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Cost include excavation, spoiling of excess material, geotextile underlayment and installing Rock Riprap. TFC area is measured from upstream to downstream flow catchment area.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Erosion is occuring in areas that cannot maintain established vegetation and are not otherwise protected. Water quality is compromised as nutrient/pesticide-laden sediments are leaving the site. Water quantity is also a concern as excessive surface water flow is contributing to gully erosion.

**After Situation:**

Rock lined area is 10' long by 30' wide by 1.5' deep. This armor will result in a protected surface to address the initial concern of erosion. Placement of the perforated pipe and rock/rip rap bedding will not only armor the surface area from erosion, but will provide a filter for trapping sediment laden with nutrients and/or pesticides, to result in an improvement to water quality. Area is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Feature Measure:** Width of collector area (ft)

**Scenario Unit:** Feet

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $2,204.55

**Scenario Cost/Unit:** $73.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 22 | $46.64 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yards | $96.23 | 13 | $1,250.99 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 13 | $399.10 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $3.73 | 40 | $149.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #14 - <=5in Diameter Pipe

**Scenario Description:**

Scenario is for the Installation of a 5" or less diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, trench excavation, and trench backfill. The typical use for this scenario is non-pressure underground outlet for roof runoff management and non-perforated outlet for upstream drainage installed adjacent to a wetland.

**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:**

Excessive sedimentation and soil erosion is controlled 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), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,353.60

**Scenario Cost/Unit:** $2.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 500 | $635.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SDR 35 | 992 | Materials: - 4 inch - PVC - SDR 35 - ASTM D3034 | Feet | $1.98 | 20 | $39.60 |
| Pipe, HDPE, 5 in., PCPT, Single Wall | 1271 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only. | Feet | $0.71 | 480 | $340.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #15 - 6in Diameter Pipe

**Scenario Description:**

Scenario is for the Installation of a 6" diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, trench excavation, and trench backfill. The typical use for this scenario is non-pressure underground outlet for roof runoff management and non-perforated outlet for upstream drainage installed adjacent to a wetland.

**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:**

Excessive sedimentation and soil erosion is controlled 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), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,623.80

**Scenario Cost/Unit:** $3.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 500 | $635.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $4.45 | 20 | $89.00 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 480 | $561.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #16 - 8in Diameter Pipe

**Scenario Description:**

Scenario is for the Installation of a 8" diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, trench excavation, and trench backfill. The typical use for this scenario is non-pressure underground outlet for roof runoff management and non-perforated outlet for upstream drainage installed adjacent to a wetland.

**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:**

Excessive sedimentation and soil erosion is controlled 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), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $2,907.20

**Scenario Cost/Unit:** $5.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, clay, 24 in. x 48 in. | 55 | Trenching, earth, clay, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling and | Feet | $3.09 | 500 | $1,545.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $8.00 | 20 | $160.00 |
| Pipe, HDPE, 8 in,, PCPT, Single Wall | 1272 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8 inch diameter - ASTM F667. Material cost only. | Feet | $1.80 | 480 | $864.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #17 - 10in Diameter Pipe

**Scenario Description:**

Scenario is for the Installation of a 10" diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, trench excavation, and trench backfill. The typical use for this scenario is non-pressure underground outlet for roof runoff management and non-perforated outlet for upstream drainage installed adjacent to a wetland.

**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:**

Excessive sedimentation and soil erosion is controlled 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), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $3,772.68

**Scenario Cost/Unit:** $7.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, clay, 24 in. x 48 in. | 55 | Trenching, earth, clay, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling and | Feet | $3.09 | 500 | $1,545.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 10 in., SDR 35 | 1251 | Pipe, PVC, SDR 35, 10 inch Diameter - ASTM D3034. Material cost only. | Feet | $12.52 | 20 | $250.40 |
| Pipe, HDPE, 10 in., PCPT, Single Wall | 1273 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10 inch diameter - ASTM F667. Material cost only. | Feet | $3.24 | 480 | $1,555.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #18 - >=12in Diameter Pipe

**Scenario Description:**

Scenario is for the Installation of a 12" diameter approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Payment includes pipe, trench excavation, and trench backfill. The typical use for this scenario is non-pressure underground outlet for roof runoff management and non-perforated outlet for upstream drainage installed adjacent to a wetland.

**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:**

Excessive sedimentation and soil erosion is controlled 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), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $4,365.28

**Scenario Cost/Unit:** $8.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, clay, 24 in. x 48 in. | 55 | Trenching, earth, clay, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling and | Feet | $3.09 | 500 | $1,545.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.02 | 2 | $4.04 |
| **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. | Hours | $41.94 | 4 | $167.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 12 in., SDR 35 | 1252 | Pipe, PVC, SDR 35, 12 inch Diameter - ASTM D3034. Material cost only. | Feet | $17.91 | 20 | $358.20 |
| Pipe, HDPE, 12 in., PCPT, Single Wall | 1274 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only. | Feet | $4.25 | 480 | $2,040.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 620 - Underground Outlet

**Scenario:** #61 - Perforated Pipe Riser

**Scenario Description:**

Scenario is for the Installation of approved perforated plastic pipe riser to convey storm water from one location to a suitable and stable outlet. Payment includes perforated PVC riser inlet, stone. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

**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.

**After Situation:**

Excessive sedimentation and soil erosion is controlled after perforated plastic pipe riser is installed in association with terraces or water and sediment control basin. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606).

**Feature Measure:** Number of Risers

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $296.60

**Scenario Cost/Unit:** $296.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 10 | $26.30 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 1 | $30.70 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.17 | 10 | $11.70 |
| Inlet, riser, 8 in. | 1262 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only. | Each | $116.85 | 1 | $116.85 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** 629 - Waste Treatment

**Scenario:** #1 - Poultry Litter Gasifier

**Scenario Description:**

This practice scenario includes gasification of poultry litter to reduce the volume of Phospohorus to be spread (as ash). The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). In addition, energy is captured as heat from the process. Associated practices: Amendments for Treatment of Agricultural Waste (591), Waste Storage Facility (313), & Nutrient Management (590)

**Before Situation:**

A poultry operation typically removes part of the litter and bedding between flocks, called a cakeout. A full cleanout of litter and bedding is typically done once every 1-3 years depending on the operation. Over time, the accumulation of poultry waste in the litter contributes to an increase in odors and high ammonia emissions in the house contribute to impacts on bird health.

**After Situation:**

The poultry litter gasification system is in place to accept litter from the adjacent barn or litter stacking area. The gasifier reduces the poultry litter to a more compact, dry ash that can more eaily be hauled long distances to take to fields with lower P soil values. Energy produced by the gasifier can be used to heat the poultry house, providing a drier, healthier environment for the birds.

**Feature Measure:** Each poultry farm

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $238,600.00

**Scenario Cost/Unit:** $238,600.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Manure Gasifier, (200lb/hour) | 1748 | Gasifier unit with the capacity to process up to 200 pounds per hour. Unit includes gasifier system, feed bin(s), and processing unit. Includes equipment and shipping only. | Each | $238,600.00 | 1 | $238,600.00 |

**Practice:** 629 - Waste Treatment

**Scenario:** #2 - Milking Parlor Waste Treatment System with Dosing System

**Scenario Description:**

This practice scenario includes a dosed treatment system for milking parlor wastewater that will outlet to a constructed wetland and/or vegetated treatment area and/or other acceptable treatment. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: Constructed Wetland (656), Vegetated Treatment Area (635), Waste Transfer (634), Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313)

**Before Situation:**

Milkhouse waste water currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

**After Situation:**

This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to a treatment area (constructed wetland and/or vegetated treatment area and/or other acceptable treatment). This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,722.15

**Scenario Cost/Unit:** $8,722.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 100 | $551.00 |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 450 | $571.50 |
| 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 Yards | $3.71 | 120 | $445.20 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $3.73 | 200 | $746.00 |
| Pipe, PE, 3 in., DR 9 | 1001 | Materials: - 3 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $4.28 | 250 | $1,070.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 5 | $116.35 |
| Prefabricated concrete septic tank, 1500 gal | 1738 | Precast concrete septic tank, 1,500 gal. Materials only. | Each | $1,824.33 | 2 | $3,648.66 |
| Dosing System, siphon | 1763 | Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only. | Each | $245.06 | 1 | $245.06 |
| **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 | $69.11 | 1 | $69.11 |
| 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 | $168.33 | 1 | $168.33 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $477.85 | 1 | $477.85 |

**Practice:** 632 - Waste Separation Facility

**Scenario:** #1 - Earthen Settling Structure

**Scenario Description:**

An earthen structure, such as a basin or a terrace or dike like structure, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. A concrete pad should be installed on the bottom of the basin and around outlet structures to facilitate cleanout. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One earthen settling basin structure (60 ft wide by 200 ft long by 3 ft deep, with three screening outlet structures) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

**Feature Measure:** Cubic Foot of Total Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 30,000.0

**Scenario Total Cost:** $10,269.61

**Scenario Cost/Unit:** $0.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 12 | $4,408.32 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 1000 | $4,270.00 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 14 | $429.80 |
| Weeping Wall | 1765 | Weeping wall or picket screen structure for solid settling basin. Materials only. | Feet | $22.80 | 24 | $547.20 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 632 - Waste Separation Facility

**Scenario:** #2 - Concrete Basin

**Scenario Description:**

A concrete structure, such as a basin with concrete walls and floor, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One 3' deep concrete settling basin structure (20'x20' flat bottom with 3' walls on 2 sides, 10:1 ramps on other sides, 50'x50' overall footprint) and weeping wall/picket structure or outlet control) constructed at the outlet of a open feedlot. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

**Feature Measure:** Cubic Foot of Total Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 3,900.0

**Scenario Total Cost:** $20,418.39

**Scenario Cost/Unit:** $5.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 33 | $12,122.88 |
| 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 Yards | $487.76 | 12 | $5,853.12 |
| 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 Yards | $2.12 | 50 | $106.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 50 | $213.50 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 38 | $1,166.60 |
| Weeping Wall | 1765 | Weeping wall or picket screen structure for solid settling basin. Materials only. | Feet | $22.80 | 15 | $342.00 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 632 - Waste Separation Facility

**Scenario:** #3 - Concrete Sand Settling Lane

**Scenario Description:**

A concrete structure, a concrete lane with curbs, used to capture and separate a portion of the solids, mainly sand, from a liquid stream from a confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One concrete settling lane structure (25 ft wide by 200 ft long by 0.5 ft thick with 18" walls on each side.) constructed around or at a livestock feeding operation. Removes a portion of the solids (sand) that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

**Feature Measure:** Square Foot of Settling Lane Footpr

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $46,374.79

**Scenario Cost/Unit:** $9.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 78 | $28,654.08 |
| 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 Yards | $487.76 | 30 | $14,632.80 |
| 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 Yards | $2.12 | 180 | $381.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 90 | $384.30 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 62 | $1,903.40 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 632 - Waste Separation Facility

**Scenario:** #4 - Gravity Tank

**Scenario Description:**

A concrete tank used for gravity separation of solid material in a daiy waste management system. The waste management system must utilize a "flush" type system in order to convey and agitate the material. The flush system is needed to maintain high solids removal. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

A concrete tank 20' x 20' x 6' with a full width ramp of 20' x 72'. For a total structure capacity of 6,720 cu ft. Separator description: Dairy manure is flushed into the Gravity Tank (Pull Plug) Separator that utilizes a vertical pipe, surrounded by a baffle, that is open at the top. The vertical pipe maintains 4.5 feet of material in the tank. When the manure is flushed into the tank the level rises in the tank and slowly drains through the baffle, floating mat of fibrous material (roughage from the dairy manure) and the open top of the vertical pipe as the level returns to 4.5 feet. The liquid goes to a storage structure. This process is repeated each time the manure is flushed into the tank, typically 2 times per day. The floating material will form a mat on the surface of the separator, the heavy material will sink to the bottom of the separator. Eventually the floating mat and the heavy material will meet and the tank level will not return to 4.5 feet. The basin will continue to be used a few more weeks. This helps to dewater the separated solids. When the separator is ready to be cleaned out the vertical pipe (Pull Plug) is removed and the basin dewaters for 12 to 24 hours. The solids are removed. The vertical pipe installed and the process starts again.

**Feature Measure:** Total capacity of basin

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 6,720.0

**Scenario Total Cost:** $34,215.36

**Scenario Cost/Unit:** $5.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 20 | $7,347.20 |
| 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 Yards | $487.76 | 50 | $24,388.00 |
| 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 Yards | $2.12 | 250 | $530.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 42 | $1,289.40 |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $4.45 | 36 | $160.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 632 - Waste Separation Facility

**Scenario:** #9 - Mechanical Separation Facility

**Scenario Description:**

A small mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One small mechanical separation facility (a vibratory or rotating screen) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

**Feature Measure:** Item

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $42,915.71

**Scenario Cost/Unit:** $42,915.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 10 | $3,673.60 |
| **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. | Hours | $31.49 | 16 | $503.84 |
| 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. | Hours | $24.46 | 32 | $782.72 |
| **Materials** | | | | | | |
| Vibratory or Rotating Screen | 1948 | Vibratory or Rotating Screen, includes materials, shipping and equipment. | Each | $36,911.00 | 1 | $36,911.00 |
| **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 | $69.11 | 3 | $207.33 |
| 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 | $168.33 | 2 | $336.66 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 634 - Waste Transfer

**Scenario:** #1 - Manure Auger

**Scenario Description:**

Scenario is for a manure auger associated with an agricultural production operation to transfer agricultural waste product from the storage facility to manure spreading equipment for proper utilization. This auger is used when the manure consistency will not allow for pumping. Payment includes the cost of the auger and labor for the electrical hook-up. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

In this typical setting, the operator has waste production from an animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

**After Situation:**

A typical installation would be for an auger to remove manure from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This auger is for a tank less than 14' deep and is part of an animal waste management system to address water quality concerns. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 632, Waste Separation Facility; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling

**Feature Measure:** Auger, installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,598.89

**Scenario Cost/Unit:** $7,598.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 12 | $377.88 |
| **Materials** | | | | | | |
| Manure Transfer, Auger or screw conveyor to transfer waste solids | 1773 | Auger or screw conveyor to transfer waste solids to a storage facility or manure spreading equipment. Includes shipping. | Each | $6,970.73 | 1 | $6,970.73 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #3 - Concrete Channel with Wall

**Scenario Description:**

Installation of a concrete channel that consists of a slab with a 2' wall on each side of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with a wall that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $18,336.02

**Scenario Cost/Unit:** $15.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 15 | $5,510.40 |
| 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 Yards | $487.76 | 22 | $10,730.72 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 8 | $432.32 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 26 | $605.02 |
| Safety gate, span manure transfer channel or chute | 1952 | Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4' tall with openings that will not pass a 6 inch or larger sphere. Includes materials only. | Feet | $14.62 | 12 | $175.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #4 - Concrete Channel with Curb

**Scenario Description:**

Installation of a concrete channel that consists of a slab with a 6” curb on each side of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with a curb each side that is 6” high for the entire length. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $9,242.66

**Scenario Cost/Unit:** $7.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 21 | $7,714.56 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 8 | $432.32 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 26 | $605.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #5 - Lot Runoff Containment Wall, >1ft Tall

**Scenario Description:**

Installation of a concrete wall with footing to direct manure laden lot runoff to a collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing manure laden lot runoff to discharge from the feedlot and cause water resources to be contaminated.

**After Situation:**

Typical installation consists of a 2' high concrete wall with an adjacent 5' wide, 5" thick concrete slab. Typical length is 300'. The purpose is to direct lot runoff to a collection basin or waste storage facility. Wall also allows manure to be scraped to waste storage facility. Associated practices may include: 313 Waste Storage Facility; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management; 633, Waste Recycling; 561, Heavy Use Protection Area.

**Feature Measure:** Length of Wall installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $21,083.89

**Scenario Cost/Unit:** $70.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 14 | $5,143.04 |
| 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 Yards | $487.76 | 30 | $14,632.80 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 31 | $721.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #6 - Concrete Channel with push-off wall at pond and safety gate

**Scenario Description:**

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel and push off wall to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The push-off ramp is a concrete cantilever structure that allows the waste to be moved into the storage facility. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $18,974.78

**Scenario Cost/Unit:** $15.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 22 | $8,081.92 |
| 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 Yards | $487.76 | 17 | $8,291.92 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 8 | $432.32 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 5 | $56.20 |
| **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. | Hours | $24.46 | 32 | $782.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 26 | $605.02 |
| Safety gate, span manure transfer channel or chute | 1952 | Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4' tall with openings that will not pass a 6 inch or larger sphere. Includes materials only. | Feet | $14.62 | 16 | $233.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #7 - Concrete Channel with Drop Chute

**Scenario Description:**

Installation of a concrete channel that consists of a slab with wall and footing on each side of the slab for the entire length of the channel, in addition to an overfall structure at the channel outlet, to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12'-wide x 12'-long push-off platform having an 8"-thick slab and 4'-high side walls. Push-off platform slab is supported on all four sides by a 6'-high wall with footer. A horizontal concrete beam is installed above the end of the platform to serve as a safety barrier for scraping equipment. Manure scraped off the end of the platform drops vertically onto a 16'-wide x 6"-thick concrete chute installed on the lower half of a 2:1 sideslope of a manure holding pond. The purpose is to transfer manure and runoff from a feedlot area or livestock building to a waste storage facility.

**Feature Measure:** Channel with Drop Chute, installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $12,261.52

**Scenario Cost/Unit:** $12,261.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 13.7 | $5,032.83 |
| 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 Yards | $487.76 | 9.9 | $4,828.82 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 8 | $486.88 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 5 | $56.20 |
| **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. | Hours | $24.46 | 32 | $782.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 19 | $583.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #8 - Manure Flush System

**Scenario Description:**

Installation of a manure flush system consisting of a flushwater storage tank, flushing mechanism such as a valve, and flush water distribution. This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. Payment includes tank, valve and distribution pipeline, site prep and concrete to support these structures. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

**Before Situation:**

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and collect the waste materials deposited.

**After Situation:**

The design flush volume for the flush system is less than 1000 gallons. Concrete slab to support the tank and distribution pipeline is 28ft x 12 ft x 5" thick. with 40 ft of above ground 8" pipe is used for distribution. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Feature Measure:** Gallons of water used per flush

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $5,854.57

**Scenario Cost/Unit:** $5.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 5 | $1,836.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 8 | $250.32 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 4 | $44.96 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $9.90 | 40 | $396.00 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $0.83 | 1000 | $830.00 |
| Plug Valve, 8 in. | 2101 | 8 inch diameter plug valve. Materials only. | Each | $1,653.09 | 1 | $1,653.09 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #9 - Wastewater Recycle System for Flush System, Pipes only

**Scenario Description:**

Installation of a wastewater recycle pipeline utilied with manure and wastewater flush system using recycled wastewater. Scenario is for the pipe system only to retrofit flush systems to utilize recycled water. Payment includes excavation, placement of bedding as needed, connveyance pipelines with valves and pipe backfill to transport water to the flush tank. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

**Before Situation:**

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.

**After Situation:**

Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete production surfaces. The pipe design for the flush volume requires 300 feet of 3 inch diameter pipe for pressure flow. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Feature Measure:** Flush - pipes

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $2,534.87

**Scenario Cost/Unit:** $8.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.27 | 300 | $381.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 12 | $375.48 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 12 | $302.64 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 11 | $322.74 |
| Pipe, PVC, 3 in., SCH 40 | 977 | Materials: - 3 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.63 | 300 | $789.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 634 - Waste Transfer

**Scenario:** #10 - Gravity or Low Pressure Flow Pipeline, Small

**Scenario Description:**

Gravity or low pressure flow pipeline used to transfer manure or wastewater according to the CNMP. Payment includes the pipe plus clean-out risers and fittings, trench excavation and backfill, labor and equipment for installation. Typical installation applies to soils with no special bedding requirements. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

**Before Situation:**

There is a need to transport manure or wastewater within a waste management system.

**After Situation:**

Install a 100 foot long 8 inch diameter PVC gasket IPS pipe to transfer the manure wastewater. The transfer pipeline will deliver the manure slurry according to the CNMP, thereby protecting water quality resources. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling; 635, Vegetated Treatment Area.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,698.44

**Scenario Cost/Unit:** $16.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 8 | $44.08 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 100 | $263.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $8.00 | 125 | $1,000.00 |

**Practice:** 634 - Waste Transfer

**Scenario:** #11 - Gravity or Low Pressure Flow Pipeline, Large

**Scenario Description:**

Gravity or low pressure flow pipeline used to transfer manure or wastewater according to the CNMP. Payment includes the pipe plus clean-out risers and fittings, trench excavation and backfill, gravel bedding, labor and equipment for installation. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

**Before Situation:**

There is a need to transport manure or wastewater within a waste management system.

**After Situation:**

Install a 100 foot long 24 inch diameter dual wall gasket IPS pipe to transfer the manure wastewater. The transfer pipeline will deliver the manure slurry according to the CNMP, thereby protecting water quality resources. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling; 635, Vegetated Treatment Area.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,827.92

**Scenario Cost/Unit:** $38.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $128.05 | 8 | $1,024.40 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 72 | $2,210.40 |

**Practice:** 634 - Waste Transfer

**Scenario:** #12 - Pressurized Pipeline

**Scenario Description:**

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP. The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers. Payment includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

**Before Situation:**

There is a need to transport manure or wastewater within a waste management system. The pressure distribution pipeline is utilized in the land application aspect of the operation.

**After Situation:**

Install a 2000 foot long 8 inch diameter PVC gasket IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $35,212.76

**Scenario Cost/Unit:** $17.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 4 | $729.68 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $5.51 | 180 | $991.80 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $2.63 | 2000 | $5,260.00 |
| **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. | Hours | $24.46 | 80 | $1,956.80 |
| 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. | Hours | $41.94 | 20 | $838.80 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 26 | 991 | Materials: - 8 inch - PVC - SDR 26 160 psi - ASTM D2241 | Feet | $10.46 | 2000 | $20,920.00 |
| Valve, Pressure Relief | 1042 | Materials for <2 inch Pressure Relief Valve | Each | $140.60 | 1 | $140.60 |
| Valve, Air Vacuum Release, Continuous | 1106 | Materials for <2 inch Automatic Air/Vacuum Relief Valve (3 - Way Air Vac) | Each | $173.59 | 3 | $520.77 |
| Plug Valve, 8 in. | 2101 | 8 inch diameter plug valve. Materials only. | Each | $1,653.09 | 1 | $1,653.09 |
| Valve, sprinkler hydrant irrigation valve with riser, metal, 8 x 4 x 42 inch | 2104 | Irrigation hydrant valve assembly including saddle tee, coated metal riser and integral valve installed on a 8 inch dia. pipeline, 4 inch dia. X 42 inch long riser. Materials only. | Each | $314.46 | 7 | $2,201.22 |

**Practice:** 634 - Waste Transfer

**Scenario:** #38 - Cased Pipeline with Boring

**Scenario Description:**
Installation of a 6" plastic pipeline with an outer casing, bored under a road or other obstruction to convey wastewater from a storage structure to points of use.

**Before Situation:**
Waste material needs to be transported across a road from the storage facility.

**After Situation:**
The typical installation consists of installing 120 ft of 6" PVC SDR 21 pipe with a 10" outer casing under a roadbed. Pipeline boring includes all pipe under roadbed and labor and equipment involved during installation of pipe. The pipeline is installed as a facilitating practice for utilization of waste in a waste management system, to improve water quality. Payment incorporates couplers and fittings. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices include Waste Storage Facility (313), Pumping Plant (533).

