Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #10 - 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) of 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 has 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 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 inventories-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 for conservation practices 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: $8,351.86

Scenario Cost/Unit: $8,351.86

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).	Hour	$91.91	55	$5,055.05
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.	Hour	$76.67	43	$3,296.81

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #11 - 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) of 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 has 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 inventories-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 for conservation practices 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: $10,420.07

Scenario Cost/Unit: $10,420.07

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).	Hour	$91.91	75	$6,893.25
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.	Hour	$76.67	46	$3,526.82

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #12 - 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) of 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 has 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 inventories-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 for conservation practices 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: $10,757.70

Scenario Cost/Unit: $10,757.70

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).	Hour	$91.91	72	$6,617.52
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.	Hour	$76.67	54	$4,140.18

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #13 - 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) of 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 has 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 inventories-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 for conservation practices 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: $11,906.81

Scenario Cost/Unit: $11,906.81

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).	Hour	$91.91	82	$7,536.62
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.	Hour	$76.67	57	$4,370.19

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #14 - 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) of 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 has 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 inventories-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 for conservation practices 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: $12,994.96

Scenario Cost/Unit: $12,994.96

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).	Hour	$91.91	88	$8,088.08
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.	Hour	$76.67	64	$4,906.88

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #15 - 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) of 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 has 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 inventories-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 for conservation practices 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: $13,240.21

Scenario Cost/Unit: $13,240.21

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).	Hour	$91.91	89	$8,179.99
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.	Hour	$76.67	66	$5,060.22

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #16 - 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) of 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's/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 has 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 inventories/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 for conservation practices 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: $7,522.79

Scenario Cost/Unit: $7,522.79

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).	Hour	$91.91	66	$6,066.06
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.	Hour	$76.67	19	$1,456.73

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario #17 - 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) of 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's/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 has 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 inventories/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 for conservation practices 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: $9,345.75

Scenario Cost/Unit: $9,345.75

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).	Hour	$91.91	85	$7,812.35
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.	Hour	$76.67	20	$1,533.40

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) of 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 has 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 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 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 inventories-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: $4,844.10

Scenario Cost/Unit: $4,844.10

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.	Hour	$78.50	50	$3,925.00
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$91.91	10	$919.10

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) of 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's€™s/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 has 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 a the CNMP Case File that describes management and conservation practice practices 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 inventories/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. Decisions selected in the Record of Decision will provide estimated quantities for conservation practices 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: $2,835.85

Scenario Cost/Unit: $2,835.85

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).	Hour	$91.91	10	$919.10