**Feature Measure:** foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 120.0

**Scenario Total Cost:** $16,864.68

**Scenario Cost/Unit:** $140.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 12 | $375.48 |
| Horizontal Boring, Greater Than 3 in. diameter | 1132 | Includes equipment, labor and setup. | Feet | $102.08 | 120 | $12,249.60 |
| **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. | Hours | $24.46 | 32 | $782.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 12 | $360.72 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 21 | 987 | Materials: - 6 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $7.58 | 120 | $909.60 |
| Pipe, PVC, 10 in., SCH 40 | 1713 | Materials: - 10 inch -PVC - SCH 40 - ASTM D1785 | Feet | $14.05 | 120 | $1,686.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 634 - Waste Transfer

**Scenario:** #39 - Lot Runoff Containment Wall, <=1ft tall

**Scenario Description:**

Installation of a concrete wall with footing to direct manure laden lot runoff to a collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing manure laden lot runoff to discharge from the feedlot and cause water resources to be contaminated.

**After Situation:**

Typical installation consists of a 9" high concrete wall with an adjacent 5' wide, 5" thick concrete slab. Typical length is 300'. The purpose is to direct lot runoff to a collection basin or waste storage facility. Wall also allows manure to be scraped to waste storage facility. Associated practices may include: 313 Waste Storage Facility; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management; 633, Waste Recycling; 561, Heavy Use Protection Area.

**Feature Measure:** Length of wall installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $17,669.57

**Scenario Cost/Unit:** $58.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 14 | $5,143.04 |
| 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 Yards | $487.76 | 23 | $11,218.48 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 31 | $721.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 634 - Waste Transfer

**Scenario:** #51 - Wastewater catch basin, less than or equal to 1000 gal.

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

**After Situation:**

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $8,092.68

**Scenario Cost/Unit:** $8.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 4 | $1,469.44 |
| 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 Yards | $487.76 | 2 | $975.52 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 8 | $250.32 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 4 | $199.12 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 2 | $22.48 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 5 | $116.35 |
| Catch Basin, concrete, 60 in dia. | 1754 | Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only. | Each | $2,305.75 | 1 | $2,305.75 |
| **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 | $168.33 | 2 | $336.66 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 634 - Waste Transfer

**Scenario:** #52 - Wastewater reception pit, 1000 to 5000 gal.

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume between 1000 and 5000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

**After Situation:**

This practice scenario is suitable where the estimated design volume for waste collection and transfer is between 1000 and 5000 gallons of liquid waste. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 4,300.0

**Scenario Total Cost:** $15,569.06

**Scenario Cost/Unit:** $3.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 6 | $2,204.16 |
| 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 Yards | $487.76 | 14 | $6,828.64 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 24 | $750.96 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 8 | $432.32 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 8 | $398.24 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 3 | $33.72 |
| **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. | Hours | $24.46 | 64 | $1,565.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 16 | $403.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| 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. | Hours | $41.94 | 24 | $1,006.56 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 12 | $279.24 |
| Safety chain tractor barrier | 1725 | 3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $2.69 | 40 | $107.60 |
| **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 | $168.33 | 2 | $336.66 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 634 - Waste Transfer

**Scenario:** #53 - Wastewater basin, 5000 gal. and larger

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume greater than 5000 gallons such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this pit is intended to be transferred to final storage within a 48 hour period. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

**After Situation:**

This practice scenario is suitable where the estimated maximum design volume for wastewater collected is greater than 5000 gallons of liquid waste within 48 hours or before it is stored or treated. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters inlet area to collect liquid slurry waste and the installation of an 12 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 8,600.0

**Scenario Total Cost:** $23,913.03

**Scenario Cost/Unit:** $2.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $367.36 | 11 | $4,040.96 |
| 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 Yards | $487.76 | 22 | $10,730.72 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $31.29 | 32 | $1,001.28 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 12 | $648.48 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 16 | $796.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $11.24 | 4 | $44.96 |
| **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. | Hours | $24.46 | 80 | $1,956.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 28 | $706.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 32 | $961.92 |
| 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. | Hours | $41.94 | 40 | $1,677.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 15 | $349.05 |
| Safety chain tractor barrier | 1725 | 3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $2.69 | 60 | $161.40 |
| **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 | $168.33 | 2 | $336.66 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario:** #1 - VTA-Constructed Vegetative Area with Flow Distribution

**Scenario Description:**

This is a permanent herbaceous vegetative area installed near livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow or is pumped into distributionn piping within the the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from or directly discharging from an animal operation that has the potential to pollute surface waters or pond and leaching into groundwater.

**After Situation:**

Typical VTA is 1.0 ac in size, includes a gravel trench for distribution flow (sheet flow) into the VTA. Typically requires grading and shaping, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) . For milkhouse waste, Waste Treatment (629) ond/or Waste Storage Facility (313) could be contracted to provide pre-treatment/ storage prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA installed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,868.84

**Scenario Cost/Unit:** $6,868.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 400 | $520.00 |
| 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 Yards | $2.12 | 70 | $148.40 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 16 | $864.64 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 16 | $480.96 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 70 | $2,149.00 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.26 | 45 | $56.70 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.57 | 15 | $8.55 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE- 160 psi - ASTM D3035 DR 9 | Feet | $22.90 | 80 | $1,832.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario:** #2 - VTA-Constructed with Mechanical distribution

**Scenario Description:**

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 1.0 ac in size, includes the sizing, grading and shaping of the VTA area. Typically requires grading and shaping to maintain sheet flow onto the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA mechanical distribution component that is contracted using Irrigation System, Sprinkler (442). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA installed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,987.24

**Scenario Cost/Unit:** $1,987.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 16 | $864.64 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 16 | $480.96 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario:** #3 - VTA using an Existing Vegetative Area with Flow Distribution

**Scenario Description:**

An existing permanent herbaceous vegetated area that meets the requirements for a VTA and is used as an overland flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 1.0 ac in size, includes a gravel trenchs and perforated pipe to establish sheet flow into the VTA where and existing permanent herbaceouse vegetated area meets the requirements for a VTA. Does not include any grading or seeding. The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA treating wastewate

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,516.87

**Scenario Cost/Unit:** $9,516.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $487.76 | 7 | $3,414.32 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.30 | 445 | $578.50 |
| 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 Yards | $2.12 | 75 | $159.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 75 | $2,302.50 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.26 | 40 | $50.40 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.57 | 20 | $11.40 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE- 160 psi - ASTM D3035 DR 9 | Feet | $22.90 | 100 | $2,290.00 |
| **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 | $69.11 | 1 | $69.11 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario:** #1 - Base

**Scenario Description:**

Typical scenario for the construction of an earthen embankment or the rebuild of an existing WASCOB. Rebuild work includes the removal of accumulated sediment from the pool area to restore original capacity. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed/rebuilt across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices.

**Before Situation:**

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concerns addressed include soil erosion and water quality by trapping sediment and/or reducing erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basin is constructed or rebuilt by the excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** CY of WASCOB Embankment

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 700.0

**Scenario Total Cost:** $1,811.22

**Scenario Cost/Unit:** $2.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.17 | 700 | $1,519.00 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario:** #2 - Topsoil

**Scenario Description:**

Typical scenarios for the construction of an earthen embankment or the rebuild of an existing WASCOB. Prior to constructing/reconstructing the embankment, 6 inches of topsoil is removed and stockpiled. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed/rebuilt across the slope and minor watercourses to form a sediment trap and water detention basin. Topsoil is replaced following construction of the embankment. Costs include all equipment necessary to strip and stock pile topsoil, excavate, shape, grade and compact the Water and Sediment Control Basin, spread and replace topsoil after construction and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Work is done with dozer, scraper, or road grader.

**Before Situation:**

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) is being transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basis is constructed or rebuilt by the excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** CY of WASCOB Embankment

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 700.0

**Scenario Total Cost:** $2,033.72

**Scenario Cost/Unit:** $2.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 250 | $222.50 |
| 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 Yards | $2.17 | 700 | $1,519.00 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario:** #5 - Base, crop seasonal construction

**Scenario Description:**

Typical scenario for the construction of an earthen embankment or the rebuild of an existing WASCOB. Rebuild work includes the removal of accumulated sediment from the pool area to restore original capacity. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed/rebuilt across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Foregone income reflects entire construction area to account for crop loss while constructing during the growing season.

**Before Situation:**

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concerns addressed include soil erosion and water quality by trapping sediment and/or reducing erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basin is constructed or rebuilt by the excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** CY of WASCOB Embankment

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 700.0

**Scenario Total Cost:** $2,135.05

**Scenario Cost/Unit:** $3.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.17 | 700 | $1,519.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario:** #6 - Topsoil, crop seasonal construction

**Scenario Description:**

Typical scenarios for the construction of an earthen embankment or the rebuild of an existing WASCOB. Prior to constructing/reconstructing the embankment, 6 inches of topsoil is removed and stockpiled. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed/rebuilt across the slope and minor watercourses to form a sediment trap and water detention basin. Topsoil is replaced following construction of the embankment. Costs include all equipment necessary to strip and stock pile topsoil, excavate, shape, grade and compact the Water and Sediment Control Basin, spread and replace topsoil after construction and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Work is done with dozer, scraper, or road grader. Foregone income reflects entire construction area to account for crop loss while constructing during the growing season.

**Before Situation:**

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) is being transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basis is constructed or rebuilt by the excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** CY of WASCOB Embankment

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 700.0

**Scenario Total Cost:** $2,357.55

**Scenario Cost/Unit:** $3.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 250 | $222.50 |
| 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 Yards | $2.17 | 700 | $1,519.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.5 | $161.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.5 | $162.78 |
| **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. | Hours | $41.94 | 1 | $41.94 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 642 - Water Well

**Scenario:** #1 - Large Diameter Drilled Well

**Scenario Description:**

Typical construction is for the drilling of a well using a bucket well drill rig. These wells are large diameter drilled wells. The purpose of the practice is to provide water for livestock. An average well depth is less than 100 foot at 36" diameter. These wells are typically implemented in glacial till areas where the ground water resource has slow recharge rate, and the large diameter of the well allows for storage of water to meet the demand.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source.

**After Situation:**

A 48 ft., 36" diameter well is installed using a bucket drill rig. The large diameter of the well allows for storage of water in glacial till areas where the groundwater recharge rate is less than demand. The well is dug and then cased with concrete. Perforated concrete casing is used as a screen around the bottom of the well. Approximately 6" of gravel is placed around the screen. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** Depth of Well

**Scenario Unit:** Feet

**Scenario Typical Size:** 48.0

**Scenario Total Cost:** $10,870.29

**Scenario Cost/Unit:** $226.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $331.12 | 16 | $5,297.92 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 16 | $480.96 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 4 | $122.80 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 5 | $21.85 |
| Well Casing, Concrete | 2173 | Concrete tile 3 feet diameter x 8 feet long. Materials only. | Feet | $92.23 | 40 | $3,689.20 |
| Well Casing, Concrete, perforated | 2174 | Perforated concrete tile 3 feet diameter x 8 feet long. Materials only. | Feet | $101.45 | 8 | $811.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 642 - Water Well

**Scenario:** #2 - Shallow Drilled Well, <= 100 feet, <= 6in Dia.

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface, and the flow is such that a smaller diameter well is sufficient. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source.

**After Situation:**

An average well depth is 100 feet. Well casings are ≤ 6" in diameter. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** Depth of Well

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,294.89

**Scenario Cost/Unit:** $52.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $331.12 | 10 | $3,311.20 |
| **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 Yards | $479.47 | 1 | $479.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 1 | $4.37 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $38.27 | 1 | $38.27 |
| Well Casing, Plastic, 6 in. | 1804 | PVC or ABS non-threaded well casing, 6 inch. Materials only. | Feet | $9.53 | 70 | $667.10 |
| Well Screen, plastic, 6 in. | 1999 | 6 inch PVC well screen. Materials only. | Feet | $18.14 | 30 | $544.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 642 - Water Well

**Scenario:** #3 - Shallow Drilled Well, <= 100 feet, > 6in Dia.

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface, and the flow is such that a largerr diameter well is needed. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source.

**After Situation:**

An average well depth is 100 feet. Well casings are 12" in diameter. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** Depth of Well

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $6,777.10

**Scenario Cost/Unit:** $67.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $331.12 | 10 | $3,311.20 |
| **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 Yards | $479.47 | 1 | $479.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 1 | $4.37 |
| Well Cap, 12 in. | 1789 | Well cap, 12 inch. Materials only. | Each | $105.88 | 1 | $105.88 |
| Well Casing, Plastic, 12 in. | 1807 | PVC or ABS non-threaded well casing, 12 inch. Materials only. | Feet | $26.22 | 70 | $1,835.40 |
| Well Screen, plastic, 8 in. | 2000 | 8 inch PVC well screen. Materials only. | Feet | $26.35 | 30 | $790.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 642 - Water Well

**Scenario:** #4 - Deep Drilled Well, > 100 Feet

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur >100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source.

**After Situation:**

An average well depth is 300 feet. Well casings are 4-6" in diameter. Well is dug into consolidated (bedrock or firm material) where casing and lining is installed to a depth of 240 feet. The remaining depth does not need lining or screening due to the "open hole" construction and nature of wells in this substrate. Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** Depth of Well

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $8,580.11

**Scenario Cost/Unit:** $28.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $331.12 | 16 | $5,297.92 |
| **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 Yards | $479.47 | 1 | $479.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $4.37 | 1 | $4.37 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $38.27 | 1 | $38.27 |
| Well Casing, Plastic, 6 in. | 1804 | PVC or ABS non-threaded well casing, 6 inch. Materials only. | Feet | $9.53 | 220 | $2,096.60 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $20.66 | 20 | $413.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #2 - Habitat Monitoring and Management, Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where native plant conditions (T&E plants) or wildlife have been identified as the resource concern, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

**Before Situation:**

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

**After Situation:**

Rare and declining habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $648.82

**Scenario Cost/Unit:** $4.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 1 | $7.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.5 | $35.51 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 7 | $171.22 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #3 - Rare or Declining Habitat Monitoring and Management, Medium Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified related to rare or declining habitats, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

**Before Situation:**

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

**After Situation:**

Rare or declining habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $2,046.92

**Scenario Cost/Unit:** $12.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 4 | $28.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 5 | $246.85 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #4 - Habitat Monitoring and Management, High Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $1,925.74

**Scenario Cost/Unit:** $24.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 8 | $56.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

**Scenario Description:**

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

**After Situation:**

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** hours of tractor use

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $767.40

**Scenario Cost/Unit:** $38.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 20 | $317.40 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 6 | $298.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 6 | $151.32 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

**Scenario Description:**

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

**After Situation:**

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** Hours

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,250.31

**Scenario Cost/Unit:** $112.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 6 | $1,214.58 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 20 | $317.40 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #26 - Savanna or Prairie Restoration, Heavy

**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 savannas or prairies where the Ecological Site Description indicates a savanna or prairie. Scenario is for savanna or prairie restoration where greater than 60% canopy cover across the treatment area is in undesirable non-herbaceous cover. Payment is based on impacted acres only. This scenario is intended to restore and manage the ecological site for associated wildlife species that benefit from habitats such as savannas or prairies Associated practices may include, but are not limited to; Early Successional Habitat Management/Development (647), Prescribed Burning (338) 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 control is needed to manage for associated wildlife species that benefit from habitats such as savannas and prairies.

**After Situation:**

Savanna or prairie is restored and flora and fauna that depend on that habitat flourish.

**Feature Measure:** treated acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,287.86

**Scenario Cost/Unit:** $328.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 8 | $56.00 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 24 | $1,184.88 |
| 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. | Hours | $70.17 | 2.5 | $175.43 |
| **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. | Hours | $31.49 | 55 | $1,731.95 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 5 | $139.60 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #27 - Savanna or Prairie Restoration, Medium

**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 savannas or prairies where the Ecological Site Description indicates a savanna or prairie. Scenario is for savanna or prairie restoration where 40% - 60% canopy cover across the treatment area is in undesirable non-herbaceous cover. Payment is based on impacted acres only. This scenario is intended to restore and manage the ecological site for associated wildlife species that benefit from habitats such as savannas or prairies Associated practices may include, but are not limited to; Early Successional Habitat Management/Development (647), Prescribed Burning (338) 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 control is needed to manage for associated wildlife species that benefit from habitats such as savannas and prairies.

**After Situation:**

Savanna or prairie is restored and flora and fauna that depend on that habitat flourish

**Feature Measure:** acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,014.67

**Scenario Cost/Unit:** $201.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 4 | $28.00 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 16 | $789.92 |
| 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. | Hours | $70.17 | 2.5 | $175.43 |
| **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. | Hours | $31.49 | 28 | $881.72 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 5 | $139.60 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #28 - Savanna or Prairie Restoration, Light

**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 savannas or prairies where the Ecological Site Description indicates a savanna or prairie. Scenario is for savanna or prairie restoration where 10% - 39% canopy cover across the treatment area is in undesirable non-herbaceous cover. Payment is based on impacted acres only. This scenario is intended to restore and manage the ecological site for associated wildlife species that benefit from habitats such as savannas or prairies Associated practices may include, but are not limited to; Early Successional Habitat Management/Development (647), Prescribed Burning (338) 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 control is needed to manage for associated wildlife species that benefit from habitats such as savannas and prairies.

**After Situation:**

Savanna or prairie is restored and flora and fauna that depend on that habitat flourish.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $813.80

**Scenario Cost/Unit:** $81.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 5 | $246.85 |
| 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. | Hours | $70.17 | 2.5 | $175.43 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 5 | $139.60 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #29 - Woodland Restoration, Heavy

**Scenario Description:**

Removing or reducing the tree canopy and utilizing chemical treatment (except for non-sprouting woody species) to promote herbaceous growth or early woody succession to benefit wildlife habitat where the Ecological Site Description indicates a woodland. Scenario is for open woodland restoration where basal area removal is >40 square feet per acre, or >400 stems per acre. This scenario is intended to restore and manage the ecological site for associated wildlife species that benefit from habitats such as open woodlands by felling the majority of the undesirable trees to allow installation of associated practices. Associated practices may include, but are not limited to; Early Successional Habitat Management/Development (647), Prescribed Burning (338) and Conservation Cover (327).

**Before Situation:**

A stand of trees is even aged and lacks structural diversity. 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 open woodlands.

**After Situation:**

The ecological site is restored and flora and fauna that depend on open woodland habitat flourish

**Feature Measure:** Treatment area

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,474.50

**Scenario Cost/Unit:** $247.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 30 | $210.00 |
| 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. | Hours | $70.17 | 5 | $350.85 |
| **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. | Hours | $31.49 | 55 | $1,731.95 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 10 | $181.70 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #30 - Woodland Restoration, Medium

**Scenario Description:**

Removing or reducing the tree canopy and utilizing chemical treatment (except for non-sprouting woody species) to promote herbaceous growth or early woody succession to benefit wildlife habitat where the Ecological Site Description indicates a woodland. Scenario is for open woodland restoration where basal area removal is 30 - 40 square feet per acre, or 200 - 400 stems per acre. This scenario is intended to restore and manage the ecological site for associated wildlife species that benefit from habitats such as open woodlands by felling the majority of the undesirable trees to allow installation of associated practices. Associated practices may include, but are not limited to; Early Successional Habitat Management/Development (647), Prescribed Burning (338) and Conservation Cover (327).

**Before Situation:**

A stand of trees is even aged and lacks structural diversity. 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 open woodlands.

**After Situation:**

The woodland ecological site is restored and flora and fauna that depend on open woodland habitat flourish.

**Feature Measure:** Area Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,932.15

**Scenario Cost/Unit:** $193.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 20 | $140.00 |
| 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. | Hours | $70.17 | 5 | $350.85 |
| **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. | Hours | $31.49 | 40 | $1,259.60 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 10 | $181.70 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario:** #31 - Woodland Restoration, Light

**Scenario Description:**

Removing or reducing the tree canopy and utilizing chemical treatment (except for non-sprouting woody species) to promote herbaceous growth or early woody succession to benefit wildlife habitat where the Ecological Site Description indicates a woodland. Scenario is for open woodland restoration where basal area removal is 20 - 29 square feet per acre, or 100 - 199 stems per acre. This scenario is intended to restore and manage the ecological site for associated wildlife species that benefit from habitats such as open woodlands by felling the majority of the undesirable trees to allow installation of associated practices. Associated practices may include, but are not limited to; Early Successional Habitat Management/Development (647), Prescribed Burning (338) and Conservation Cover (327).

**Before Situation:**

A stand of trees is even aged and lacks structural diversity. 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 open woodlands.

**After Situation:**

The woodland ecological site is restored and flora and fauna that depend on open woodland habitat flourish.

**Feature Measure:** Area Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,582.25

**Scenario Cost/Unit:** $158.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 15 | $105.00 |
| 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. | Hours | $70.17 | 5 | $350.85 |
| **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. | Hours | $31.49 | 30 | $944.70 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 10 | $181.70 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #2 - Wetland Wildlife Habitat Monitoring and Management, Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to wetlands on landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

**Before Situation:**

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

**After Situation:**

Widlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $648.82

**Scenario Cost/Unit:** $4.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 1 | $7.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.5 | $35.51 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 7 | $171.22 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #3 - Habitat Monitoring and Management, Medium Intensity and Complexity

**Scenario Description:**

This scenario is applied to wetland areas located on all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

**Before Situation:**

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

**After Situation:**

Wetland wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $2,046.92

**Scenario Cost/Unit:** $12.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 4 | $28.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 5 | $246.85 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #4 - Habitat Monitoring and Management, High Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

**Before Situation:**

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

**After Situation:**

Wetland wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $2,474.22

**Scenario Cost/Unit:** $30.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 4 | $428.24 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 8 | $56.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

**Scenario Description:**

This typical scenario is installed on non-forested wetlands, including openlands prior to tree planting. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

**After Situation:**

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** hours of tractor use

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $767.40

**Scenario Cost/Unit:** $38.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 20 | $317.40 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 6 | $298.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 6 | $151.32 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

**Scenario Description:**

This typical scenario is installed on non-forested wetlands (or open land prior to tree planting), where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

**After Situation:**

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** Hours

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,250.31

**Scenario Cost/Unit:** $112.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 6 | $1,214.58 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 20 | $317.40 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #7 - Topographic Feature Creation, Low

**Scenario Description:**

The setting is all landuses, but typically is on lands used for the production of forest products grazing and/or fish and wildlife where the slope gradient is less than two percent and soils that are not excessively drained. The State-approved habitat evaluation or appraisal found that a limiting factor for wetland wildlife is the absence of sufficient variability in microtopograpic relief in the area. The construction of topographic features will provide for diverse soil hydrologic conditions needed to treat the degraded plant condition and/or inadequate habitat for wetland wildlife. Excavated spoil is spread adjacent to excavation or moved to designated locations but not compacted. This scenario is for earthwork, not associated with habitat structures or any other national standard (e.g. Wetland Restoration (657), Wetland Enhancement (659), Wetland Creation (658), and Dike (356)). Facilitating practices may include Structure for Water Control (587).

**Before Situation:**

The site lacks sufficient micro- and macrotopographic features needed for optimal wetland wildlife habitat for target species. Typically the site has been previously manipulated and utilized for agricultural, livestock or forest production. With the loss of hummocks, depressions and other topographic features scattered throughout the site, both plant and animal species that are dependent on the microenvironments created by these features are no longer present or are in decline within the planning unit.

**After Situation:**

As a result of the installation, the topograpic releif needed to provide the varied wetland wildlife habitat needs is provided.

**Feature Measure:** Acres of constructed features

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,928.49

**Scenario Cost/Unit:** $792.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 56 | $5,747.28 |
| Satellite imagery, aerial photography, infrared | 966 | Infrared imagery | Acres | $0.20 | 100 | $20.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 56 | $1,683.36 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #8 - Topographic Feature Creation, High

**Scenario Description:**

The setting is all landuses, but typically is on lands used for the production of forest products grazing and/or fish and wildlife where the slope gradient is less than two percent and soils that are not excessively drained. The State-approved habitat evaluation or appraisal found that a limiting factor for wetland wildlife is the absence of sufficient variability in microtopograpic relief in the area. The construction of topographic features will provide for diverse soil hydrologic conditions needed to treat the degraded plant condition and/or inadequate habitat for wetland wildlife. Excavated spoil is needed to further enhance macrotopograpic relief by placing and compacting the fill in strategic areas. This scenario is for earthwork, not associated with habitat structures or any other national standard (e.g. Wetland Restoration (657), Wetland Enhancement (659), Wetland Creation (658), and Dike (356)). Facilitating practices may include Structure for Water Control (587).

**Before Situation:**

The site lacks sufficient micro- and macrotopographic features needed for optimal wetland wildlife habitat for target species. Typically the site has been previously manipulated and utilized for agricultural, livestock or forest production. With the loss of hummocks, depressions and other topographic features scattered throughout the site, both plant and animal species that are dependent on the microenvironments created by these features are no longer present or are in decline within the planning unit.

**After Situation:**

As a result of the installation, the topograpic relief needed to provide the varied wetland wildlife habitat needs is provided.

**Feature Measure:** Acres of constructed features

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $17,108.99

**Scenario Cost/Unit:** $1,710.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.27 | 2150 | $9,180.50 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 56 | $5,747.28 |
| Satellite imagery, aerial photography, infrared | 966 | Infrared imagery | Acres | $0.20 | 100 | $20.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 56 | $1,683.36 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #9 - Management and monitoring only, foregone income

**Scenario Description:**

Site management will include managing/monitoring the site to provide food and cover for wetland wildlife species on cropland. Annual vegetation (crops or other annual vegetation) will be allowed to establish and persist during critical nesting and brood rearing seasons and will remain standing (not harvested) until migratory species have left the site. The setting is on lands used for the production of crops where the slope gradient is less than two percent and soils that are not excessively drained. The State-approved habitat evaluation or appraisal found that a limiting factor for wetland wildlife is the absence of sufficient cover and food in the area. The manipulation of existing cover will be accomplished thru mechanical methods to provide a diverse vegetation mosaic with in and adjacent to the existing wetland addressing inadequate habitat for wetland wildlife. Where this occurs on cropped fields, annual crops will be lost for one growing season (foregone income is included).

**Before Situation:**

The site lacks sufficient and diverse cover and food needed for optimal wetland wildlife habitat or target species. Typically the site has been previously manipulated and utilized for agricultural. With the loss of abundant and diverse cover and food throughout the site, both plant and animal species that are dependent on these elements are no longer present or are in decline within the planning unit.

**After Situation:**

Agricultural crop or annual vegetation has been allowed to persist providing needed food and cover essential for identified species. Crops and annual vegetation will not be harvested during the critical seasons as identified by the habitat evaluation. As a result of the installation, adequate habitat needs have been provided.

**Feature Measure:** Acres of Wetland Wildlife Cover an

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,396.95

**Scenario Cost/Unit:** $339.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 10 | $158.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #10 - Management and Monitoring on Idled Cropland for Wetland Wildlife, foregone income - Level 1 (Year 2-5)

**Scenario Description:**

This scenario addresses wildlife habitat management for wetter or more water saturated portions of cropland fields which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. The cession of cropping and maintenance of hydrology will provide adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Where this occurs on cropped fields, annual crops will be lost for one growing season (foregone income is included).

**Before Situation:**

Setting is any prairie pothole. The wetlands must be wholly or partially in cropland. These wetlands are currently cropped, and hydrology has or could be diverted from the wetland by way of tiling, field or road ditching, diking or any other feature that removes wetland hydrology. These wetter or more water saturated portions of cropland fields have the potential to produce a significant amount of moist soil plants which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. The current system provides little to no wildlife habitat with habitat limiting factors such as quality, quantity and continuity of forage, cover, shelter and space being identified. Drainage could also result in inadequate wildlife water and inadequate habitat.

**After Situation:**

The planning unit is adequately covered with permanent and/or annual (non-persistent) vegetation. The cession of cropping and maintenance of hydrology provides adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Monitoring assures hydrology is intact and provides wildlife water and habitat. Acres will be assessed and score 0.5 or greater as both Wetlands and Cropland on the Wildlife Habitat Evaluation Guide. Monitoring will be used to determine if the hydrology remains intact and cover is adequate and free of invasive weed species. Examples of monitoring include but are not limited to: photo points with comparisons to surrounding wetlands, use documentation by livestock, regeneration or breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments.

**Feature Measure:** Area idled from crop production to

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $754.66

**Scenario Cost/Unit:** $377.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1 | $322.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1 | $325.56 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #11 - Idling Cropland for Wetland Wildlife - Level 2

**Scenario Description:**

This scenario addresses wildlife habitat management for wetter or more water saturated portions of cropland fields which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. The cession of cropping and maintenance of hydrology will provide adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Where this occurs on cropped fields, annual crops will be lost for one growing season (foregone income is included).

**Before Situation:**

Setting is any wetland being 2 acres or less on the National Wetland Inventory with fully intact hydrology. The wetlands must be wholly or partially in cropland. These wetlands are currently cropped, and hydrology could be diverted from the wetland by way of tiling, field or road ditching, diking or any other feature that removes wetland hydrology. These wetter or more water saturated portions of cropland fields have the potential to produce a significant amount of moist soil plants which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. The current system provides little to no wildlife habitat with habitat limiting factors such as quality, quantity and continuity of forage, cover, shelter and space being identified. Drainage could also result in inadequate wildlife water and inadequate habitat.

**After Situation:**

The planning unit is adequately covered with annual (non-persistent) vegetation. The cession of cropping and maintenance of hydrology provides adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Monitoring assures hydrology is intact and provides wildlife water and habitat. Acres will be assessed and score 0.5 or greater as both Wetlands and Cropland on the Wildlife Habitat Evaluation Guide. Monitoring will be used to determine if the hydrology remains intact and cover is adequate and free of invasive weed species. Examples of monitoring include but are not limited to: photo points with comparisons to surrounding wetlands, use documentation by livestock, regeneration or breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments.

**Feature Measure:** Area idled from crop production to

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $765.06

**Scenario Cost/Unit:** $382.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 2 | $20.80 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1 | $322.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1 | $325.56 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario:** #12 - Monitoring and Management - Level 3

**Scenario Description:**

This scenario applies to cropped wetlands, two acres or less in size identified on the National Wetland Inventory, with intact hydrology, currently cropped (typically in a corn-wheat-soybean rotation) and lacking adequate food and cover for migratory water fowl during critical periods. The inadequate wildlife habitat resource concern can be addressed by allowing EXISTING annual vegetation (crops or other annual vegetation) to establish and persist during critical nesting and brood rearing seasons. Annual crops may be lost for one growing season.

**Before Situation:**

Existing habitat is a cropped wetland, lacking wildlife food and cover during the cropping season. Normal seeding and/or harvest occurs about 30% of the time. Excess wetness during the early planting season in the remaining years often cause ag producers to seed these small areas after the initial seeding date resulting in soil compaction, reduced hydrology, and limited crop success. As these areas are intermingled with upland, managing as a separate land use is unfeasible. Monitoring (with supporting photo documentation) and a State-approved Wildlife Habitat Evaluation Guide confirms an inadequate wildlife habitat resource concern exists.

**After Situation:**

Agricultural crop or annual vegetation will be allowed to persist providing food and cover essential for migratory birds. Crops and annual vegetation will not be harvested during the primary nesting season as identified by the habitat evaluation guide. This allows for successful nesting and brood rearing. The Wildlife Habitat Evaluation Guide documents an increase in planning criteria (and at a minimum meet planning criteria) for the inadequate wildlife habitat resource concern. Monitoring (with supporting photo documentation) demonstrates wildlife habitat has been improved to levels consistent with management goals/objectives, as well as observed use of the wetland habitat by wildlife.

**Feature Measure:** NWI for sizing

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $549.97

**Scenario Cost/Unit:** $274.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.7 | $225.46 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.7 | $227.89 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #1 - Macro Topography, deep

**Scenario Description:**

Establishment of a topographic feature on the landscape consisting of a small dam and pool or small excavated depression that will hold water to provide a source of water for wildlife, including habitat for reptiles and amphibians. Payment includes the equipment and labor assocaited with establishing the water feature.

**Before Situation:**

This practice will be installed on any area where seasonal or permenent water for wildlife is inadequate. The resource concerns to be addressed by this practice are inadequate water needed to meet the life needs of the target species or guild. Water storage during the critical period (season) is absent. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking richness.

**After Situation:**

This practice consists of an excavated depresion to collect water for wildlife to access. Excavated depresions are typically 1000 ft2 and 3 feet deep in center with 4:1 side slopes around edge. Associated practices: Critical Area Planting (342), Conservation Cover (327)

**Feature Measure:** Each deep macro-topography featu

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $781.04

**Scenario Cost/Unit:** $781.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 4 | $410.52 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #3 - Habitat Monitoring and Management, Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

**After Situation:**

Widlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $648.82

**Scenario Cost/Unit:** $4.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 1 | $7.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1.5 | $35.51 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 7 | $171.22 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #4 - Habitat Monitoring and Management, Medium Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $2,046.92

**Scenario Cost/Unit:** $12.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 4 | $28.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 5 | $246.85 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #5 - Habitat Monitoring and Management, High Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $2,474.22

**Scenario Cost/Unit:** $30.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $107.06 | 4 | $428.24 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 8 | $56.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #6 - Wildlife Habitat Enhancement w/ FI

**Scenario Description:**

Exclusion of livestock on 40 acres of pastureland for the enhancement of habitat for wildlife. Monitoring to assure gates are closed and cattle remain exclused duirng critical nesting period.

**Before Situation:**

Wildlife habitat is grazed during the primary nesting and development of wildlife species.

**After Situation:**

Livestock are excluded for wildlife habitat enhancement for the desired wildlife species. Implementation includes the exclusion of livestock to allow for adequate deferment for sufficient regrowth and development of the habitat.

**Feature Measure:** Acres Excluded

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $851.48

**Scenario Cost/Unit:** $21.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 40 | $767.60 |
| **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. | Hours | $41.94 | 2 | $83.88 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #7 - Deferred Acres

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Rare and Declining and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is low in complexity and intensity. Examples of prescribed monitoring include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan. Includes foregone income. Setting is cropland that will be managed to benefit rare and declining habitats through deferral or seeding to permanent vegetation.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulted in low use of the area by target species. On dryland fields.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of habitat management efforts and prescribed monitoring has been implemented. Crop production has been halted to allow for implementation, management, and monitoring of wildlife habitat, resulting in income foregone. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate habitat conditions have been addressed. Monitoring has maximized the benefits of the needed habitat treatment efforts.

**Feature Measure:** Acres Managed and Monitored

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $1,703.01

**Scenario Cost/Unit:** $340.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 2.5 | $805.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 2.5 | $813.90 |
| **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. | Hours | $41.94 | 2 | $83.88 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario:** #327 - Establishment of seasonal forage or cover for wildlife on non-cropland.

**Scenario Description:**

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario is that this activity will occur on herbaceous areas, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife seasonal forage or seasonal cover..

**Before Situation:**

The existing habitat has an excess of herbaceous perineal habitat, but is lacking high-quality seasonal forage, or the existing cover is too dense and cover conditions found in annual plant communities are absent.

**After Situation:**

The availability of high-quality seasonal forage, or cover condition common in annual plant communities is provided and target wildlife health and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,471.91

**Scenario Cost/Unit:** $147.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 20 | $208.00 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 10 | $158.70 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 10 | $65.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 10 | $213.40 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 10 | $85.00 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Sulfate | 70 | Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.71 | 100 | $71.00 |
| 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 | $0.39 | 60 | $23.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 60 | $19.80 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 10 | $479.50 |

**Practice:** 646 - Shallow Water Development and Management

**Scenario:** #1 - Low Level Management, Natural Ponding

**Scenario Description:**

This scenario addresses inadequate habitat for fish and wildlife on cropland. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Sites are flooded up to a depth of 18" with an average depth of 9". Before flooding, fields may be prepared by rolling residue and/or some grain may be left in the field unharvested. Water is provided by natural flooding and/or precipitation

**Before Situation:**

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates), or has adequate natural topography to provide a reliable seasonal water source. The area is not managed to provide optimum resting, nesting, and feeding habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.).

**After Situation:**

A single or series of shallow water areas are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat utilizing natural ponding (pumping is not required for this scenario). Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). Associated practices include Structure for Water Control (587) and Dike (356) if needed. Depending on local conditions, other Conservation Practices may also be required.

**Feature Measure:** Managed Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $639.81

**Scenario Cost/Unit:** $31.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Foregone Income** | | | | | | |
| FI, Corn Irrigated | 1960 | Irrigated Corn is Primary Crop | Acres | $431.66 | 0.5 | $215.83 |
| FI, Soybeans Irrigated | 1962 | Irrigated Soybeans is Primary Crop | Acres | $384.85 | 0.5 | $192.43 |
| **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. | Hours | $24.46 | 5 | $122.30 |

**Practice:** 646 - Shallow Water Development and Management

**Scenario:** #2 - High Level Management, Pumping

**Scenario Description:**

This scenario addresses inadequate habitat for fish and wildlife on cropland. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Sites are flooded up to a depth of 18" with an average depth of 9". Before flooding, fields may be prepared by rolling residue and/or some grain may be left in the field unharvested. Water is provided by pumping to ensure target levels are met if needed.

**Before Situation:**

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates) to provide a reliable seasonal water source. The area is not managed to provide optimum resting, nesting, and feeding habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.).

**After Situation:**

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded when adequate natural precipitation, runoff, or groundwater recharge is limited. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). Associated practices include Structure for Water Control (587) and Dike (356) if needed and Pumping Plan (533) if a natural water source (i.e. precipitation for flooding) is not available. Depending on local conditions, other Conservation Practices may also be required.

**Feature Measure:** Managed Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $920.71

**Scenario Cost/Unit:** $46.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $187.27 | 1.5 | $280.91 |
| **Foregone Income** | | | | | | |
| FI, Corn Irrigated | 1960 | Irrigated Corn is Primary Crop | Acres | $431.66 | 0.5 | $215.83 |
| FI, Soybeans Irrigated | 1962 | Irrigated Soybeans is Primary Crop | Acres | $384.85 | 0.5 | $192.43 |
| **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. | Hours | $24.46 | 5 | $122.30 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario:** #1 - Mowing

**Scenario Description:**

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation prefered by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 645 Upland Wildlife Habitat Management (edge feathering).

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regeme to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Early successsional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

**Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $392.10

**Scenario Cost/Unit:** $196.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario:** #2 - Disking

**Scenario Description:**

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and exposing bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 645 Upland Wildlife Habitat Management (edge feathering).

**Before Situation:**

The site is static or trending to higher successional plant species. The disturbance regeme to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species suchh as game bird chicks.

**After Situation:**

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openess of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

**Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $189.13

**Scenario Cost/Unit:** $94.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 2 | $20.80 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario:** #3 - Mowing and Disking

**Scenario Description:**

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by mowing dense vegetation and then a light disking to expose bare ground. All mowed areas are also disked. The typical setting for this scenario is at the edge of crop fields, in pastures, idle land and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 645 Upland Wildlife Habitat Management (edge feathering).

**Before Situation:**

The site is static or trending to higher successional plant species. The disturbance regeme to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species suchh as game bird chicks.

**After Situation:**

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openess of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

**Feature Measure:** Width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $412.90

**Scenario Cost/Unit:** $206.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 2 | $20.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario:** #4 - Mowing and Heavy Disking

**Scenario Description:**

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by mowing dense vegetation and then a heavy disking (multiple passes) to expose bare ground. All mowed areas are also disked. The typical setting for this scenario is at the edge of crop fields, in pastures, idle land and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 645 Upland Wildlife Habitat Management (edge feathering).

**Before Situation:**

The site is static or trending to higher successional plant species. The disturbance regeme to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species suchh as game bird chicks.

**After Situation:**

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openess of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

**Feature Measure:** Width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $433.70

**Scenario Cost/Unit:** $216.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 4 | $41.60 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario:** #17 - Strip Spraying

**Scenario Description:**

Inadequate wildlife habitat for a target species is improved by altering plant community succession through strip spraying. Strip spraying can be used to increase structural diversity by creating areas of shorter vegetation preferred by some wildlife species or specific life stages of wildlife species as well as through management of incoming woody plant species. The typical setting for this scenario is at the edge of crop fields, in pastures, in odd areas such as pivot corners, or other areas being managed for wildlife habitat.

**Before Situation:**

The site is currently overly uniform in composition and structure. The disturbance regime is needed based on the Wildlife Habitat Evaluation Guide (WHEG) developed for the target species, guild, or ecosystem desired at this location.

**After Situation:**

A more desirable, heterogeneous plant community (composition and structure) is restored. Strip spraying has created alternating bands of early and later (untreated) successional habitat. The heterogeneity of the habitat structure has been increased.

**Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $303.34

**Scenario Cost/Unit:** $60.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2.5 | $14.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| **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. | Acres | $9.21 | 2.5 | $23.03 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #2 - Nesting Box, Small, with pole

**Scenario Description:**

Constructing a nest box and mounting on a pole. A structure is provided to support the nesting and rearing of targeted species, such as pollinators and birds. Trees, buildings or other structures are not available. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

This area lacked sufficient nesting sites to support viable populations of targeted species. Location and conditions suggest that predator guards are not needed.

**After Situation:**

The installation nesting and rearing boxes support the life-cycle needs of targeted speces, such as blue birds and waterfowl. Location and conditions suggest that predator guards are not needed. These structures/features enhance habitat, cover, and improve species survivability.

**Feature Measure:** Number of structures with poles.

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $64.91

**Scenario Cost/Unit:** $64.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.75 | $18.35 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $16.70 | 1 | $16.70 |
| Habitat Box, Bird | 251 | Bluebird nesting box to increase nesting success. Each is 1-1/2 x 6 x 12-1/2 Inch with a 1-1/2 inch diameter opening. Includes materials and shipping. | Each | $29.86 | 1 | $29.86 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #4 - Nesting Box or Raptor Perch, Large, with Pole

**Scenario Description:**

Constructing a nest box or rapture perch on a steel pole with a predator guard where needed. A structure is provided to support the nesting and rearing of larger targeted species such as woodducks, bats, barn owls or to provide needed perches or nesting structures for raptures. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

The area lacks sufficient overall nesting sites to support viable populations of targeted species. Predator guards provide needed protection of target species during nesting and rearing.

**After Situation:**

The installation of pole mounted nesting and rearing boxes support the life-cycle needs of targeted species, such as bats and waterfowl.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $396.15

**Scenario Cost/Unit:** $396.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $182.42 | 0.1 | $18.24 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 0.5 | $10.35 |
| **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. | Hours | $24.46 | 1.5 | $36.69 |
| **Materials** | | | | | | |
| Pipe, steel, galvanized, threaded, 1 1/4 inch, schedule 40 | 256 | Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10' OC | Feet | $21.37 | 10 | $213.70 |
| Habitat Box, waterfowl | 1449 | Wood Duck Box, typically 24x11x12 inch with 4 inch wide oval entrance, single. Includes material and shipping only. | Each | $80.77 | 1 | $80.77 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $36.40 | 1 | $36.40 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #5 - Escape Ramp

**Scenario Description:**

Retrofit an existing watering trough/tank with an appropriately designed and installed wildlife escape ramp to reduce wildlife mortality and maintain water quality within the watering facility.

**Before Situation:**

Existing watering facilities lack escape potential for wildlife. This results in death of the small wildlife accessing the facility for water, and resulting poor water quality as the animal decays.

**After Situation:**

Watering facilities provide wildlife safe access. Water quality is improved within the watering facility and wildlife mortality is reduced.

**Feature Measure:** Each Ramp

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $75.24

**Scenario Cost/Unit:** $75.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound | Each | $63.01 | 1 | $63.01 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #6 - Fence Markers, Vinyl Undersill

**Scenario Description:**

Existing fences are retrofitted with vinyl markers that increase wire visibility and reduce mortality due to collision for wildlife species of concern. Markers are installed approximately every 3 feet along top wire. Scenario is typically implemented along fences in potential high risk areas (red areas in SGI Fence Collision Risk Model) or where a known problem exists.

**Before Situation:**

Wire fences located in high risk areas pose a collision threat to wildlife of special concern.

**After Situation:**

Fence related mortality of species of special concern is reduced.

**Feature Measure:** feet of fence marked

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $225.05

**Scenario Cost/Unit:** $0.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 0.5 | $10.35 |
| **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. | Hours | $24.46 | 5 | $122.30 |
| **Materials** | | | | | | |
| Vinyl Undersill Strips | 241 | Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only. | Feet | $0.07 | 1320 | $92.40 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #7 - Brush Pile, Small

**Scenario Description:**
Small brush piles are created to provide shrubby/woody escape cover for wildlife. Pushing or cutting of select small trees and placement in selected locations to provide wildlife cover. Typical scenario of 10' x 20' area for structure covered by interlocking limbs of trees less than 12 inches in diameter.

**Before Situation:**
The existing habitat lacks escape, ground nesting and safe loafing cover.

**After Situation:**
Small brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

**Feature Measure:** brush piles

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $39.54

**Scenario Cost/Unit:** $39.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 0.5 | $26.93 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 0.5 | $12.61 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #8 - Downed Tree Structure

**Scenario Description:**

Downed tree structures will be created to provide shrubby/woody escape cover for wildlife. Felling of select trees and placement in selected locations to provide wildlife cover. Minimum 30' x 50' area for structure covered by interlocking limbs of trees at least 12" in diameter. Payment includes tree felling and placement. Facilitating practices may include but not limited to: Upland Wildlife Habitat Management (645), Wetland Creation (658), Wetland Restoration (657), Wetland Enhancement (659), Early Successional Habitat Management/Development (647), Prescribed Burning (338), Restoration and Management of Rare and Declining Habitats (643), and Conservation Cover (327).

**Before Situation:**

A 40 acre operation managing for quail and other small game habitat. Shrubby/woody escape cover is often the missing habitat component for bobwhite quail and other small game in fields managed for upland wildlife wildlife.

**After Situation:**

The installation of a downed tree structure enhances the overall habitat needs of quail and other small game species. These structures/features enhance habitat and improve species survivability.

**Feature Measure:** area covered by structure

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $261.84

**Scenario Cost/Unit:** $261.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 2 | $14.00 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 2 | $99.56 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #9 - Edgefeathering, light

**Scenario Description:**

Trees are cut and brush clipped in the border along a woodland edge using a chainsaw to create dense woody cover and a transitional area between a timbered edge and the adjacent land use such as cropland, pasture, or idle lands. The edge feathering will extend at least 30' wide, measured from the outside tree trunk, and at least 50' long -- resulting in a minimum area of 1500 square feet covered by interlocking woody branches. Cut stumps will be treated with brush herbicide. Some hand placement of the cut trees is necessary. Facilitating practices may include but not limited to: Upland Wildlife Habitat Management (645), Wetland Creation (658), Wetland Restoration (657), Wetland Enhancement (659), Early Successional Habitat Management/Development (647), Prescribed Burning (338), Restoration and Management of Rare and Declining Habitats (643), and Conservation Cover (327).

**Before Situation:**

Forested land with a hard edge of mature trees adjacent to cropland or pasture. Woody cover is lacking for wildlife species such as rabbits, quail, songbirds and other wildlife species requiring dense woody cover near ground level. Average diameter of the main stand trees is 4 inches or less.

**After Situation:**

The cut trees serve as brush small piles, enhancing the overall habitat needs of wildlife species requiring dense woody cover and increase survival and the population of these species.

**Feature Measure:** area covered by edgefeathering

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $633.51

**Scenario Cost/Unit:** $633.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 14.5 | $101.50 |
| **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. | Hours | $24.46 | 21.75 | $532.01 |

**Practice:** 649 - Structures for Wildlife

**Scenario:** #10 - Edgefeathering, heavy

**Scenario Description:**

Trees are cut and brush clipped in the border along a woodland edge using a tractor and chainsaw to create dense woody cover and a transitional area between a timbered edge and the adjacent land use such as cropland, pasture, or idle lands. The edge feathering will extend at least 30' wide, measured from the outside tree trunk, and at least 50' long -- resulting in a minimum area of 1500 square feet covered by interlocking woody branches. Cut stumps will be treated with brush herbicide. Some hand placement of the cut trees is necessary. Facilitating practices may include but not limited to: Upland Wildlife Habitat Management (645), Wetland Creation (658), Wetland Restoration (657), Wetland Enhancement (659), Early Successional Habitat Management/Development (647), Prescribed Burning (338), Restoration and Management of Rare and Declining Habitats (643), and Conservation Cover (327).

**Before Situation:**

Forested land with a hard edge of mature trees adjacent to cropland or pasture. Woody cover close to the ground is lacking for wildlife species such as rabbits, quail, songbirds and other wildlife species requiring dense woody cover near ground level. Average diameter of the main stand trees is greater than 4 inches.

**After Situation:**

Creation of woody debris and small piles improves the overall habitat needs of wildlife species requiring dense woody cover and increase survival and the population of these species.

**Feature Measure:** area covered by edgefeathering

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,070.85

**Scenario Cost/Unit:** $1,070.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 14.5 | $101.50 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 7.25 | $360.91 |
| **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. | Hours | $24.46 | 17.4 | $425.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 7.25 | $182.85 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario:** #1 - Removal and/or Thinning with Chain Saw

**Scenario Description:**

Windbreak renovation requires the removal of degraded, overcrowded, or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, and/or selected trees/shrubs in order to prepare for the necessary planting of a replacement row or parts of the row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns: Degrade plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

**Before Situation:**

Plant (trees and/or shrubs) health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material and some are completley dead. Wind now moves freely thru areas that lack any leaves.

**After Situation:**

Integrity and function of windbreak restored. 1,000 feet of windbreak/shelterbelt renovated.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $680.34

**Scenario Cost/Unit:** $0.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 10 | $70.00 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.13 | 2 | $4.26 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 1 | $27.92 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario:** #2 - Within Row Replacement, Containerized Planting Stock

**Scenario Description:**

Parts of the windbreak being renovated have died. Supplemental plantings of containerized trees/shrubs within existing rows or establishment of an additional row will improve the effectiveness and longevity of the windbreak. Payment includes materials, labor and equipment needed to hand plant the stock. Resource concerns include Soil erosion - Wind erosion, Degraded plant condition -Inadequate structure and composition, and Livestock production limitation - Inadequate livestock shelter.

**Before Situation:**

Sections of the windbreak had dead trees/shrubs that were inhibiting windbreak effectiveness. The dead plants have been removed and the site has been prepared for planting.

**After Situation:**

The integrity and function of the windbreak is restored by hand planting containerized trees/shrubs in gaps created through previous plant moratlity.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,139.62

**Scenario Cost/Unit:** $2.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 3 | $34.41 |
| **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. | Hours | $24.46 | 3 | $73.38 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $14.60 | 25 | $365.00 |
| Tree, Conifer, Potted, Medium | 1537 | Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $13.76 | 25 | $344.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 50 | $6.00 |
| 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 | $0.54 | 50 | $27.00 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario:** #4 - Within Row Replacement, Bare-root Planting Stock

**Scenario Description:**

Parts of the windbreak being renovated have died. Supplemental plantings of bare-root trees/shrubs within existing rows or establishment of an additional row will improve the effectiveness and longevity of the windbreak. Payment includes materials, labor and equipment needed to hand plant the stock. Resource concerns include Soil erosion - Wind erosion, Degraded plant condition -Inadequate structure and composition, and Livestock production limitation - Inadequate livestock shelter.

**Before Situation:**

Sections of the windbreak had dead trees/shrubs that were inhibiting windbreak effectiveness. The dead plants have been removed and the site has been prepared for planting.

**After Situation:**

The integrity and function of the windbreak is restored by hand planting bare-root trees/shrubs in gaps created through previous plant moratlity.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $225.04

**Scenario Cost/Unit:** $0.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $11.47 | 1 | $11.47 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 25 | $38.00 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.86 | 25 | $21.50 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows | Each | $0.12 | 50 | $6.00 |
| 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 | $0.54 | 50 | $27.00 |

**Practice:** 655 - Forest Trails and Landings

**Scenario:** #1 - Water Bar Installation

**Scenario Description:**

Rehabilitation of existing forest access trails and landings by addressing erosion and sedimentation through the installation of water bars and light shaping/grading between water bars. Typically the trail is a single lane, existing 12-foot wide seasonal or temporary trail on a moderate slope (10%) on forestland requiring sustained erosion control measures applied by using traditional logging equipment such as a log skidder or dozer. The purpose is to hydrologically disconnect existing trail/landing system from the streams and natural drainages. This scenario applies to only those segments of the trail system that have resource concerns requiring rehabilitation. A typical water bar installed in this scenario is on a 75 to 80 foot spacing with a depth of about 1 foot. Some hand work (chainsaw) will be needed to allow the use of the equipment without causing damage to residual trees. The work will be supervised. No mobilization is required, as equipment and personel are already on site. Other practices such as Stream Crossing, and Critical Area Planting, Access Road and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario . Resource concerns include: Excessive sedimentation in surface waters, Concentrated flow erosion, Sheet and rill erosion, and Degradation of wildlife species.

**Before Situation:**

Trails are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

Trails and landings provide access and do not adversely affect the resources concerns.

**Feature Measure:** Number of water bars

**Scenario Unit:** Each

**Scenario Typical Size:** 34.0

**Scenario Total Cost:** $2,123.32

**Scenario Cost/Unit:** $62.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 1 | $7.00 |
| Log skidder | 942 | Equipment and power unit costs. Labor not included. | Hours | $121.72 | 3 | $365.16 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $2.83 | 510 | $1,443.30 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 3 | $90.18 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |

**Practice:** 655 - Forest Trails and Landings

**Scenario:** #2 - Shaping and Grading

**Scenario Description:**

Rehabilitation of existing forest access trails and landings by addressing rutting, erosion, and sedimentation through shaping and grading and installing other widely spaced mitigating practices such as broad based drainage dips, water bars, and water turnouts. Typically the trail is a single lane, existing 12-foot wide seasonal or temporary trail on a relatively flat slopes (2%) on forestland requiring sustained erosion control measures applied by using traditional logging equipment such as a log skidder or dozer. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised. Other practices such as Stream Crossing, and Critical Area Planting. Access Road and Structure for Water Control can be adjacent/appurtenant but not part of the practice scenario. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes. Resource concerns include: Excessive sediment in surface waters, Concentrated and Sheet & rill flow erosion, Soil compaction, and Habitat degradation.

**Before Situation:**

Trail/landings are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

**Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,640.0

**Scenario Total Cost:** $1,412.85

**Scenario Cost/Unit:** $0.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 1 | $7.00 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 30 | $698.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 655 - Forest Trails and Landings

**Scenario:** #3 - Shaping and Grading with Vegetation Establishment

**Scenario Description:**

Rehabilitation of existing forest access trails and landings by addressing rutting, erosion, and sedimentation through shaping and grading and installing other widely spaced mitigating practices such as broad based drainage dips, water bars, and water turnouts. It also includes seedbed preparation, seeding and soil amendments determined to be needed. Typically the trail is a single lane, existing 12-foot wide seasonal or temporary trail on a relatively flat slope (2%) on forestland requiring sustained erosion control measures applied by using traditional logging equipment such as a log skidder or dozer. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised. Other practices such as Stream Crossing, and Critical Area Planting. Access Road and Structure for Water Control can be adjacent/appurtenant but not part of the practice scenario. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes. Resource concerns include: Excessive sediment in surface waters, Concentrated and Sheet & rill flow erosion, Soil compaction, and Habitat degradation.

**Before Situation:**

Trail/landings are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

**Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,640.0

**Scenario Total Cost:** $1,944.25

**Scenario Cost/Unit:** $0.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 4 | $216.16 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 1 | $7.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 0.73 | $7.59 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 0.73 | $4.75 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 0.73 | $5.86 |
| 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. | Acres | $11.75 | 0.73 | $8.58 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 2 | $41.40 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| 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 | $0.52 | 60 | $31.20 |
| 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 | $0.39 | 90 | $35.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 90 | $29.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 0.5 | $8.12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yards | $23.27 | 30 | $698.10 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.73 | $22.45 |
| **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 | $168.33 | 2 | $336.66 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 655 - Forest Trails and Landings

**Scenario:** #62 - Log Landing Shaping and Grading with Vegetation Establishment

**Scenario Description:**

Rehabilitation of existing log landings by addressing rutting, erosion, and sedimentation through shaping and grading and establishing vegetative cover, including seedbed preparation, seeding and soil amendments determined to be needed. Typically the landing is 0.5 acres on a relatively flat slope (<2%) on forestland requiring sustained erosion control measures applied by using traditional logging equipment such as a log skidder or dozer. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised. Other practices such as Stream Crossing, and Critical Area Planting. Access Road and Structure for Water Control can be adjacent/appurtenant but not part of the practice scenario. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes. Resource concerns include: Excessive sediment in surface waters, Concentrated and Sheet & rill flow erosion, Soil compaction, and Habitat degradation.

**Before Situation:**

Log landings are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

The log landings are shaped/graded and established to permanent cover and do not cause excessive erosion or water quality concerns.

**Feature Measure:** size of landing treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.5

**Scenario Total Cost:** $819.31

**Scenario Cost/Unit:** $1,638.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 0.5 | $27.02 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 0.5 | $3.50 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 0.5 | $5.20 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.50 | 0.5 | $3.25 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $8.03 | 0.5 | $4.02 |
| 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. | Acres | $11.75 | 0.5 | $5.88 |
| **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. | Hours | $24.46 | 0.5 | $12.23 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 0.5 | $15.03 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| 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 | $0.52 | 15 | $7.80 |
| 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 | $0.39 | 45 | $17.55 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.33 | 45 | $14.85 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $16.24 | 0.25 | $4.06 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 0.5 | $15.38 |

**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 | $168.33 | 2 | $336.66 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 656 - Constructed Wetland

**Scenario:** #1 - Constructed Wetland, Dense Planting

**Scenario Description:**

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff or effluent from a drainage system high in nutrients. All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrients and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634); Critical Area Planting (342); Filter Strip (393).

**Before Situation:**

Degraded water quality and/or ponding due to the nutrient content and/or sediment of agricultural runoff.

**After Situation:**

A 1 acre constructed wetland (measured by the size of the treatment pool suitable for wetland vegetation) will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Vegetation is planted at a spacing of 3 by 3 feet. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by creating conditions at the plant/soil/water interface for biochemical nutrient removal before the effluent is transported to a waste storage facility or discharged off site if permitted by regulation.

**Feature Measure:** Area of Constructed Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $11,214.18

**Scenario Cost/Unit:** $11,214.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $309.40 | 1 | $309.40 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 807 | $718.23 |
| 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 Yards | $2.17 | 1613 | $3,500.21 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.25 | $80.52 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.25 | $81.39 |
| **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. | Hours | $24.46 | 48.4 | $1,183.86 |
| **Materials** | | | | | | |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.00 | 4840 | $4,840.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 656 - Constructed Wetland

**Scenario:** #2 - Constructed Wetland, Light Planting

**Scenario Description:**

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff or effluent from a drainage system high in nutrients. All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrients and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634); Critical Area Planting (342); Filter Strip (393).

**Before Situation:**

Degraded water quality and/or ponding due to the nutrient content and/or sediment of agricultural runoff.

**After Situation:**

A 1 acre constructed wetland (measured by the size of the treatment pool suitable for wetland vegetation) will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Vegetation is planted at a wide spacing of 4 by 4 feet. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by creating conditions at the plant/soil/water interface for biochemical nutrient removal before the effluent is transported to a waste storage facility or discharged off site if permitted by regulation.

**Feature Measure:** Area of Constructed Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,578.62

**Scenario Cost/Unit:** $8,578.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $309.40 | 1 | $309.40 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 807 | $718.23 |
| 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 Yards | $2.17 | 1613 | $3,500.21 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.25 | $80.52 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.25 | $81.39 |
| **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. | Hours | $24.46 | 27.2 | $665.31 |
| **Materials** | | | | | | |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.00 | 2723 | $2,723.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 656 - Constructed Wetland

**Scenario:** #12 - Constructed Wetland, Earthwork only

**Scenario Description:**

This practice scenario includes the basic earthwork needed to create a constructed wetland to treat storm water runoff or outflow from a subsurface drainage system high in nutrients. Hydrophytic vegetation will be established through natural regeneration. All other components, such as water control structures, dikes, vegetation or upstream sediment basins, must be paid for under facilitating practices. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrients and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Soil Treatment (520); Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634); Critical Area Planting (342); Filter Strip (393).

**Before Situation:**

Degraded water quality due to the nutrient content of storm water runoff or tile discharge from a subsurface drainage system.

**After Situation:**

A 1 acre constructed wetland (measured by the size of the treatment pool suitable for wetland vegetation) will be constructed with an average 18" depth. Only the earthwork is considered in this scenario. Hydrophytic vegetation will be established through natural regeneration. Any structures, vegetation or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the inflow by creating conditions at the plant/soil/water interface for biochemical nutrient removal before it is discharged off site.

**Feature Measure:** Area of Constructed Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,940.03

**Scenario Cost/Unit:** $4,940.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $309.40 | 1 | $309.40 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 807 | $718.23 |
| 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 Yards | $2.17 | 1613 | $3,500.21 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.25 | $80.52 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.25 | $81.39 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** 657 - Wetland Restoration

**Scenario:** #1 - Mineral Flat, Tile Removal

**Scenario Description:**

A Mineral Flat wetland is to be restored. The wetland size is 40 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

**After Situation:**

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 6 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $13,809.97

**Scenario Cost/Unit:** $345.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 8 | $486.88 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 20 | $6,441.80 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 20 | $6,511.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 657 - Wetland Restoration

**Scenario:** #2 - Riverine Levee Removal, ditch plugs and floodplain features

**Scenario Description:**

A Riverine HGM tract on a large floodplain is to be restored. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The wetland extent is 60 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

**After Situation:**

The hydrology of the site is restored with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 60.0

**Scenario Total Cost:** $72,120.85

**Scenario Cost/Unit:** $1,202.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 36 | $7,287.48 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 113 | $39,969.23 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 30 | $9,662.70 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 30 | $9,766.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 149 | $4,478.94 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 657 - Wetland Restoration

**Scenario:** #3 - Depression Sediment Removal and Ditch Plug

**Scenario Description:**

A Depressional HGM class wetland is to be restored. The wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4- SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

**After Situation:**

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $28,836.44

**Scenario Cost/Unit:** $2,883.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 2 | $404.86 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 63 | $22,283.73 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 65 | $1,953.90 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 657 - Wetland Restoration

**Scenario:** #4 - Riverine Channel and Floodplain Restoration

**Scenario Description:**

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been partially converted to agricultural production on 10 acres of the 15 acre wetland tract. The stream channel has degraded. The reach is 1500 feet in length. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11-WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

**After Situation:**

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 0.5 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $21,309.09

**Scenario Cost/Unit:** $1,420.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 34 | $6,882.62 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 24 | $8,489.04 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 58 | $1,743.48 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 657 - Wetland Restoration

**Scenario:** #5 - Vernal Pool

**Scenario Description:**

Restoration of vernal pools on suitable sites within areas of hardwood forest. This involves restoration of hydrology to a vernal pool site that provides season shallow surface water . Resource concerns include INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site has mature trees and vegetation typical to vernal pools but the hydrology of the site has been altered such that the site no longer is inundated seasonally which is required for wildlife that are dependent on vernal pools for part of their life cycle. The existing native vegetation precludes the use of standard wetland restoration construction methods.

**After Situation:**

Seasonal inundation of the site has been restored to the site without significant disturbance to the native vegetation. Wildlife habitat for species that utilize vernal pools has been restored to the site.

**Feature Measure:** Area of pool

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.3

**Scenario Total Cost:** $2,428.64

**Scenario Cost/Unit:** $9,714.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 16 | $500.64 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 24 | $605.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 657 - Wetland Restoration

**Scenario:** #6 - Riverine, oxbow wetland

**Scenario Description:**

Restoration of an 0.40 acre oxbow wetland to create off-channel habitat for species such as Topeka Shiner. Includes removal of post settlement alluvium down to the original soil surface, slope, and contour. Reconnection of the oxbow to the stream channel using original, natural inflow and outflow channels will include excavation of post settlement alluvium to the original soil surface, slope, and contour. Resource concerns include habitat degradation and excessive sedimentation.

**Before Situation:**

Backwater lakes and oxbows have become filled with sediment eliminating or degrading habitat for fish and other aquatic organisms. Substrates are not compact enough to support emergent vegetation. The stream is no longer connected to this off-channel habitat necessary for parts of the life cycle of fish and aquatic organisms that live in the main channel.

**After Situation:**

A 0.4 acre off-channel oxbow (35' bottom width, 56' topwidth, 3.5' depth, 310 feet long) is excavated to remove the post settlement alluvium down to orginal soil surface, slope and contour. Oxbow is reconnected to the stream channel by excavating the orginal inflow and outflow channels to post setlement grade, slope and contour.

**Feature Measure:** area of excavation

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.4

**Scenario Total Cost:** $9,036.08

**Scenario Cost/Unit:** $22,590.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 18 | $1,847.34 |
| 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. | Hours | $128.05 | 36 | $4,609.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 54 | $1,623.24 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 658 - Wetland Creation

**Scenario:** #1 - Excavated

**Scenario Description:**

A wetland is created on a flat mineral upland at a location where surface runoff may be intercepted and ponded by excavation. Resource concerns are 22 - INDEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site is in cropland on an upland, non floodplain site (interfluve).

**After Situation:**

An excavation with an average depth of 12" has created a shallow depression in a broad swale which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $19,199.02

**Scenario Cost/Unit:** $3,839.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 Yards | $2.12 | 8067 | $17,102.04 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 2.5 | $805.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 2.5 | $813.90 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 658 - Wetland Creation

**Scenario:** #2 - Embankment

**Scenario Description:**

A wetland is created on a flat mineral upland at a location where surface runoff may be intercepted and ponded by excavation and with an embankment. Facilitating practices may include Structure for Water Control (587). Resource concerns are 22 - INDEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site is in cropland on an upland, non floodplain site (interfluve).

**After Situation:**

An excavation/embankment with an average depth of 12" has created a shallow depression in a broad swale which intercepts surface runoff. The excavated material has been spread on adjacent areas and used to compact the embankment. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $18,683.23

**Scenario Cost/Unit:** $3,736.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 125 | $12,828.75 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 2.5 | $805.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 2.5 | $813.90 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 125 | $3,757.50 |
| **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 | $477.85 | 1 | $477.85 |

**Practice:** 659 - Wetland Enhancement

**Scenario:** #1 - Mineral Flat, Tile Removal

**Scenario Description:**

A Mineral Flat wetland is to be enhanced. The tract size is 40 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. The wetland size is also 40 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

**After Situation:**

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 6 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Enhancement of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $13,809.97

**Scenario Cost/Unit:** $345.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $60.86 | 8 | $486.88 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 20 | $6,441.80 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 20 | $6,511.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 8 | $201.76 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** 659 - Wetland Enhancement

**Scenario:** #2 - Riverine, Levee Removal, ditch plugs and floodplain features

**Scenario Description:**

A Riverine HGM tract on a large floodplain is to be enhanced. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The wetland extent is 60 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

**After Situation:**

The hydrology of the site is enhanced with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 60.0

**Scenario Total Cost:** $72,120.85

**Scenario Cost/Unit:** $1,202.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 36 | $7,287.48 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 113 | $39,969.23 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 30 | $9,662.70 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 30 | $9,766.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 149 | $4,478.94 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 659 - Wetland Enhancement

**Scenario:** #3 - Depression, Sediment Removal and Ditch Plug

**Scenario Description:**

A Depressional HGM class wetland is to be enhanced. The wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

**After Situation:**

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $28,836.44

**Scenario Cost/Unit:** $2,883.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 2 | $404.86 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 63 | $22,283.73 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 65 | $1,953.90 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 659 - Wetland Enhancement

**Scenario:** #4 - Riverine, Channel and Floodplain Restoration

**Scenario Description:**

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

**After Situation:**

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $21,309.09

**Scenario Cost/Unit:** $2,130.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $202.43 | 34 | $6,882.62 |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $353.71 | 24 | $8,489.04 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 5 | $1,610.45 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 5 | $1,627.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 58 | $1,743.48 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** 659 - Wetland Enhancement

**Scenario:** #5 - Vernal Pool

**Scenario Description:**

Wetland hardwood forest with sites that have potential to be enhanced with vernal pools. This involves enhancement of hydrology of a vernal pool site that provides season shallow surface water . Resource concerns include INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site has mature trees and vegetation typical to vernal pools but the the site does not pond water seasonally which is required for wildlife that are dependent on vernal pools for part of their life cycle. The existing native vegetation precludes the use of standard wetland enhancement construction methods.

**After Situation:**

Seasonal inundation of the site has been enhanced on the site without significant disturbance to the native vegetation. Wildlife habitat for species that utilize vernal pools has been developed on the site.

**Feature Measure:** Area of pool

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.3

**Scenario Total Cost:** $2,428.64

**Scenario Cost/Unit:** $9,714.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.29 | 16 | $500.64 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.85 | 8 | $430.80 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 24 | $605.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 2 | $500.56 |

**Practice:** 666 - Forest Stand Improvement

**Scenario:** #1 - Forest Stand Improvement, Light

**Scenario Description:**

All materials and labor required to manipulate species composition, stand structure and stocking on forestland. Light forest stand improvement will: Reduce basal area by 20 - 29 square feet per acre (or) Cut and/or kill 100 - 199 trees per acre (or) Release 10 - 20 crop trees per acre and/or kill any vines growing on crop trees by an approved method such as "cut stump" with herbicide to prevent resprouting. Use a current and approved Forest Managment Plan for estimated basal area to be removed, number of trees needing to be cut and/or killed, crop trees needing to be released, and/or vines needing killed.

**Before Situation:**

Forest stand is slightly overstocked and/or composed of some undesirable species due to lack of forest management. This has negatively impacted forest health, productivity, and/or sustainability. Wildlife habitat,such as hard and soft mast production, browse, nesting cover, bedding areas, etc. is lacking.

**After Situation:**

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

**Feature Measure:** Area Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 55.0

**Scenario Total Cost:** $6,496.65

**Scenario Cost/Unit:** $118.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 90 | $630.00 |
| 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. | Hours | $70.17 | 20 | $1,403.40 |
| **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. | Hours | $31.49 | 110 | $3,463.90 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 55 | $999.35 |

**Practice:** 666 - Forest Stand Improvement

**Scenario:** #2 - Forest Stand Improvement, Medium

**Scenario Description:**

All materials and labor required to manipulate species composition, stand structure and stocking on forestland. Medium forest stand improvement will: Reduce basal area by 30-40 square feet per acre (or) Cut and/or kill 200 - 400 trees per acre (or) Release 21 - 40 crop trees per acre and kill any vines growing on crop trees by an approved method such as "cut stump" with herbicide to prevent resprouting. Use a current and approved Forest Managment Plan for estimated basal area to be removed, number of trees needing to be cut and/or killed, crop trees needing to be released, and/or vines needing killed.

**Before Situation:**

Forest stand is moderately overstocked and/or composed of an unacceptable level of undesirable species due to lack of forest management. This has negatively impacted forest health, productivity, and/or sustainability. Wildlife habitat, such as hard and soft mast production, browse, nesting cover, bedding areas, etc. is lacking.

**After Situation:**

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

**Feature Measure:** Area Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 55.0

**Scenario Total Cost:** $7,953.39

**Scenario Cost/Unit:** $144.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 112 | $784.00 |
| 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. | Hours | $70.17 | 26 | $1,824.42 |
| **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. | Hours | $31.49 | 138 | $4,345.62 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 55 | $999.35 |

**Practice:** 666 - Forest Stand Improvement

**Scenario:** #3 - Forest Stand Improvement, Heavy

**Scenario Description:**

All materials and labor required to manipulate species composition, stand structure and stocking on forestland. Heavy forest stand improvement will: Reduce basal area by 41 or more square feet per acre (or) Cut and/or kill over 400 trees per acre (or) Release 41 or more crop trees per acre and kill any vines growing on crop trees by an approved method such as "cut stump" with herbicide to prevent resprouting. Use a current and approved Forest Managment Plan for estimated basal area to be removed, number of trees needing to be cut and/or killed, crop trees needing to be released, and/or vines needing killed.

**Before Situation:**

Forest stand is heavily overstocked and/or composed of an unacceptable level of undesirable species due to lack of forest management. This has negatively impacted forest health, productivity, and/or sustainability. Wildlife habitat, such as hard and soft mast production, browse, nesting cover, bedding areas, etc. is lacking. Understory vegetation consists of mostly shade-tolerant species with little to no desirable regeneration present.

**After Situation:**

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

**Feature Measure:** Area Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 55.0

**Scenario Total Cost:** $10,036.84

**Scenario Cost/Unit:** $182.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 145 | $1,015.00 |
| 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. | Hours | $70.17 | 34 | $2,385.78 |
| **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. | Hours | $31.49 | 179 | $5,636.71 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 55 | $999.35 |

**Practice:** 666 - Forest Stand Improvement

**Scenario:** #4 - Temporary Forest Openings, patch clearcuts

**Scenario Description:**

Creating 2 one acre patches in over-mature and/or degraded stands using hand tools such as chainsaws. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation.

**Before Situation:**

The existing stand is overly mature and/or has been degraded in value by past harvesting practices. The level of acceptable growing stock is too low to justify managing this stand in its present condition. The present form, species composition and structure cannot meet the resource concerns and landowner objectives. Creating small openings by cutting all trees greater than 2" in diameter will foster the regeneration of high-value shade intolerant species. The work will be done with chainsaws.

**After Situation:**

A new, young stand of desirable species is established In addition, early successional wildlife habitat as well as forest type diversity are created.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $615.84

**Scenario Cost/Unit:** $307.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 16 | $112.00 |
| **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. | Hours | $31.49 | 16 | $503.84 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario:** #1 - Lighting - Outdoor or High Bay Fixture Conversion

**Scenario Description:**

Installation of a lighting system consisting of an outdoor light or an indoor high bay light such as, but not limited to, LED or pulse-start metal halide (PSMH) lamp with a matched ballast. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required. Payment includes lamp, fixtures and labor to install.

**Before Situation:**

Inefficient high-bay or exterior lighting (such as mercury vapor, T12 fluorescent, or similar) as evidenced by an on-farm energy audit.

**After Situation:**

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (KW) compared to the existing lighting system as evidenced by the energy audit. 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. Associated practices/activities: 122-AgEMP - HQ, 672 Building Envelope Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Each lamp replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $339.07

**Scenario Cost/Unit:** $339.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 3 | $94.47 |
| **Materials** | | | | | | |
| High Bay, LED, >= 13,000 Lumens, Wet Location rated | 2641 | High Bay, Light Emitting Diode (LED), typically 4,000K, minimum 50,000 hour lifespan, rated for wet locations. Includes materials only. | Each | $244.60 | 1 | $244.60 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario:** #2 - Lighting - LED

**Scenario Description:**

To install dimmable LEDs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. LED requirements: minimum 6 Watt, 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketted or weatherproof housings are required to prevent corrosion and premature failure.

**Before Situation:**

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

**After Situation:**

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit.Associated practices/activities: 122-AgEMP - HQ and 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.

**Feature Measure:** Each lamp replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $12.48

**Scenario Cost/Unit:** $12.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.17 | $4.16 |
| **Materials** | | | | | | |
| Lighting, bulb, LED, dimmable, minimum 450 lumens | 1167 | Light Emitting Diode (LED), typically 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. Materials only. | Each | $8.32 | 1 | $8.32 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario:** #3 - Lighting - Indoor Fixture Conversion

**Scenario Description:**

Installation of a lighting system consisting of a four-foot, three-lamp fixture with a single electronic ballast. The high-efficiency lighting system uses high-efficiency LED or T8 or T5 fluorescent lamps. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required. Payment includes lamps, ballast, fixtures and labor to install.

**Before Situation:**

Inefficient lighting (such as incandescent or T12 fluorescent tubes driven by magnetic ballasts) as evidenced by an on-farm energy audit.

**After Situation:**

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. 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. Associated practices/activities: may include 122-AgEMP - HQ, 672 Building Envelope Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Each fixture replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $360.97

**Scenario Cost/Unit:** $360.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Lighting, Fixture, LED, min. 6,000 Lumens, wet location rated. | 2627 | Lighting fixture with 4 linear Light Emitting Diode (LED) lamps (4 foot tall) with a minimum of 6,000 lumens per fixture. Minimum of 50,000 hour lifespan. Includes materials and shipping only. | Each | $329.48 | 1 | $329.48 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario:** #4 - Lighting - Outdoor or High Bay Bulb Replacement

**Scenario Description:**

Installation of a lighting system consisting of an outdoor light or an indoor high bay light such as, but not limited to, LED or pulse-start metal halide (PSMH) lamp. Light fixtures do not have to be replaced. Appropriate disposal of existing lamps, ballasts and other materials is required. Payment includes light bulb and labor to install.

**Before Situation:**

Inefficient high-bay or exterior lighting (such as mercury vapor, T12 fluorescent, or similar) as evidenced by an on-farm energy audit.

**After Situation:**

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. 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. Associated practices/activities: may include 122-AgEMP - HQ, 672 Building Envelope Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Each lamp replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $248.76

**Scenario Cost/Unit:** $248.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 0.17 | $4.16 |
| **Materials** | | | | | | |
| High Bay, LED, >= 13,000 Lumens, Wet Location rated | 2641 | High Bay, Light Emitting Diode (LED), typically 4,000K, minimum 50,000 hour lifespan, rated for wet locations. Includes materials only. | Each | $244.60 | 1 | $244.60 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario:** #22 - Lighting - Indoor Fixture Conversion, Multiple Fixture Upgrade

**Scenario Description:**

Installation of a lighting system consisting of multiple high efficiency LED light fixtures and lamps providing equivalent lighting levels to the fixture being replaced. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials as required. Payment includes, lamps, fixture, wiring components, and labor to install. Payment is based on each original fixture that is replaced by multiple fixtures of upgraded LEDs. For example, if a building has 20 existing high pressure sodium light fixtures which are replaced by 100 LED fixtures, the contract item number quantity is 20.

**Before Situation:**

Inefficient lighting (such as high pressure sodium light fixtures) as evidenced by an on farm energy audit.

**After Situation:**

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. 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. Associated practices/activities: may include 128-AgEMP, 672 Building Envelope Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Each Original Fixture Replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $162.30

**Scenario Cost/Unit:** $162.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Lighting, LED Lamp, minimum 90 Lum/Watt, <= 20 watts | 2599 | LED lamp (bulb) rated for damp locations, dimmable. Includes Materials only. | Watt | $0.84 | 60 | $50.40 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #1 - Building Envelope - Attic Insulation

**Scenario Description:**

Install a minimum R-7 insulation in an existing attic or ceiling to reduce heat transfer. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate. Payment includes materials, equipment and labor to install.

**Before Situation:**

An agriculture house with an inefficient building envelope with limited attic insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. 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. Associated practices/activities: 122-AgEMP - HQ, 670- Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Area of Attic Insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 20,000.0

**Scenario Total Cost:** $15,000.00

**Scenario Cost/Unit:** $0.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Insulation, Fiberglass or cellulose, R-15 | 1196 | Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install. | Square Feet | $0.75 | 20000 | $15,000.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #2 - Building Envelope - Wall Insulation with Foam Insulation

**Scenario Description:**

Enclose both sidewalls and endwalls from ceiling to floor with closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs/cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs/cu.ft. or higher density 1/8" thick foam, or treated lumber). Installation also includes a thermal and ignition barrier intumescent coating or equivalent per NI_210-301. Payment includes materials, equipment and labor to install.

**Before Situation:**

An agriculture house with an inefficient building envelope with limited wall insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, insulation in a 40' x 400' livestock building. 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. Associated practices/activities: may include 122-AgEMP - HQ, 670-Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Area of Wall Insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 7,200.0

**Scenario Total Cost:** $21,888.00

**Scenario Cost/Unit:** $3.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Insulation, polyurethane, R-7, with sheathing skirt | 1198 | Closed-cell polyurethane foam insulation (minimum 1 inch thickness (R-7) with a protective sheeting barrier on lower 2 feet of wall height. Includes materials, equipment and labor to install. | Square Feet | $2.14 | 7200 | $15,408.00 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $0.90 | 7200 | $6,480.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #3 - Building Envelope - Sealant

**Scenario Description:**

Seal the gaps between walls, gables, ceiling, etc. in a poultry house or greenhouse. Payment includes materials, equipment and labor performed by a professional contractor.

**Before Situation:**

An agricultural facility with an inefficient building envelope with gaps between walls, ceiling, etc. for a total of 2400 linear feet.

**After Situation:**

A more effective and efficient building envelope can be created through interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. The sealant reduces seasonal heat loss and heat gain due to infiltration which reduces the respective need for heating and cooling equipment to operate. The unit basis of payment in this scenario is each house based on 60' x 500' poultry house with an assumed need of sealant to seal 2400 linear feet of gap. 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. Associated practices/activities: may include 122-AgEMP - HQ, 670-Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Perimeter of heated structure

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,400.0

**Scenario Total Cost:** $3,984.00

**Scenario Cost/Unit:** $1.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Sealant | 1150 | Greenhouse and building gap sealant. Performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Includes materials, equipment and labor to install. | Feet | $1.66 | 2400 | $3,984.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #4 - Building Envelope - Greenhouse Screens

**Scenario Description:**

Installation of a mechanical energy screen system associated with a greenhouse consisting of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control solar heat gain and heat transfer during night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use. Payment includes materials and labor to install.

**Before Situation:**

Heating and cooling of an existing greenhouse, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent requirements can also reduce efficiency.

**After Situation:**

The greenhouse is fitted with a mechanically controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss in the greenhouse. 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. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Area of Screen

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 25,000.0

**Scenario Total Cost:** $57,503.84

**Scenario Cost/Unit:** $2.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Thermal blanket 10,001 - 50,000 square foot | 1148 | Thermal blanket greenhouse screens: mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven. Size Range is 10,001 to 50,000 square feet. Materials only. | Square Feet | $2.28 | 25000 | $57,000.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #5 - Building Envelope - Greenhouse Unglazed Wall Insulation

**Scenario Description:**

Installation of insulation in greenhouse to address energy loss. The insulation can be either of the cellouse or bubble type (or equivalent). The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate. Payment includes materials and labor to install.

**Before Situation:**

Green house with standard glazing, plastic or polycarbonate walls and no insulation. Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss.

**After Situation:**

The greenhouse is fitted with insulation installed truss-to-truss or gutter-to-gutter and/or non glazed endwalls and/or sidewalls, reducing heat loss and gain in the greenhouse. 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. Associated practices/activities: may include 122-AgEMP - HQ, 670- Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Square Feet of insulation

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 25,000.0

**Scenario Total Cost:** $8,253.84

**Scenario Cost/Unit:** $0.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Insulation, Greenhouse, Reflective Bubble | 2410 | Double bubble reflective insulation with aluminum foil on both sides. Includes materials and shipping only. | Square Feet | $0.31 | 25000 | $7,750.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #6 - Building Envelope - Insulated Door Upgrade

**Scenario Description:**

Replace an existing door with an insulated door, such as but not limited to a steel roll up door in a poultry building. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate. Payment includes materials and labor to install.

**Before Situation:**

Agriculture building's existing door is inefficient

**After Situation:**

A 20 guage 12' x 12' rolling service insulated steel door is installed as a replacement for an existing less efficient door on a poultry building. 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. Associated practices/activities may include: 122-AgEMP - HQ, 670-Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Square foot

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 144.0

**Scenario Total Cost:** $1,871.92

**Scenario Cost/Unit:** $13.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Door, Insulated, Roll-up | 2392 | Rolling service insulated steel door, 20 gauge. Includes hardware required to install. Used to replace non insulated door in buildings. Materials only. | Square Feet | $11.25 | 144 | $1,620.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #7 - Building Envelope - Insulated Curtain Upgrade

**Scenario Description:**

Replacement of an existing non-insulated curtain with a seven layer insulated curtain with an R- value of 3 for a livestock building. The curtain's two outer layers are vinyl and polyethylene and the five inner layers are composed of insulating materials with air trapping fibers and a vapor barrier. Payment includes curtain and labor to install. Payment does not includes mounting accessories because the scenario assumes the curtain is replacing a non-insulated curtain.

**Before Situation:**

Existing livestock curtain is inefficient.

**After Situation:**

A 7 layer insulated curtain is installed as a replacement for an existing less efficient curtain on a livestock building. 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. Associated practices/activities may include: 122-AgEMP - HQ, 670- Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Square Foot

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,080.0

**Scenario Total Cost:** $2,771.84

**Scenario Cost/Unit:** $2.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 16 | $503.84 |
| **Materials** | | | | | | |
| Curtain , 7-Layer, R3 Insulated | 2427 | Seven layer insulated curtain with an R-value of 3 for a livestock building. Typical curtain size is 4' x 270'. The curtain's two outer layers are vinyl and polyethylene and the five inner layers are composed of insulating materials with air trapping fibers and a vapor barrier. Does not include mounting accessories, assumes it is replacing a non-insulated curtain. | Square Feet | $2.10 | 1080 | $2,268.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #8 - Building Envelope - Curtain Wall Conversion

**Scenario Description:**

Converting part or all of a curtain wall to solid insulated wall by installation of an insulated metal cover in a livestock building. Payment includes materials and labor for the installation of a weather proof exterior such as, but not limited to, corrugated steel, and insulation such as, but not limited to polyurethane R-7. Payment does not include upgrade to ventilation.

**Before Situation:**

Existing livestock curtain is inefficient.

**After Situation:**

An insualted metal wall is installed as a replacement for an existing less efficient curtain on a livestock building. Conversion is for an building that requires 3040 sq ft of wall to replace the curtains. 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. Associated practices/activities may include: 122-AgEMP - HQ, 670- Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Square Foot

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,040.0

**Scenario Total Cost:** $11,829.80

**Scenario Cost/Unit:** $3.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 30 | $733.80 |
| **Materials** | | | | | | |
| Corrugated Steel, 28 gauge | 223 | Corrugated or ribbed, galvanized, 28 gauge, includes fasteners, materials only. | Square Feet | $1.51 | 3040 | $4,590.40 |
| Insulation, polyurethane, R-7, with sheathing skirt | 1198 | Closed-cell polyurethane foam insulation (minimum 1 inch thickness (R-7) with a protective sheeting barrier on lower 2 feet of wall height. Includes materials, equipment and labor to install. | Square Feet | $2.14 | 3040 | $6,505.60 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario:** #81 - Building Envelope - Wall Insulation with Fiberglass Batt Insulation

**Scenario Description:**

Enclose both sidewalls and endwalls from ceiling to floor with 3.5" fiberglass batts (R-11), vapor barrier, and interior plywood or OSB sheathing. Payment includes materials, equipment and labor to install.

**Before Situation:**

An agriculture house with an inefficient building envelope with limited wall insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, insulation in a 40' x 400' livestock building. 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. Associated practices/activities: may include 122-AgEMP - HQ, 670-Lighting System Improvement, and 374-Farmstead Energy Improvement.

**Feature Measure:** Area of wall insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 7,200.0

**Scenario Total Cost:** $15,052.02

**Scenario Cost/Unit:** $2.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 48 | $1,511.52 |
| **Materials** | | | | | | |
| Insulation, Fiberglass or cellulose, R-15 | 1196 | Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install. | Square Feet | $0.75 | 7200 | $5,400.00 |
| Plywood, 3/4 inch, treated | 2363 | Treated 4' x 8' sheets of 3/4 inch exterior grade plywood | Each | $36.18 | 225 | $8,140.50 |

**Practice:** B000BFF1 - Buffer Bundle#1

**Scenario:** #1 - Buffer Bundle#1

**Scenario Description:**
Addresses water quality degradation, degraded plant condition, fish/wildlife inadequate habitat, and/or air quality impacts.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $7,970.16

**Scenario Cost/Unit:** $2,656.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 7 | $39.76 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 6 | $135.72 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 10 | $207.00 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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. | Hours | $11.47 | 10 | $114.70 |
| 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. | Hours | $5.83 | 6 | $34.98 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1.23 | $396.17 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1.08 | $351.60 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.69 | $100.15 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 6 | $151.32 |
| 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. | Hours | $41.94 | 6 | $251.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **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. | Acres | $9.21 | 5 | $46.05 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 5 | $54.80 |
| 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 shipping only. | Acres | $1.51 | 5 | $7.55 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 341 | $480.81 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 2518 | $3,827.36 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 1 | $47.95 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 1 | $258.50 |
| **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 | $168.33 | 2 | $336.66 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** B000CPL10 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

**Scenario:** #5 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

**Scenario Description:**
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $13,248.96

**Scenario Cost/Unit:** $132.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 30 | $710.10 |
| **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. | Hours | $31.49 | 19 | $598.31 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 41 | $3,961.01 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| 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 | $579.54 | 3 | $1,738.62 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,577.29 | 1 | $1,577.29 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** B000CPL11 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

**Scenario:** #3 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

**Scenario Description:**
Addresses water quality degradation, insufficient water, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,603.22

**Scenario Cost/Unit:** $56.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 41 | $1,291.09 |
| 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. | Hours | $41.94 | 24 | $1,006.56 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |

**Practice:** B000CPL12 - Non-Irrigated Precision Ag (MRBI)

**Scenario:** #3 - Non-Irrigated Precision Ag (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil quality, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,542.18

**Scenario Cost/Unit:** $35.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $7.58 | 100 | $758.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **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. | Hours | $31.49 | 1 | $31.49 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 9 | $869.49 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 35 | $411.60 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |

**Practice:** B000CPL13 - Non-Irrigated Cropland (MRBI)

**Scenario:** #3 - Non-Irrigated Cropland (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil quality, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,424.84

**Scenario Cost/Unit:** $44.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 11 | $346.39 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 10 | $966.10 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |

**Practice:** B000CPL14 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

**Scenario:** #3 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

**Scenario Description:**
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $12,019.81

**Scenario Cost/Unit:** $120.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 30 | $710.10 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **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. | Hours | $31.49 | 19 | $598.31 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 41 | $3,961.01 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 35 | $411.60 |
| 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 | $579.54 | 3 | $1,738.62 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,577.29 | 1 | $1,577.29 |
| Weather Station, Advanced | 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 | $811.13 | 1 | $811.13 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** B000CPL15 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

**Scenario:** #3 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

**Scenario Description:**
Addresses water quality degradation, insufficient water, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,374.07

**Scenario Cost/Unit:** $43.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **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. | Hours | $31.49 | 41 | $1,291.09 |
| 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. | Hours | $41.94 | 24 | $1,006.56 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 35 | $411.60 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |

**Practice:** B000CPL16 - Non-Irrigated Cropland with Water Bodies (MRBI)

**Scenario:** #3 - Non-Irrigated Cropland with Water Bodies (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil erosion, and soil quality

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,254.35

**Scenario Cost/Unit:** $52.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 2 | $42.68 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $31.49 | 11 | $346.39 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 9 | $869.49 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 2 | $84.14 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 2 | $222.66 |

**Practice:** B000CPL17 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

**Scenario:** #3 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil erosion, and soil quality

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $8,516.04

**Scenario Cost/Unit:** $85.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 18 | $426.06 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2 | $98.74 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| 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. | Hours | $11.47 | 16 | $183.52 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $31.49 | 11 | $346.39 |
| 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. | Hours | $24.46 | 18 | $440.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 9 | $869.49 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| 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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 872 | $1,325.44 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 100 | $422.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 100 | $166.00 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** B000CPL18 - Crop Bundle #18 - Precision Ag

**Scenario:** #3 - Crop Bundle #18 - Precision Ag

**Scenario Description:**
Addresses water quality degradation, fish and wildlife inadequate habitat, air quality impairment, and either soil erosion or soil quality degradation resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,622.28

**Scenario Cost/Unit:** $36.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $7.58 | 100 | $758.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.17 | $54.76 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.17 | $55.35 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.17 | $24.67 |
| **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. | Hours | $31.49 | 1 | $31.49 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 8 | $772.88 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 35 | $411.60 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |

**Practice:** B000CPL19 - Crop Bundle #19 - Soil Health Precision Ag

**Scenario:** #3 - Crop Bundle #19 - Soil Health Precision Ag

**Scenario Description:**
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,567.01

**Scenario Cost/Unit:** $35.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $7.58 | 100 | $758.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 13 | $1,255.93 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 35 | $411.60 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 1 | $258.50 |

**Practice:** B000CPL20 - Crop Bundle #20 - Soil Health Assessment

**Scenario:** #3 - Crop Bundle #20 - Soil Health Assessment

**Scenario Description:**
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,819.29

**Scenario Cost/Unit:** $48.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 12 | $377.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 16 | $1,545.76 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 15 | $176.40 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 1 | $258.50 |

**Practice:** B000CPL21 - Crop Bundle #21 - Crop Bundle (Organic)

**Scenario:** #3 - Crop Bundle #21 - Crop Bundle (Organic)

**Scenario Description:**
Addresses soil quality degradation, water quality degradation, and degraded plant condition resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $6,550.87

**Scenario Cost/Unit:** $65.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 10 | $236.70 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 10 | $207.00 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| 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. | Hours | $11.47 | 10 | $114.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $31.49 | 10 | $314.90 |
| 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. | Hours | $24.46 | 10 | $244.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 9 | $869.49 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| 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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 341 | $480.81 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 340 | $516.80 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 1 | $47.95 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** B000CPL22 - Crop Bundle #22 - Erosion Bundle (Organic)

**Scenario:** #3 - Crop Bundle #22 - Erosion Bundle (Organic)

**Scenario Description:**
Addresses soil quality degradation, water quality degradation, soil erosion, and fish and wildlife inadequate habitat resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,132.76

**Scenario Cost/Unit:** $51.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 13 | $409.37 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 14 | $1,352.54 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 1 | $258.50 |

**Practice:** B000CPL23 - Crop Bundle #23 - Pheasant and quail habitat

**Scenario:** #13 - Crop Bundle #23 - Pheasant and quail habitat

**Scenario Description:**
Addresses wildlife inadequate habitat, water quality degradation and/or air quality impacts, and soil health and/or degraded plant condition.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

**After Situation:**
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acres where the bundle is impleme

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,093.00

**Scenario Cost/Unit:** $52.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 2 | $48.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 1 | $258.50 |

**Practice:** B000CPL24 - Crop Bundle #24 - Cropland Soil Health Management System

**Scenario:** #3 - Crop Bundle #24- Cropland Soil Health Management System

**Scenario Description:**
Addresses soil health, water quality (or water quality and air quality), and either soil erosion, soil compaction, or plant pest pressure.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

**After Situation:**
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,108.09

**Scenario Cost/Unit:** $41.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 14 | $1,352.54 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $115.91 | 2 | $231.82 |

**Practice:** B000FST1 - Forest Bundle#1

**Scenario:** #1 - Forest Bundle#1

**Scenario Description:**
Addresses forest management on sites that are not adapted to natural fire disturbances. Addresses resouce concerns air quality impacts, degraded plant condition and fish/wildlife inadequate habitat.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 111.0

**Scenario Total Cost:** $9,767.81

**Scenario Cost/Unit:** $88.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 45 | $315.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 15 | $355.05 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| 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. | Hours | $70.17 | 41 | $2,876.97 |
| 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. | Hours | $11.47 | 11 | $126.17 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **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. | Hours | $31.49 | 7 | $220.43 |
| 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. | Hours | $24.46 | 49 | $1,198.54 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 12 | $1,159.32 |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $76.26 | 17 | $1,296.42 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 20 | $175.60 |
| 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. | Acres | $9.21 | 1 | $9.21 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 21 | $381.57 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 605 | $853.05 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 218 | $331.36 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** B000GRZ1 - Grazing Bundle 1 - Range and Pasture

**Scenario:** #3 - Grazing Bundle 1 - Range and Pasture

**Scenario Description:**
This bundle addresses soil erosion, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528L, E315A, and E645A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $3,309.31

**Scenario Cost/Unit:** $82.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 24 | $568.08 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 24 | $258.00 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 10 | $191.90 |
| **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. | Hours | $24.46 | 58 | $1,418.68 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 1 | $49.95 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** B000GRZ2 - Grazing Bundle 2 - Range and Pasture

**Scenario:** #3 - Grazing Bundle 2 - Range and Pasture

**Scenario Description:**
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E382A, and E580A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.5

**Scenario Total Cost:** $7,332.86

**Scenario Cost/Unit:** $2,095.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 5 | $62.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 13 | $307.71 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 5 | $113.10 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 9 | $186.30 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 8 | $86.00 |
| 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. | Hours | $11.47 | 8 | $91.76 |
| **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. | Hours | $24.46 | 81 | $1,981.26 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $69.11 | 4 | $276.44 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 20 | $142.80 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $16.70 | 8 | $133.60 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 90 | $491.40 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.19 | 1320 | $250.80 |
| Vinyl Undersill Strips | 241 | Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only. | Feet | $0.07 | 2000 | $140.00 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $174.17 | 2 | $348.34 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 65 | $416.65 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 65 | $505.70 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 65 | $371.15 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.02 | 65 | $66.30 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials only. | Each | $2.05 | 65 | $133.25 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 65 | $274.30 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 195 | $323.70 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** B000GRZ3 - Grazing Bundle 3 - Range and Pasture

**Scenario:** #3 - Grazing Bundle 3 - Range and Pasture

**Scenario Description:**
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E390B, and E580A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 6.0

**Scenario Total Cost:** $8,488.12

**Scenario Cost/Unit:** $1,414.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 5 | $62.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 13 | $307.71 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 4 | $22.72 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 2 | $42.68 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 5 | $113.10 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 8 | $165.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 8 | $86.00 |
| 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. | Hours | $11.47 | 8 | $91.76 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $24.46 | 81 | $1,981.26 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 5 | $126.10 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $69.11 | 4 | $276.44 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 20 | $142.80 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $16.70 | 8 | $133.60 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 90 | $491.40 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.19 | 1320 | $250.80 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 4 | $168.28 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $174.17 | 2 | $348.34 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 65 | $416.65 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 65 | $505.70 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 65 | $371.15 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.02 | 65 | $66.30 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials only. | Each | $2.05 | 65 | $133.25 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 65 | $274.30 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 195 | $323.70 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 2 | $517.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** B000GRZ4 - Grazing Bundle 4 - Range and Pasture

**Scenario:** #3 - Grazing Bundle 4 - Range and Pasture

**Scenario Description:**
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E391C, and E580A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $10,806.93

**Scenario Cost/Unit:** $2,701.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 5 | $62.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 29 | $686.43 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2 | $98.74 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 9 | $203.58 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 8 | $165.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 8 | $86.00 |
| 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. | Hours | $11.47 | 24 | $275.28 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $24.46 | 99 | $2,421.54 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 9 | $226.98 |
| 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. | Hours | $41.94 | 12 | $503.28 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $69.11 | 4 | $276.44 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $7.14 | 20 | $142.80 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $16.70 | 8 | $133.60 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $5.46 | 90 | $491.40 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.19 | 1320 | $250.80 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $174.17 | 2 | $348.34 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 872 | $1,325.44 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 65 | $416.65 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 65 | $371.15 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.02 | 65 | $66.30 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials only. | Each | $2.05 | 65 | $133.25 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 165 | $696.30 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 295 | $489.70 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** B000GRZ5 - Grazing Bundle 5 - Range and Pasture

**Scenario:** #3 - Grazing Bundle 5 - Range and Pasture

**Scenario Description:**
This bundle addresses livestock production limitation, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528A, E315A, and E645A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,050.0

**Scenario Total Cost:** $5,756.29

**Scenario Cost/Unit:** $5.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 28 | $662.76 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 12 | $248.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 24 | $258.00 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 36 | $690.84 |
| **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. | Hours | $24.46 | 65 | $1,589.90 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 12 | $1,159.32 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 1 | $49.95 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** B000PST5 - Pasture Bundle 5

**Scenario:** #3 - Pasture Bundle #5

**Scenario Description:**
Implementation of site specific strategies applied to range or pasture land uses through adoption of the following CSP enhancements: E528J, E315A, and E645A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion or Water Quality Degradation, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 60.0

**Scenario Total Cost:** $3,563.77

**Scenario Cost/Unit:** $59.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 24 | $568.08 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 6 | $124.20 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 24 | $258.00 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 6 | $115.14 |
| **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. | Hours | $24.46 | 56 | $1,369.76 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 4 | $199.80 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario:** #3 - CSP EAP Cropland and Farmstead

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land uses cropland and farmstead.

**Before Situation:**

Producer implements conservation activities on cropland or farmstead to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7.50

**Scenario Cost/Unit:** $7.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Cropland/Farmstead | 2737 | Existing Activity Payment for Cropland or Farmstead land use. | Acres | $7.50 | 1 | $7.50 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario:** #13 - CSP EAP Pasture

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use pasture.

**Before Situation:**

Producer implements conservation activities on pasture to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3.00

**Scenario Cost/Unit:** $3.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Pasture | 2738 | Existing Activity Payment for Pasture land use. | Acres | $3.00 | 1 | $3.00 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario:** #26 - CSP EAP Range

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use range.

**Before Situation:**

Producer implements conservation activities on range to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1.00

**Scenario Cost/Unit:** $1.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Range | 2739 | Existing Activity Payment for Range land use. | Acres | $1.00 | 1 | $1.00 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario:** #42 - CSP EAP NIPF

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land uses non-industrial private forest land (NIPF).

**Before Situation:**

Producer implements conservation activities on NIPF to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $0.50

**Scenario Cost/Unit:** $0.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Non-Industrial Private Forestland (NIPF) | 2740 | Existing Activity Payment for Non-Industrial Private Forestland (NIPF). | Acres | $0.50 | 1 | $0.50 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario:** #58 - CSP EAP AAL

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use associated agricultural land (AAL).

**Before Situation:**

Producer implements conservation activities on AAL to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $0.50

**Scenario Cost/Unit:** $0.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Associated Agricultural Land (AAL) | 2741 | Existing Activity Payment for Associated Agricultural Land (AAL) | Acres | $0.50 | 1 | $0.50 |

**Practice:** E300EAP2 - Existing Activity Payment-Resource Concern

**Scenario:** #3 - CSP EAP RC met at time of enrollment

**Scenario Description:**

This existing activity payment component (EAP2) provides a CSP participant with a payment for existing stewardship specific to the number of resource concerns met at the time of enrollment.

**Before Situation:**

Producer implements conservation activities across all land uses included in the operation to meet a minimum of two resource concerns at the time of enrollment.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the resource concerns met at the time of enrollment.

**Feature Measure:** Resource Concern Met

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $300.00

**Scenario Cost/Unit:** $300.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Resource Concern | 2742 | Existing Activity Payment for Resource Concern(s). | Number | $300.00 | 1 | $300.00 |

**Practice:** E300GCI - Grassland Conservation Initiative

**Scenario:** #3 - Grassland Conservation Initiative Activity

**Scenario Description:**

The Grassland Conservation Initiative Activity assists producers in protecting grazing uses; conserving and improving soil, water, and wildlife resources; and achieving related conservation values by conserving eligible land through grassland conservation contracts. Producers participating in the GCI must agree to meet or exceed planning criteria for at least one of the priority resource concerns: Soil Erosion, Soil Quality Degradation, Water Quality Degradation, Fish and Wildlife Habitat Improvement, Air Quality Impacts, Degraded Plant Condition, and/or Livestock Production Limitation.

**Before Situation:**

Eligible base acres have been maintained and reported as grass, idle, or fallow for all years between January 2009 and December 2017.

**After Situation:**

Through participation in the GCI, the producer will meet or exceed the planning criteria for at least one priority resource concern by managing the enrolled land to maintain grassland values even if the producer chooses to plant a crop on the enrolled acres.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $18.00

**Scenario Cost/Unit:** $18.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Grassland Conservation Initiative - Labor | 2736 | Labor to assist producers protect grazing uses through grassland conservation contracts. | Acres | $18.00 | 1 | $18.00 |

**Practice:** E314A - Brush management to improve wildlife habitat

**Scenario:** #1 - Brush management to improve wildlife habitat

**Scenario Description:**

Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. It will be designed to provide plant structure, density and diversity needed to meet those habitat objectives. This enhancement does not apply to removal of woody vegetation by prescribed fire or removal of woody vegetation to facilitate a land use change.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 314 - Brush Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 314 - Brush Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,682.73

**Scenario Cost/Unit:** $16.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 12 | $230.28 |
| **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. | Hours | $31.49 | 32 | $1,007.68 |
| 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. | Hours | $41.94 | 8 | $335.52 |

**Practice:** E315A - Herbaceous weed treatment to create plant communities consistent with the ecological site

**Scenario:** #1 - Herbaceous weed treatment to create plant communities consistent with the ecological site

**Scenario Description:**

Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $140.34

**Scenario Cost/Unit:** $14.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $70.17 | 2 | $140.34 |

**Practice:** E327A - Conservation cover for pollinators and beneficial insects

**Scenario:** #1 - Conservation cover for pollinators and beneficial insects

**Scenario Description:**

Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, grassed waterways, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $147.40

**Scenario Cost/Unit:** $147.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $115.91 | 1 | $115.91 |

**Practice:** E327B - Establish Monarch butterfly habitat

**Scenario:** #1 - Establish Monarch butterfly habitat

**Scenario Description:**
Seed or plug milkweed (Asclepias spp.), and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips, and similar areas.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $837.48

**Scenario Cost/Unit:** $837.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 1 | $49.37 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $458.78 | 1 | $458.78 |

**Practice:** E328A - Resource conserving crop rotation

**Scenario:** #1 - Resource conserving crop rotation

**Scenario Description:**

Establish a Resource Conserving Crop Rotation. Rotation must include AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,352.54

**Scenario Cost/Unit:** $13.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 14 | $1,352.54 |

**Practice:** E328B - Improved resource conserving crop rotation

**Scenario:** #1 - Improved resource conserving crop rotation

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. Must enrich an existing rotation which already includes AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $483.05

**Scenario Cost/Unit:** $4.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |

**Practice:** E328C - Conservation crop rotation on recently converted CRP grass/legume cover

**Scenario:** #1 - Conservation crop rotation on recently converted CRP grass/legume cover for water erosion

**Scenario Description:**

Implement a crop rotation management system on crop land acres that have recently converted from CRP grass/legume conservation cover to annual planted crops. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 and reduces soil erosion from water or wind to below soil tolerance (T) level. The current NRCS wind and water erosion prediction technologies must be used to document the rotation, soil erosion estimate, and STIR calculations. *This enhancement is limited to acres where the conversion event took place not more than 2 years prior. Enhancement not applicable on hayland.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E328D - Leave standing grain crops unharvested to benefit wildlife

**Scenario:** #1 - Leave standing grain crops unharvested to benefit wildlife

**Scenario Description:**
Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $176.71

**Scenario Cost/Unit:** $4.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.17 | $54.76 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.17 | $55.35 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.17 | $24.67 |
| **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. | Hours | $41.94 | 1 | $41.94 |

**Practice:** E328E - Soil health crop rotation

**Scenario:** #1 - Soil health crop rotation

**Scenario Description:**

Implement a crop rotation which addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. The rotation will include at least 4 different crop and/or cover crop types (crop types include cool season grass, warm season grass, cool season broadleaf, warm season broadleaf) grown in a sequence that will produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $483.05

**Scenario Cost/Unit:** $4.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |

**Practice:** E328F - Modifications to improve soil health and increase soil organic matter

**Scenario:** #1 - Modifications to improve soil health and increase soil organic matter

**Scenario Description:**

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $212.52

**Scenario Cost/Unit:** $2.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $115.91 | 1 | $115.91 |

**Practice:** E328G - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

**Scenario:** #1 - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

**Scenario Description:**

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $483.05

**Scenario Cost/Unit:** $4.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |

**Practice:** E328I - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

**Scenario:** #1 - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

**Scenario Description:**

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acres of Cropland with New Crop R

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $445.24

**Scenario Cost/Unit:** $4.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 5 | $58.80 |

**Practice:** E328J - Improved crop rotation to provide benefits to pollinators

**Scenario:** #1 - Improved crop rotation to provide benefits to pollinators

**Scenario Description:**

Improve the existing crop rotation by adding pollinator friendly crops into the rotation. The crop rotation shall include a minimum of three different crops in a minimum five year crop rotation. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides is limited for the pollinator friendly crop.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acres planted to pollinator rotation

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $77.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E328K - Multiple crop types to benefit wildlife

**Scenario:** #3 - Multiple crop types to benefit wildlife

**Scenario Description:**

Alternating crops in a systematic arrangement of strips across a field to provide diverse rotations of crops that provide wildlife food. At least two crops will be planted in adjacent strips a minimum of 0.5 acres in size.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 328 - Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 328 - Conservation Crop Rotation.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $96.61

**Scenario Cost/Unit:** $4.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |

**Practice:** E328L - Leaving tall crop residue for wildlife

**Scenario:** #3 - Leaving tall crop residue for wildlife

**Scenario Description:**

Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**Feature Measure:** acres with small grain stubble/resid

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $9.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E328M - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

**Scenario:** #19 - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

**Scenario Description:**

Diversify the existing crop rotation by adding canola or sunflower into the rotation. Canola or sunflower must be planted on a minimum of 5% of cropland acres. Pesticide use is limited to pre-bloom or bloom and in accordance with IPM and industry best management practices.

**Before Situation:**

Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $9.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E329A - No till to reduce soil erosion

**Scenario:** #1 - No till to reduce soil erosion

**Scenario Description:**

Establish no till system to reduce sheet and rill erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E329B - No till to reduce tillage induced particulate matter

**Scenario:** #1 - No till to reduce tillage induced particulate matter

**Scenario Description:**

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E329C - No till to increase plant-available moisture

**Scenario:** #1 - No till to increase plant-available moisture

**Scenario Description:**

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E329D - No till system to increase soil health and soil organic matter content

**Scenario:** #1 - No till system to increase soil health and soil organic matter content

**Scenario Description:**

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $3.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E329E - No till to reduce energy

**Scenario:** #1 - No till to reduce energy

**Scenario Description:**

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $3.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E338A - Strategically planned, patch burning for grazing distribution and wildlife habitat

**Scenario:** #1 - Strategically planned, patch burning for grazing distribution and wildlife habitat

**Scenario Description:**

Patch burn grazing is the application of prescribed fires on portions of an identified grazing unit at different times of the year. Patch burn grazing allows grazing animals to select where they want to graze creating a mosaic of vegetation structures and diversity that will maintain or enhance the wildlife habitat desired for the identified wildlife species and maintain livestock production.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $730.87

**Scenario Cost/Unit:** $7.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $102.63 | 4 | $410.52 |
| **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. | Hours | $24.46 | 2 | $48.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 4 | $120.24 |
| 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. | Hours | $41.94 | 1 | $41.94 |

**Practice:** E338B - Short-interval burns to promote a healthy herbaceous plant community

**Scenario:** #1 - Short-interval burns to promote a healthy herbaceous plant community

**Scenario Description:**

The controlled use of fire is applied in a forest to restore fire-adapted plants while improving wildlife habitat, wildlife food supply, and reducing the risk of damage from intense, severe wildfires. The ideal interval between prescribed burns is not often achieved. To improve the effectiveness of prescribed burning, the frequency of prescribed burning is increased appropriately, for a specified time period, to help restore ecological conditions in forests and woodlands. Short return interval prescribed burning is used to regenerate desirable tree species, improve the condition of fire-adapted plants and native herbaceous vegetation, improve wildlife food supply, create wildlife habitat (snags and den/cavity trees), limit encroachment of competing vegetation including non-native species, and reduce the future risk of damage from intense, severe wildfires.

**Before Situation:**

The site has a mixture of woody sprouts and some herbaceous vegetation in the forest understory.

**After Situation:**

The site has a mixture of warm season perennial vegetation and cool-season annual forages. Grazing is occurring to manage the herbaceous vegetation and keep undesirable woody vegetation from occupying the forest understory.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $3,389.68

**Scenario Cost/Unit:** $84.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 8 | $432.32 |
| Truck, water | 1448 | Water tanker truck. Equipment only. Labor not included. | Hours | $144.70 | 8 | $1,157.60 |
| **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. | Hours | $24.46 | 24 | $587.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 8 | $240.48 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E340A - Cover crop to reduce soil erosion

**Scenario:** #1 - Cover crop to reduce soil erosion

**Scenario Description:**

Cover crop added to current crop rotation to reduce soil erosion from water and wind to below soil tolerance (T) level. Cover crops grown during critical erosion period(s). Species are selected that will have physical characteristics to provide adequate erosion protection.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $683.09

**Scenario Cost/Unit:** $6.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 20 | $651.60 |

**Practice:** E340B - Intensive cover cropping to increase soil health and soil organic matter content

**Scenario:** #1 - Intensive cover cropping to increase soil health and soil organic matter content

**Scenario Description:**

Implementation of cover crop mix to provide soil coverage during ALL non-crop production periods in an annual crop rotation. Cover crop shall not be harvested or burned. Planned crop rotation including cover crops and associated management activities must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,152.22

**Scenario Cost/Unit:** $11.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E340C - Use of multi-species cover crops to improve soil health and increase soil organic matter

**Scenario:** #1 - Use of multi-species cover crops to improve soil health and increase soil organic matter

**Scenario Description:**

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increase soil organic matter. Cover crop mix must include a minimum of 4 different species. The cover crop mix will increase diversity of the crop rotation by including crop types currently missing, e.g. Cool Season Grass (CSG), Cool Season Broadleaves (CSB), Warm Season Grasses (WSG), Warm Season Broadleaves (WSB).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,021.98

**Scenario Cost/Unit:** $10.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E340D - Intensive orchard/vineyard floor cover cropping to increase soil health

**Scenario:** #1 - Intensive orchard/vineyard floor cover cropping to increase soil health

**Scenario Description:**

Implement orchard or vineyard floor cover crops. Cover crop shall not be harvested, grazed, or burned. Must achieve a soil conditioning index of zero or higher and produce a positive trend in the Organic Matter subfactor over the life of the rotation.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,021.98

**Scenario Cost/Unit:** $10.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E340E - Use of soil health assessment to assist with development of cover crop mix to improve soil health

**Scenario:** #1 - Use of soil health assessment to assist with development of cover crop mix to improve soil health

**Scenario Description:**

Soil health assessment (year 1) to evaluate current crop rotation in addressing soil organic matter depletion. Results are utilized to select a multi-species cover crop mix to add to the current crop rotation. Follow up assessment completed (year 3).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $291.96

**Scenario Cost/Unit:** $2.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 1 | $31.49 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 1 | $47.95 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $115.91 | 1 | $115.91 |

**Practice:** E340F - Cover crop to minimize soil compaction

**Scenario:** #1 - Cover crop to minimize soil compaction

**Scenario Description:**

Establish a cover crop mix that includes plants with both fibrous root and deep rooted systems. Fibrous to treat and prevent both near surface (0-4”) and deep (>4”) soil compaction and deep rooted to break up deep compacted soils. Cover crop shall not be harvested, grazed, or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $990.49

**Scenario Cost/Unit:** $9.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E340G - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

**Scenario:** #1 - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

**Scenario Description:**

Establish a cover crop mix to take up excess soil nutrients. Select cover crop species for their ability to effectively utilize nutrients. Terminate the cover crop as late as practical to maximize plant biomass production and nutrient uptake. Cover crop shall not be harvested, grazed, or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $990.49

**Scenario Cost/Unit:** $9.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 1 | $31.49 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E340H - Cover crop to suppress excessive weed pressures and break pest cycles

**Scenario:** #1 - Cover crop to suppress excessive weed pressures and break pest cycles

**Scenario Description:**

Establish a cover crop mix to suppress excessive weed pressures and break pest cycles. Select cover crop species for their life cycles, growth habits, and other biological, chemical and/or physical characteristics. Select cover crop species that do not harbor pests or diseases of subsequent crops in the rotation. Cover crop shall not be harvested, grazed, or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,021.98

**Scenario Cost/Unit:** $10.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E340I - Using cover crops for biological strip till

**Scenario:** #3 - Using cover crops for biological strip till

**Scenario Description:**

Establish alternating strips of cover crops in which one strip acts as a biological strip-tiller and the adjacent strip promotes soil health with high residue cover crops. This will facilitate planting of the subsequent cash crop into the biologically strip-tilled row without the need for mechanical disturbance.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 340 - Cover Crop.

**After Situation:**

The adoption of this enhancement will provide protection above the minimum level as described in Conservation Practice Standard 340 - Cover Crop.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,116.45

**Scenario Cost/Unit:** $11.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 5 | $157.45 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $47.95 | 20 | $959.00 |

**Practice:** E345A - Reduced tillage to reduce soil erosion

**Scenario:** #1 - Reduced tillage to reduce soil erosion

**Scenario Description:**

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $3.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E345B - Reduced tillage to reduce tillage induced particulate matter

**Scenario:** #1 - Reduced tillage to reduce tillage induced particulate matter

**Scenario Description:**

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E345C - Reduced tillage to increase plant-available moisture

**Scenario:** #1 - Reduced tillage to increase plant-available moisture

**Scenario Description:**

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E345D - Reduced tillage to increase soil health and soil organic matter content

**Scenario:** #1 - Reduced tillage to increase soil health and soil organic matter content

**Scenario Description:**

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $386.44

**Scenario Cost/Unit:** $3.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E345E - Reduced tillage to reduce energy use

**Scenario:** #1 - Reduced tillage to reduce energy use

**Scenario Description:**

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E374A - Install variable frequency drive(s) on pump(s)

**Scenario:** #1 - Install variable frequency drive(s) on pump(s)

**Scenario Description:**
Install Variable Frequency Drive(s) (VFD) on Pumping Plant (Conservation Practice Standard CPS 533) with the correct sensors, on all pumps indicated in the energy audit.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**Feature Measure:** Each

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $5,197.50

**Scenario Cost/Unit:** $103.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Variable Speed Drive, 50 HP | 1288 | Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $103.95 | 50 | $5,197.50 |

**Practice:** E374B - Switch fuel source for pump motor(s)

**Scenario:** #1 - Switch fuel source for pump motor(s)

**Scenario Description:**
Switch the fuel source for the pump motor(s) indicated in the energy audit to a renewable source (wind, solar, geothermal, etc.). (CPS 533 Pumping Plant)

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**Feature Measure:** Horsepower

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $14,468.75

**Scenario Cost/Unit:** $2,893.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| **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. | Hours | $31.49 | 12 | $377.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| 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 include the motor and controls. Includes material and shipping only. | Each | $1,019.47 | 1 | $1,019.47 |
| 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 motor will include the motor and controls. Includes material and shipping only. | Horsepower | $353.92 | 5 | $1,769.60 |
| 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 | $273.31 | 5 | $1,366.55 |
| 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 | $2,429.59 | 4 | $9,718.36 |

**Practice:** E376A - Modify field operations to reduce particulate matter

**Scenario:** #1 - Modify field operations to reduce particulate matter

**Scenario Description:**
Modify tillage and/or harvest operations to reduce particulates by at least 20 percent below the required levels.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $289.83

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E381A - Silvopasture to improve wildlife habitat

**Scenario:** #1 - Silvopasture to improve wildlife habitat

**Scenario Description:**
Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 381 - Silvopasture

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 381 - Silvopasture

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $7,534.64

**Scenario Cost/Unit:** $75.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 20 | $113.60 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 200 | $3,838.00 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **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. | Acres | $9.21 | 20 | $184.20 |
| Shrub, Seedling, Large | 1508 | Bare root shrub seedling, 36 to 60 inches tall; includes tropical containerized seedlings larger than 20 cubic inches. Includes materials and shipping only. | Each | $2.82 | 200 | $564.00 |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.33 | 100 | $133.00 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 20 | $2,226.60 |

**Practice:** E386A - Enhanced field borders to reduce soil erosion along the edge(s) of a field

**Scenario:** #1 - Enhanced field borders to reduce soil erosion along the edge(s) of a field

**Scenario Description:**
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover along the edge(s) of the field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $622.76

**Scenario Cost/Unit:** $622.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2748 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $43.92 | 1 | $43.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E386B - Enhanced field borders to increase carbon storage along the edge(s) of the field

**Scenario:** #1 - Enhanced field borders to increase carbon storage along the edge(s) of the field

**Scenario Description:**
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover and dense rooting system along the edge(s) of the field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $702.29

**Scenario Cost/Unit:** $702.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $123.45 | 1 | $123.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E386C - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

**Scenario:** #1 - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

**Scenario Description:**
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that decrease the particulate emissions along the edge(s) of the field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $635.94

**Scenario Cost/Unit:** $635.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $57.10 | 1 | $57.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E386D - Enhanced field borders to increase food for pollinators along the edge(s) of a field

**Scenario:** #1 - Enhanced field borders to increase food for pollinators along the edge(s) of a field

**Scenario Description:**
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide food for pollinators along the edge(s) of the field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $702.29

**Scenario Cost/Unit:** $702.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $123.45 | 1 | $123.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E386E - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

**Scenario:** #1 - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

**Scenario Description:**

Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife food and habitat along the edge(s) of the field. The extended field border will also provide enhanced wildlife habitat continuity.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $702.29

**Scenario Cost/Unit:** $702.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $123.45 | 1 | $123.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E390A - Increase riparian herbaceous cover width for sediment and nutrient reduction

**Scenario:** #1 - Increase riparian herbaceous cover width for sediment and nutrient reduction

**Scenario Description:**

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $1,021.56

**Scenario Cost/Unit:** $510.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 2 | $42.68 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 2 | $84.14 |
| Native Perennial Grasses, Medium Density | 2751 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $159.05 | 2 | $318.10 |

**Practice:** E390B - Increase riparian herbaceous cover width to enhance wildlife habitat

**Scenario:** #1 - Increase riparian herbaceous cover width to enhance wildlife habitat

**Scenario Description:**

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $1,465.09

**Scenario Cost/Unit:** $366.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 4 | $22.72 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 2 | $42.68 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 1 | $322.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 1 | $325.56 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 4 | $168.28 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 2 | $517.00 |

**Practice:** E391A - Increase riparian forest buffer width for sediment and nutrient reduction

**Scenario:** #1 - Increase riparian forest buffer width for sediment and nutrient reduction

**Scenario Description:**
Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $4,091.55

**Scenario Cost/Unit:** $2,045.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 16 | $378.72 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2 | $98.74 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| 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. | Hours | $11.47 | 16 | $183.52 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 872 | $1,325.44 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 100 | $422.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 100 | $166.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E391B - Increase stream shading for stream temperature reduction

**Scenario:** #1 - Increase stream shading for stream temperature reduction

**Scenario Description:**
Riparian area tree canopy cover density is increased and the extent of the forested riparian area is increased to provide greater stream shading.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $4,140.47

**Scenario Cost/Unit:** $2,070.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 16 | $378.72 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2 | $98.74 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| 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. | Hours | $11.47 | 16 | $183.52 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $24.46 | 18 | $440.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 872 | $1,325.44 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 100 | $422.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 100 | $166.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E391C - Increase riparian forest buffer width to enhance wildlife habitat

**Scenario:** #1 - Increase riparian forest buffer width to enhance wildlife habitat

**Scenario Description:**

Where an existing riparian forest buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock to increase the functional width of the buffer.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $4,140.47

**Scenario Cost/Unit:** $2,070.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 16 | $378.72 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2 | $98.74 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 2 | $11.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 4 | $90.48 |
| 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. | Hours | $11.47 | 16 | $183.52 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.82 | $264.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.72 | $234.40 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.46 | $66.76 |
| **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. | Hours | $24.46 | 18 | $440.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 4 | $100.88 |
| 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. | Hours | $41.94 | 4 | $167.76 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 872 | $1,325.44 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 100 | $422.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 100 | $166.00 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E393A - Extend existing filter strip to reduce water quality impacts

**Scenario:** #1 - Extend existing filter strip to reduce water quality impacts

**Scenario Description:**

Extend existing filter strips for water quality protection. Extend the existing buffer for a total of 60 feet or more to enhance water quality functions. The extended buffers must be composed of at least 5 species of non-noxious, wildlife friendly grasses and/or perennial forbs best suited to site conditions. Include species that provide pollinator food and habitat where possible.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 393 - Filter Strip

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 393 - Filter Strip

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $895.51

**Scenario Cost/Unit:** $895.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $10.40 | 1 | $10.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $8.50 | 1 | $8.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $123.45 | 1 | $123.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E395A - Stream habitat improvement through placement of woody biomass

**Scenario:** #1 - Stream habitat improvement through placement of woody biomass

**Scenario Description:**
Flexible placement of wood (unanchored/unpinned) in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species and natural stream processes.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

**Feature Measure:** Bankfull width X Length

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $18,548.63

**Scenario Cost/Unit:** $18,548.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $128.05 | 16 | $2,048.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 8 | $616.96 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $30.06 | 24 | $721.44 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yards | $29.34 | 20 | $586.80 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yards | $30.70 | 30 | $921.00 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $43.63 | 1 | $43.63 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $14.97 | 300 | $4,491.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $66.53 | 40 | $2,661.20 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.62 | 50 | $31.00 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $25.00 | 15 | $375.00 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $163.19 | 30 | $4,895.70 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.02 | 20 | $200.40 |
| **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 | $477.85 | 2 | $955.70 |

**Practice:** E399A - Fishpond management for native aquatic and terrestrial species

**Scenario:** #1 - Fishpond management for native aquatic and terrestrial species

**Scenario Description:**
Pond rehabilitation, buffer, and watershed management actions are taken to improve habitat for native species of fish, amphibians, and shorebirds.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 399 - Fishpond Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 399 - Fishpond Management

**Feature Measure:** Pond area + buffer area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $2,545.14

**Scenario Cost/Unit:** $1,272.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 1 | $21.34 |
| **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. | Hours | $31.49 | 3 | $94.47 |
| 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. | Hours | $24.46 | 32 | $782.72 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 1 | $42.07 |
| Herbicide, Diquat dibromide | 1820 | Aquatic herbicide and plant growth regulator. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Gallons | $77.35 | 1 | $77.35 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.00 | 1000 | $1,000.00 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 1 | $258.50 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E412A - Enhance a grassed waterway

**Scenario:** #3 - Waterway, reshape/extend/widen

**Scenario Description:**

Typical practice is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding will be completed under the Critical Area Planting (342) Practice Standard with seeding area up to 20% greater than waterway area to account for buffer area along the waterway. Costs include excavation and associated work to construct the overall shape and grade of the waterway. This scenario would apply to Grassed Waterways without erosion control blanket or rock checks.

**Before Situation:**

The field has a grassed waterway, but a gully cutting upstream, downstream, or adjacent to the existing grassed waterway has formed as time goes on, so the new gully needs to be stopped or controlled. The new gully has formed in field as a result of a change in runoff amounts from the original design from subsurface drainage outlets, change in cropping techniques, change in land use, etc.

**After Situation:**

An installed grassed waterway has been installed that is possibly wider or longer than the original grassed waterway that wasn't functioning properly anymore. The new installed grassed waterway is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. The practice is installed using a dozer and/or scraper, with final grading with motor grader. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606).

**Feature Measure:** Acres of Waterway reshaped, exten

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,044.91

**Scenario Cost/Unit:** $4,044.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.89 | 411 | $365.79 |
| 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 Yards | $3.71 | 954 | $3,539.34 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| 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. | Hours | $41.94 | 1 | $41.94 |

**Practice:** E449A - Complete pumping plant evaluation for water savings

**Scenario:** #1 - Complete pumping plant evaluation for water savings

**Scenario Description:**

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Evaluate to determine if a Variable Frequency Drive motor controller(s) is recommended and the simple payback in terms of energy savings is less than 10 years.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 449 – Irrigation Water Management.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $3,412.55

**Scenario Cost/Unit:** $5.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 32 | $3,091.52 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** E449I - Sprinkler Irrigation Equipment Retrofit

**Scenario:** #19 - IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation

**Scenario Description:**

This activity involves installing speed control equipment to a sprinkler irrigated field for irrigation water management. The installation of the equipment is in year one. It is applicable to sprinkler irrigation systems that do not already have the functionality and are able to integrate the speed control technology.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,375.99

**Scenario Cost/Unit:** $1,375.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| **Materials** | | | | | | |
| Center Pivot VRI, Speed Control | 2727 | Center pivot irrigation system using variable rate irrigation using speed control technology. Includes controller, sensors, GPS unit, and installation. | Number | $1,124.07 | 1 | $1,124.07 |

**Practice:** E484A - Mulching to improve soil health

**Scenario:** #1 - Mulching to improve soil health

**Scenario Description:**

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least 4 different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 - Mulching

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $193.22

**Scenario Cost/Unit:** $1.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |

**Practice:** E484B - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

**Scenario:** #1 - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

**Scenario Description:**

Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. An exception may be made when it is determined that infected material must be burned to preserve crop health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 – Mulching

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

**Feature Measure:** Actual Acres of Crop producing Wo

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $582.12

**Scenario Cost/Unit:** $14.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E484C - Mulching with natural materials in specialty crops for weed control

**Scenario:** #3 - Mulching with natural materials in specialty crops for weed control

**Scenario Description:**
Application of straw mulch or other state approved natural material (such as wood chips, compost, green chop, dry hay or sawdust) for weed control in specialty crops.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard 484 - Mulching

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 484 - Mulching

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $377.81

**Scenario Cost/Unit:** $37.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 2 | $45.24 |
| Mulcher, straw blower | 1305 | Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included. | Hours | $44.01 | 2 | $88.02 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 2 | $50.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $65.00 | 1.5 | $97.50 |

**Practice:** E511A - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

**Scenario:** #1 - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

**Scenario Description:**

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. (For species list see State Wildlife Action Plan) Conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $162.82

**Scenario Cost/Unit:** $3.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $30.49 | 1.67 | $50.92 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 2 | $48.92 |

**Practice:** E511B - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

**Scenario:** #1 - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

**Scenario Description:**

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such a way, and in time frames, to optimize both forage yield/quality and wildlife cover and shelter and/or continuity between otherwise disconnected habitats.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.69

**Scenario Cost/Unit:** $5.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 25 | $479.75 |
| **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. | Hours | $41.94 | 1 | $41.94 |

**Practice:** E511C - Forage testing for improved harvesting methods and hay quality

**Scenario:** #3 - Hay quality record keepoing for livestock producers

**Scenario Description:**

This enhancement results in participants obtaining hay samples and submitting them to a land grant university or other accredited lab for quality analysis. The participant will record data for multiple harvests and use the data to make future decisions. The participant will discuss the results with NRCS or with their cooperative extensions service. Technical recommendations are made to the participant based upon the test results.

**Before Situation:**

The participant has hay that doesn't have quality analysis or doesn't know the quality of previous hay harvests. The hay will be fed when needed.

**After Situation:**

The participant has hay with hay quality analysis. The participant records data based upon the results to reference and make future decisions. The participant has a better understanding on the quality of hay so that adjustments in feeding or supplementation can be made.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $242.67

**Scenario Cost/Unit:** $121.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 2 | $48.92 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $27.60 | 2 | $55.20 |

**Practice:** E512A - Cropland conversion to grass-based agriculture to reduce soil erosion

**Scenario:** #1 - Cropland conversion to grass-based agriculture to reduce soil erosion

**Scenario Description:**

Conversion of cropped land to grass-based agriculture to reduce soil erosion. Mixtures of perennial grasses, forbs, and legume species are established on cropland where annually-seeded cash crops have been grown.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $698.88

**Scenario Cost/Unit:** $6.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 20 | $615.00 |

**Practice:** E512B - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

**Scenario:** #1 - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide for reduced soil erosion, improving soil health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,310.48

**Scenario Cost/Unit:** $23.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 20 | $2,226.60 |

**Practice:** E512C - Cropland conversion to grass for soil organic matter improvement

**Scenario:** #1 - Cropland conversion to grass for soil organic matter improvement

**Scenario Description:**

Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,050.36

**Scenario Cost/Unit:** $10.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $24.46 | 2 | $48.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 20 | $615.00 |

**Practice:** E512D - Forage plantings that help increase organic matter in depleted soils

**Scenario:** #1 - Forage plantings that help increase organic matter in depleted soils

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can help improve soil quality of depleted sites through increase or conservation of the organic matter in the soil.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,178.63

**Scenario Cost/Unit:** $11.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 25 | $479.75 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 20 | $615.00 |

**Practice:** E512E - Forage and biomass planting that produces feedstock for biofuels or energy production.

**Scenario:** #1 - Forage and biomass planting that produces feedstock for biofuels or energy production.

**Scenario Description:**

Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,759.72

**Scenario Cost/Unit:** $57.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 50 | $5,566.50 |

**Practice:** E512F - Establishing native grass or legumes in forage base to improve the plant community

**Scenario:** #1 - Establishing native grass or legumes in forage base to improve the plant community

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,906.11

**Scenario Cost/Unit:** $19.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $180.95 | 10 | $1,809.50 |

**Practice:** E512G - Native grasses or legumes in forage base

**Scenario:** #1 - Native grasses or legumes in forage base

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,867.13

**Scenario Cost/Unit:** $28.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 25 | $2,783.25 |

**Practice:** E512H - Forage plantings that enhance bird habitat cover and shelter or structure and composition

**Scenario:** #1 - Forage plantings that enhance bird habitat cover and shelter or structure and composition

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide cover and shelter or structure and composition to bird habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,647.98

**Scenario Cost/Unit:** $26.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 2 | $62.98 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 10 | $2,585.00 |

**Practice:** E512I - Establish pollinator and/or beneficial insect and/or monarch habitat

**Scenario:** #1 - Establish pollinator and/or beneficial insect and/or monarch habitat

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies and/or pollinators and forage and other habitat values for wildlife and livestock, particularly at times when targeted nectar, forage supply and quality, cover, and shelter are not available in other pastures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,778.22

**Scenario Cost/Unit:** $27.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $258.50 | 10 | $2,585.00 |

**Practice:** E512J - Establish wildlife corridors to provide habitat continuity or access to water

**Scenario:** #1 - Establish wildlife corridors to provide habitat continuity or access to water

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide cover needed for wildlife species of concern to move from food/cover/water sources to other food/cover/water sources as needed for their life cycles, and/or to enhance the utility of underused wildlife habitat areas.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,676.93

**Scenario Cost/Unit:** $16.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 25 | $479.75 |
| **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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $111.33 | 10 | $1,113.30 |

**Practice:** E528A - Maintaining quantity and quality of forage for animal health and productivity

**Scenario:** #1 - Maintaining quantity and quality of forage for animal health and productivity

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $3,724.42

**Scenario Cost/Unit:** $3.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 12 | $248.40 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 36 | $690.84 |
| **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. | Hours | $24.46 | 17 | $415.82 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 12 | $1,159.32 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 1 | $49.95 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $46.16 | 6 | $276.96 |

**Practice:** E528B - Grazing management that improves monarch butterfly habitat

**Scenario:** #1 - Grazing management that improves monarch butterfly habitat

**Scenario Description:**
Implement a grazing management plan that will increase the abundance and diversity of monarch nectar-producing perennial forbs, including milkweed, while maintaining ecosystem benefits for other wildlife and livestock.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $915.38

**Scenario Cost/Unit:** $9.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 2.5 | $47.98 |
| **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. | Hours | $24.46 | 1 | $24.46 |
| 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. | Hours | $41.94 | 1 | $41.94 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 1 | $49.95 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 2 | $641.80 |

**Practice:** E528C - Incorporating wildlife refuge areas in contingency plans for wildlife.

**Scenario:** #1 - Incorporating wildlife refuge areas in contingency plans for wildlife.

**Scenario Description:**

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,643.32

**Scenario Cost/Unit:** $16.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 6 | $124.20 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 15 | $287.85 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 4 | $199.80 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |

**Practice:** E528D - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

**Scenario:** #1 - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

**Scenario Description:**

Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $528.65

**Scenario Cost/Unit:** $0.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **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. | Hours | $41.94 | 10 | $419.40 |

**Practice:** E528E - Improved grazing management for enhanced plant structure and composition for wildlife

**Scenario:** #1 - Improved grazing management for enhanced plant structure and composition for wildlife

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $329.79

**Scenario Cost/Unit:** $3.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 15 | $287.85 |
| **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. | Hours | $41.94 | 1 | $41.94 |

**Practice:** E528F - Stockpiling cool season forage to improve structure and composition or plant productivity and health

**Scenario:** #1 - Stockpiling cool season forage to improve structure and composition or plant productivity and health

**Scenario Description:**
Grazing management employed to stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,312.80

**Scenario Cost/Unit:** $23.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 6 | $124.20 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 10 | $191.90 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 1 | $49.95 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| 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 | $0.44 | 2000 | $880.00 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 3 | $35.28 |

**Practice:** E528G - Improved grazing management on pasture for plant productivity and health with monitoring activities

**Scenario:** #1 - Improved grazing management on pasture for plant productivity and health with monitoring activities

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $973.90

**Scenario Cost/Unit:** $9.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 30 | $575.70 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 1 | $11.76 |

**Practice:** E528I - Grazing management that protects sensitive areas -surface or ground water from nutrients

**Scenario:** #1 - Grazing management that protects sensitive areas -surface or ground water from nutrients

**Scenario Description:**
Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,736.99

**Scenario Cost/Unit:** $1.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 12 | $248.40 |
| **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. | Hours | $24.46 | 17 | $415.82 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polytape | 7 | Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only. | Each | $47.41 | 4 | $189.64 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |

**Practice:** E528J - Prescribed grazing on pastureland that improves riparian and watershed function

**Scenario:** #1 - Prescribed grazing on pastureland that improves riparian and watershed function

**Scenario Description:**
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,547.37

**Scenario Cost/Unit:** $15.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 6 | $124.20 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 10 | $191.90 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 4 | $199.80 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |

**Practice:** E528K - Improved grazing management for soil compaction on pasture through monitoring activities

**Scenario:** #1 - Improved grazing management for soil compaction on pasture through monitoring activities

**Scenario Description:**

Manage the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $760.06

**Scenario Cost/Unit:** $7.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 10 | $191.90 |
| **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. | Hours | $24.46 | 4 | $97.84 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E528L - Prescribed grazing that improves or maintains riparian and watershed function-erosion

**Scenario:** #1 - Prescribed grazing that improves or maintains riparian and watershed function-erosion

**Scenario Description:**

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,000.48

**Scenario Cost/Unit:** $10.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $19.19 | 10 | $191.90 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 1 | $49.95 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |

**Practice:** E528M - Grazing management that protects sensitive areas from gully erosion

**Scenario:** #1 - Grazing management that protects sensitive areas from gully erosion

**Scenario Description:**
Grazing management employed will provide vegetative cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations that cannot tolerate plant defoliation.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,594.76

**Scenario Cost/Unit:** $1.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 4 | $94.68 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 12 | $248.40 |
| **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. | Hours | $24.46 | 17 | $415.82 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| **Materials** | | | | | | |
| Wire, Polytape | 7 | Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only. | Each | $47.41 | 1 | $47.41 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 1 | $274.42 |

**Practice:** E528O - Clipping mature forages to set back vegetative growth for improved forage quality

**Scenario:** #3 - Clipping mature forages to set back vegetative growth for improved forage quality

**Scenario Description:**

Timely clipping of mature forages through mowing, swathing or some other mechanical cutting will occur to increase forage palatability by setting plants back to a vegetative state for improved grazing management and forage quality.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $2,803.19

**Scenario Cost/Unit:** $35.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $90.63 | 20 | $1,812.60 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 24 | $605.28 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** E528P - Implementing Bale or Swath Grazing to increase organic matter and reduce nutrients in surface water

**Scenario:** #3 - Implementing bale or swath grazing to increase organic matter or reduce nutrients in surface water

**Scenario Description:**

Bale or swath grazing to improve organic matter, aggregate stability or soil organism habitat or to reduce nutrient risks to surface water by leaving field harvested forages on site or supplementing with off-field forages. Grazing forages in this manner, will help reduce nutrient concentrations from confined animal lots while incorporating organic matter, feeding and diversifying the microbiome, building better soil aggregation and increasing soil health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,746.57

**Scenario Cost/Unit:** $137.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 20 | $473.40 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $49.78 | 20 | $995.60 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $8.02 | 20 | $160.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 40 | $1,008.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 1 | $96.61 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 1 | $11.76 |

**Practice:** E528Q - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

**Scenario:** #3 - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

**Scenario Description:**

Body condition scoring (BCS) serves as a useful management tool to monitor livestock performance with respect to current and recent feeding or grazing programs. Body condition scoring is a numeric scoring system, producers can use to consistently evaluate animals' estimated body energy reserves through degree of fatness. This information can be used to adjust nutritional strategies to reach optimal BCS. Since body condition is closely associated with reproductive performance as well as feed efficiency, monitoring body condition can help producers reach production goals and increase the operation's bottom line. Knowledge and understanding of BCS will assist producers to adjust a supplemental feeding program to maintain animal health and nutrition on a-monthly-basis.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $178.60

**Scenario Cost/Unit:** $1.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 1 | $20.70 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |

**Practice:** E528R - Management Intensive Rotational Grazing

**Scenario:** #3 - Management Intensive Rotational Grazing

**Scenario Description:**
Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,445.91

**Scenario Cost/Unit:** $34.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 10 | $207.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $24.46 | 15 | $366.90 |
| 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. | Hours | $41.94 | 2 | $83.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 6 | $579.66 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $49.95 | 2 | $99.90 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $10.70 | 3 | $32.10 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.10 | 3 | $6.30 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $45.19 | 1 | $45.19 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $320.90 | 1 | $320.90 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $274.42 | 2 | $548.84 |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $0.95 | 1000 | $950.00 |

**Practice:** E533B - Complete pumping plant evaluation for energy savings

**Scenario:** #1 - Complete pumping plant evaluation for energy savings

**Scenario Description:**

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Evaluate to determine if a Variable Frequency Drive motor controller(s) is recommended and the simple payback in terms of energy savings is less than 10 years.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $3,412.55

**Scenario Cost/Unit:** $5.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 8 | $251.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 32 | $3,091.52 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** E578A - Stream crossing elimination

**Scenario:** #1 - Stream crossing elimination

**Scenario Description:**
Existing stream crossings on an operation are consolidated into fewer crossings in order to reduce impacts to stream habitat.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 578 - Stream Crossing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 578 - Stream Crossing

**Feature Measure:** Typical feature is 0.09 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,356.28

**Scenario Cost/Unit:** $7,356.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $54.04 | 16 | $864.64 |
| 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. | Hours | $107.06 | 8 | $856.48 |
| 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. | Acres | $11.75 | 0.1 | $1.18 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $77.12 | 16 | $1,233.92 |
| **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. | Hours | $24.46 | 32 | $782.72 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 32 | $807.04 |
| 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. | Hours | $41.94 | 16 | $671.04 |
| **Materials** | | | | | | |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.32 | 300 | $396.00 |
| Tree & Shrub, Woody, Cuttings, Medium | 1308 | Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only. | Each | $0.89 | 300 | $267.00 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $25.00 | 42 | $1,050.00 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $32.58 | 0.1 | $3.26 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2748 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $43.92 | 0.1 | $4.39 |
| **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 | $168.33 | 1 | $168.33 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $250.28 | 1 | $250.28 |

**Practice:** E580A - Stream corridor bank stability improvement

**Scenario:** #1 - Stream corridor bank stability improvement

**Scenario Description:**
Stream corridor bank vegetation components are established to provide additional streambank stability.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $4,133.37

**Scenario Cost/Unit:** $2,066.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 8 | $165.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 8 | $86.00 |
| 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. | Hours | $11.47 | 8 | $91.76 |
| **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. | Hours | $24.46 | 48 | $1,174.08 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 65 | $416.65 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 65 | $505.70 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 65 | $371.15 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.02 | 65 | $66.30 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials only. | Each | $2.05 | 65 | $133.25 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 65 | $274.30 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 195 | $323.70 |

**Practice:** E580B - Stream corridor bank vegetation improvement

**Scenario:** #1 - Stream corridor bank vegetation improvement

**Scenario Description:**
Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $4,133.37

**Scenario Cost/Unit:** $2,066.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 8 | $165.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 8 | $86.00 |
| 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. | Hours | $11.47 | 8 | $91.76 |
| **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. | Hours | $24.46 | 48 | $1,174.08 |
| 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. | Hours | $41.94 | 8 | $335.52 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 65 | $416.65 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $7.78 | 65 | $505.70 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $5.71 | 65 | $371.15 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.02 | 65 | $66.30 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials only. | Each | $2.05 | 65 | $133.25 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 65 | $274.30 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.66 | 195 | $323.70 |

**Practice:** E590A - Improving nutrient uptake efficiency and reducing risk of nutrient losses

**Scenario:** #1 - Improving nutrient uptake efficiency and reducing risk of nutrient losses

**Scenario Description:**

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses to surface and groundwater and reduce risks to air quality by reducing emissions of greenhouse gases (GHGs).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,653.97

**Scenario Cost/Unit:** $26.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $24.14 | 100 | $2,414.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $9.35 | 5 | $46.75 |

**Practice:** E590B - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

**Scenario:** #1 - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

**Scenario Description:**
Precision application technology and techniques are utilized to plan and apply nutrients to improve nutrient use efficiency and reduce risk of nutrient losses.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,424.82

**Scenario Cost/Unit:** $14.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 35 | $411.60 |

**Practice:** E590C - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

**Scenario:** #3 - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

**Scenario Description:**

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 590 - Nutrient Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 590 - Nutrient Management

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,676.84

**Scenario Cost/Unit:** $16.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.20 | 100 | $820.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 40 | $470.40 |

**Practice:** E595A - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

**Scenario:** #1 - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

**Scenario Description:**

Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,047.83

**Scenario Cost/Unit:** $10.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $7.58 | 100 | $758.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E595B - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

**Scenario:** #1 - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

**Scenario Description:**

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in water and air. Reduce the potential for delivery of chemicals into water or ozone precursor emissions .

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $604.73

**Scenario Cost/Unit:** $6.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 10 | $314.90 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 3 | $289.83 |

**Practice:** E595D - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

**Scenario:** #1 - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

**Scenario Description:**

Bacillus thuringiensis (Bt) plant incorporated protectants are plants that have been genetically altered to produce proteins that are harmful to certain insect pests. Widespread implementation of Bt crops has decreased insecticide use and increased crop yields, but it must be used as part of an integrated pest management (IPM) approach to protect the crop from pest species that are not susceptible to the Bt toxin and to manage pest resistance. Crop rotation, scouting and resistance management strategies, such as planting and creating refuges of non-Bt crops, are essential when farming Bt crops. Insects have developed resistance to Bt proteins. To mitigate the development of further resistance, growers are required to plant refuges of non-transgenic crops. These refuges produce numbers of susceptible insects that will help sustain populations of non-resistant insects. The size of Refuge requirement depends on the environment, pest and strain of the crop. Size of refuge is determined by resistance risk. Most Bt corn requires that 20% of the total Bt crop planted be non-Bt. Cotton can require 50% of the crop be planted to non-Bt. A recent study published in the Journal of Integrated Pest Management revealed, compliance has been a challenge. Nearly 40% of growers surveyed did not plant the required refuge (Reisig 2017). They credit non-compliance, in part, to lack of understanding by small-scale farmers about the need for refuges.

**Before Situation:**

Minimal or no refuges were planted as required for Bt crops.

**After Situation:**

Optimum sized and located refuges are planted for Bt crops.

**Feature Measure:** Ac

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $508.12

**Scenario Cost/Unit:** $12.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $31.49 | 10 | $314.90 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |

**Practice:** E595E - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

**Scenario:** #1 - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

**Scenario Description:**

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental effect on dung beetle populations. Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest control in and on livestock along with rotational grazing and higher stock densities has shown to increase the dung beetle population. Use of natural or alternative methods of pest control over multiple years is encouraged.

**Before Situation:**

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental

**After Situation:**

Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $2,834.32

**Scenario Cost/Unit:** $5.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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 | $109.25 | 1 | $109.25 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 26 | $538.20 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $48.65 | 1 | $48.65 |
| **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. | Hours | $31.49 | 10 | $314.90 |
| 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. | Hours | $24.46 | 10 | $244.60 |
| 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. | Hours | $41.94 | 10 | $419.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 12 | $1,159.32 |

**Practice:** E612A - Cropland conversion to trees or shrubs for long term improvement of water quality

**Scenario:** #1 - Cropland conversion to trees or shrubs for long term improvement of water quality

**Scenario Description:**

Cropland conversion to trees and shrubs for long term erosion control and improvement of water quality. Trees and shrubs are established on cropland where annually-seeded cash crops have been grown. Tree and/or shrub species are selected for their efficacy in holding soil, and the planting design is configured to control runoff and trap sediment.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,604.48

**Scenario Cost/Unit:** $360.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $21.34 | 10 | $213.40 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acres | $20.27 | 10 | $202.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 4 | $1,288.36 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 4 | $1,302.24 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 2 | $290.28 |
| **Materials** | | | | | | |
| Tropical species, Medium | 1541 | Tropical seedling, native or non-native, 1 quart to gallon pot, or containerized, 10 cubic inch. Includes materials and shipping only. | Each | $0.00 | 500 | $0.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $30.75 | 10 | $307.50 |

**Practice:** E612B - Planting for high carbon sequestration rate

**Scenario:** #1 - Planting for high carbon sequestration rate

**Scenario Description:**

Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $12,173.90

**Scenario Cost/Unit:** $1,217.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 4 | $22.72 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 6 | $135.72 |
| 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. | Hours | $5.83 | 6 | $34.98 |
| **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. | Hours | $24.46 | 6 | $146.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 6 | $151.32 |
| 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. | Hours | $41.94 | 6 | $251.64 |
| **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. | Acres | $9.21 | 4 | $36.84 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 4 | $43.84 |
| 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 shipping only. | Acres | $1.51 | 3 | $4.53 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 7260 | $11,035.20 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E612C - Establishing tree/shrub species to restore native plant communities

**Scenario:** #1 - Establishing tree/shrub species to restore native plant communities

**Scenario Description:**

Establish trees and/or shrubs to restore elements of plant diversity that have been lost through past diseases or improper management. For example, disease-resistant varieties of elm and chestnut can be established to restore the ecological functions of American elm and American chestnut. At the stand level, past forest management may have eliminated certain native tree species. Restoring stand-level diversity and function addresses a wide array of resource concerns and strengthens ongoing management activities. This enhancement improves a forest that is already in good condition by increasing plant diversity, and improving health and vigor through adding plants with resistance to disease, pests, or other local hazards. Additional benefits include contributing to carbon storage, and providing diversity in wildlife habitat and food sources.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $4,660.44

**Scenario Cost/Unit:** $932.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| 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. | Hours | $11.47 | 12 | $137.64 |
| **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. | Hours | $24.46 | 12 | $293.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.41 | 50 | $320.50 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $14.60 | 100 | $1,460.00 |
| Tree, Conifer, Potted, Medium | 1537 | Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $13.76 | 100 | $1,376.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials only. | Each | $4.26 | 150 | $639.00 |

**Practice:** E612D - Adding food-producing trees and shrubs to existing plantings

**Scenario:** #1 - Adding food-producing trees and shrubs to existing plantings

**Scenario Description:**
Plant food-producing trees and shrubs for wildlife or human consumption within windbreaks, alley cropping, multi-story cropping, silvopasture systems, and/or riparian forest buffers.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,089.58

**Scenario Cost/Unit:** $208.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 10 | $207.00 |
| 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. | Hours | $11.47 | 10 | $114.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 341 | $480.81 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 340 | $516.80 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E612E - Cultural plantings

**Scenario:** #1 - Cultural plantings

**Scenario Description:**
Plant trees and shrubs that are of cultural significance, such as those species utilized by Tribes in traditional practices, medicinal plants, species used in basket-making, etc. (e.g., paper birch, slippery elm, witch hazel).

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,920.09

**Scenario Cost/Unit:** $1,920.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| 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. | Hours | $11.47 | 10 | $114.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 681 | $1,035.12 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E612F - Sugarbush management

**Scenario:** #1 - Sugarbush management

**Scenario Description:**

Establish or maintain species diversity in a sugarbush to enhance pollinator and wildlife needs. Maintain at least 20% of basal area in species other than sugar maple (Acer saccharum) to provide species diversity. Half of the trees that are not sugar maples (10%) will be mast producing species (hard or soft mass). Use maple tree tapping guidelines that minimize tree damage.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $814.46

**Scenario Cost/Unit:** $814.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 2 | $14.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| 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. | Hours | $70.17 | 1 | $70.17 |
| 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. | Hours | $11.47 | 2 | $22.94 |
| **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. | Hours | $24.46 | 10 | $244.60 |
| **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. | Acres | $9.21 | 0.5 | $4.61 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $14.60 | 20 | $292.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials only. | Each | $4.26 | 20 | $85.20 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 60 | $3.60 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.50 | 20 | $30.00 |

**Practice:** E612G - Tree/shrub planting for wildlife food

**Scenario:** #1 - Tree/shrub planting for wildlife food

**Scenario Description:**

Tree or shrub planting to enhance habitat for native wildlife. A minimum of five tree or shrub species will be used; they will be species that provide food and/or cover for identified wildlife species.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,936.98

**Scenario Cost/Unit:** $1,936.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $5.68 | 1 | $5.68 |
| 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. | Hours | $11.47 | 11 | $126.17 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $322.09 | 0.41 | $132.06 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $325.56 | 0.36 | $117.20 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $145.14 | 0.23 | $33.38 |
| **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. | Hours | $24.46 | 11 | $269.06 |
| **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. | Acres | $9.21 | 1 | $9.21 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $10.96 | 1 | $10.96 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.41 | 605 | $853.05 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.52 | 218 | $331.36 |

**Practice:** E643B - Restoration and management of rare or declining habitat

**Scenario:** #1 - Restoration and management of rare or declining habitat

**Scenario Description:**
Provide protection from adverse environmental conditions to create refugia for documented occurrences of sensitive plant communities.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

**Feature Measure:** Feet of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 440.0

**Scenario Total Cost:** $3,360.66

**Scenario Cost/Unit:** $7.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **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. | Hours | $12.47 | 8 | $99.76 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 2 | $14.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 8 | $189.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $22.62 | 8 | $180.96 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 2 | $193.22 |
| **Materials** | | | | | | |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $234.18 | 3 | $702.54 |
| Post, Wood, CCA treated, 6 in. x 12-14 ft. | 13 | Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only. | Each | $28.06 | 38 | $1,066.28 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.10 | 1648 | $164.80 |
| Gate, Game, 8 ft. High X 4 ft. Length | 1082 | 4 Foot wide game gate (8 feet tall). Includes materials and shipping only. | Each | $190.05 | 1 | $190.05 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E644A - Managing Flood-Irrigated Landscapes for Wildlife

**Scenario:** #1 - Managing Flood-Irrigated Landscapes for Wildlife

**Scenario Description:**

Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,234.20

**Scenario Cost/Unit:** $24.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 9 | $213.03 |
| **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. | Hours | $24.46 | 22 | $538.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |

**Practice:** E645A - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

**Scenario:** #1 - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

**Scenario Description:**

Reduction of artificial perching sites, nest sites, food, and water available to subsidized predators in areas where human-subsidized predators are a threat to sensitive wildlife species. Human-subsidized predators may include ravens, crows, magpies, coyotes, foxes, skunks, raccoons, and other species. Activities under this enhancement may include removal of non- native or invasive trees; removal of unused power poles, corrals, windmills, buildings, and other vertical structures; and/or removal or management of watering facilities, dead livestock, road kill, garbage, animal feed, dumps, and other non-natural food sources.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

**Feature Measure:** Acre

**Scenario Unit:** Number

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,000.16

**Scenario Cost/Unit:** $50.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 24 | $568.08 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.75 | 24 | $258.00 |
| **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. | Hours | $24.46 | 48 | $1,174.08 |

**Practice:** E645B - Manage existing shrub thickets to provide adequate shelter for wildlife

**Scenario:** #3 - Manage existing shrub thickets to provide adequate shelter for wildlife

**Scenario Description:**

Existing shrub thickets provide an instant and important cover for wildlife. Various wildlife species may use shrubs as winter/thermal cover, summer shade, roosting, or as escape cover from predators. Proper management ensures that these shrubs will continue to provide the desired benefits for the local wildlife. A combination of herbicide treatments, cutting and trimming branches, and removal of other competing vegetation will occur. An eligible existing shrub thicket needs to have a canopy cover of 750 square feet, with an end goal of expanding to 1500 square feet. Any existing shrub thicket (not hand planted within the last 5 years) are eligible for this enhancement. Shrub thickets found within fence rows may now be very wide, but still meet the 750 square feet, are eligible.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $291.77

**Scenario Cost/Unit:** $291.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 2 | $14.00 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.13 | 2 | $4.26 |
| **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. | Hours | $31.49 | 2 | $62.98 |
| 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. | Hours | $24.46 | 4 | $97.84 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 1 | $42.07 |
| 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 shipping only. | Acres | $1.51 | 1 | $1.51 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** E645C - Edge feathering for wildlife cover

**Scenario:** #3 - Edge feathering for wildlife cover

**Scenario Description:**

Selected trees are cut and brush clipped along the border between a wooded area and a grassland, cropland, or idle land, creating a dense woody cover of interlocking branches at ground level. The feathered edge will be an average of 30 feet wide and a minimum of 50 feet long, resulting in an area of 1500 square feet. The width of the strip will vary to follow topographic features and to create a wavy border; the design will also consider aesthetics. Vegetative composition and cover will vary within the edge, ranging from areas with no trees and shrubs to areas with scattered trees and extensive shrub cover. The variation in vegetation structure along with variable width of the edge will create feathering. The edge may include shrub plantings for wildlife food and aesthetics.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $789.89

**Scenario Cost/Unit:** $789.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 8 | $56.00 |
| 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. | Hours | $70.17 | 2 | $140.34 |
| **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. | Hours | $31.49 | 8 | $251.92 |
| 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. | Hours | $24.46 | 8 | $195.68 |
| 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. | Hours | $24.46 | 2 | $48.92 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 1 | $27.92 |
| **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 | $69.11 | 1 | $69.11 |

**Practice:** E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

**Scenario:** #1 - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

**Scenario Description:**

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,357.63

**Scenario Cost/Unit:** $27.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 9 | $213.03 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 2.5 | $123.43 |
| **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. | Hours | $24.46 | 22 | $538.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |

**Practice:** E646C - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

**Scenario:** #1 - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

**Scenario Description:**

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding and providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $2,586.53

**Scenario Cost/Unit:** $51.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 9 | $213.03 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 4.5 | $222.17 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $15.87 | 50 | $793.50 |
| **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. | Hours | $24.46 | 22 | $538.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 5 | $483.05 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** E647C - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

**Scenario:** #1 - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

**Scenario Description:**

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period of time when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $560.43

**Scenario Cost/Unit:** $11.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $49.37 | 3 | $148.11 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 3 | $75.66 |
| **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 | $168.33 | 2 | $336.66 |

**Practice:** E666A - Maintaining and improving forest soil quality

**Scenario:** #1 - Maintaining and improving forest soil quality

**Scenario Description:**

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,976.99

**Scenario Cost/Unit:** $39.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 4 | $28.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 4 | $82.80 |
| **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. | Hours | $24.46 | 8 | $195.68 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 13 | $1,255.93 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $11.76 | 10 | $117.60 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 5 | $43.90 |
| Certified Organic, Annual Grasses, Legumes and/or Forbs | 2343 | Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only. | Acres | $68.58 | 3 | $205.74 |

**Practice:** E666D - Forest management to enhance understory vegetation

**Scenario:** #1 - Forest management to enhance understory vegetation

**Scenario Description:**

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical, and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $5,048.76

**Scenario Cost/Unit:** $252.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $90.63 | 16 | $1,450.08 |
| 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. | Hours | $70.17 | 16 | $1,122.72 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 16 | $403.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 11 | $1,062.71 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 20 | $841.40 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E666F - Reduce forest stand density to create open stand structure

**Scenario:** #1 - Reduce forest stand density to create open stand structure

**Scenario Description:**

Reducing forest stand density creates open forest conditions with a low basal area which promotes the health and vigor of the residual trees. The open stand structure allows a significant amount of sunlight to reach the forest floor and stimulates the growth of understory vegetation. Understory vegetation management, along with the wide spacing between trees or clumps of trees, provides visual appeal, lowers the risk of wildfire, and provides habitat for many at-risk and listed wildlife species. The enhancement creates conditions that facilitate a follow-up treatment with prescribed burning.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $5,792.84

**Scenario Cost/Unit:** $289.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $90.63 | 20 | $1,812.60 |
| 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. | Hours | $70.17 | 20 | $1,403.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $25.22 | 20 | $504.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 11 | $1,062.71 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $42.07 | 20 | $841.40 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E666H - Increase on-site carbon storage

**Scenario:** #1 - Increase on-site carbon storage

**Scenario Description:**

Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic material.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,255.93

**Scenario Cost/Unit:** $12.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 13 | $1,255.93 |

**Practice:** E666I - Crop tree management for mast production

**Scenario:** #1 - Crop tree management for mast production

**Scenario Description:**
Forest stand improvement using crop tree management techniques to increase mast production

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,725.15

**Scenario Cost/Unit:** $372.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 25 | $175.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| 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. | Hours | $70.17 | 25 | $1,754.25 |
| **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. | Hours | $24.46 | 25 | $611.50 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 8 | $772.88 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 10 | $87.80 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 10 | $181.70 |

**Practice:** E666J - Facilitating oak forest regeneration

**Scenario:** #1 - Facilitating oak forest regeneration

**Scenario Description:**

Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (i.e., a regeneration cut). After a regeneration cut, oaks in the seedling and sapling stages are often out-competed by invasive brush and undesirable tree and shrub species. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

**Before Situation:**

Naturally regenerated oak seedlings and/or saplings are threatened by competition from undesirable vegetation.

**After Situation:**

Oaks in the forest stand are free from competition and have adequate space and light to allow them to grow into the forest canopy.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $13,306.91

**Scenario Cost/Unit:** $532.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 6 | $42.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 16 | $378.72 |
| 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. | Hours | $70.17 | 10 | $701.70 |
| **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. | Hours | $31.49 | 6 | $188.94 |
| 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. | Hours | $24.46 | 56 | $1,369.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 34 | $3,284.74 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 5 | $43.90 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 5 | $139.60 |
| 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 shipping only. | Acres | $1.51 | 5 | $7.55 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials only. | Each | $4.22 | 1250 | $5,275.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.06 | 2500 | $150.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 48 in. | 1582 | 3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.38 | 1250 | $1,725.00 |

**Practice:** E666K - Creating structural diversity with patch openings

**Scenario:** #1 - Creating structural diversity with patch openings

**Scenario Description:**

Forest stand improvement that creates patch openings. Size, shape, and arrangement of patches will be based on natural features, and emulate patches that would result from natural disturbance regimes of wind or fire, varying geographically and by forest type, and by tree species desired from natural regeneration. The treatment will create diversity in stand composition and structure, increase pest resistance, and enhance wildlife food availability. Openings may provide regeneration sites and restore natural plant communities, and achieve or maintain a desired understory plant community for wildlife habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $7,972.35

**Scenario Cost/Unit:** $531.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 150 | $1,050.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 15 | $355.05 |
| **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. | Hours | $24.46 | 150 | $3,669.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 30 | $2,898.30 |

**Practice:** E666L - Forest Stand Improvement to rehabilitate degraded hardwood stands

**Scenario:** #1 - Forest Stand Improvement to rehabilitate degraded hardwood stands

**Scenario Description:**

Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,274.01

**Scenario Cost/Unit:** $527.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 16 | $112.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| 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. | Hours | $70.17 | 40 | $2,806.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $20.70 | 16 | $331.20 |
| **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. | Hours | $24.46 | 16 | $391.36 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 8 | $772.88 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 10 | $87.80 |
| Herbicide, Triazine | 1321 | Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $55.63 | 10 | $556.30 |
| **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 | $168.33 | 1 | $168.33 |

**Practice:** E666O - Snags, den trees, and coarse woody debris for wildlife habitat

**Scenario:** #1 - Snags, den trees, and coarse woody debris for wildlife habitat

**Scenario Description:**

Improve wildlife habitat through creation and retention of snags, den trees, forest stand structural diversity, and coarse woody debris on the forest floor, to provide cover/shelter for native wildlife species.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $521.78

**Scenario Cost/Unit:** $52.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 7 | $49.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 1 | $23.67 |
| 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. | Hours | $70.17 | 3 | $210.51 |
| **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. | Hours | $31.49 | 7 | $220.43 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 1 | $18.17 |

**Practice:** E666P - Summer roosting habitat for native forest-dwelling bat species

**Scenario:** #1 - Summer roosting habitat for native forest-dwelling bat species

**Scenario Description:**
Create new potential roost trees within upland and riparian forests to achieve desired summer habitat for forest-dwelling bat species.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,119.15

**Scenario Cost/Unit:** $211.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 13 | $91.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 6 | $142.02 |
| 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. | Hours | $70.17 | 13 | $912.21 |
| **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. | Hours | $24.46 | 13 | $317.98 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 10 | $87.80 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $18.17 | 10 | $181.70 |

**Practice:** E666Q - Increase diversity in pine plantation monocultures

**Scenario:** #1 - Increase diversity in pine plantation monocultures

**Scenario Description:**

Create small openings to provide diversity in pine plantations, which are typically monocultures and inhospitable to wildlife. Small openings are one-half (0.5) to three (3) acres in size. The cleared area will have the vegetation removed through cutting, mulching, or other means compatible with the site.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $1,062.98

**Scenario Cost/Unit:** $531.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 20 | $140.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 2 | $47.34 |
| **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. | Hours | $24.46 | 20 | $489.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 4 | $386.44 |

**Practice:** E666R - Forest songbird habitat maintenance

**Scenario:** #1 - Forest songbird habitat maintenance

**Scenario Description:**

Adopts guidelines and methods developed by the Forest Bird Initiative of the Vermont Audubon Society, to preserve habitat features following a forest stand improvement treatment designed to create habitat for a suite of forest-dwelling neotropical migratory songbirds. It includes developing or updating a forest management plan, inspecting and tending forest habitat, and monitoring bird populations. It protects investments in habitat creation by providing for follow-up activities that require the expertise of a professional forester or biologist. This enhancement is appropriate for states in the Atlantic Flyway and the Upper Midwest.

**Before Situation:**

The bird habitat of a forest stand is threatened by undesirable vegetation, including noxious and invasive plants, and tree regeneration of species not favorable to birds. Harmful insects and tree diseases may also be present, and storms may have damaged

**After Situation:**

The forest stand has retained its habitat features and is utilized by a diversity of neotropical migratory songbirds.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $4,575.64

**Scenario Cost/Unit:** $183.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $7.00 | 4 | $28.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $23.67 | 10 | $236.70 |
| 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. | Hours | $70.17 | 4 | $280.68 |
| **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. | Hours | $31.49 | 4 | $125.96 |
| 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. | Hours | $24.46 | 4 | $97.84 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $96.61 | 38 | $3,671.18 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $8.78 | 2 | $17.56 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $27.92 | 4 | $111.68 |
| 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 shipping only. | Acres | $1.51 | 4 | $6.04 |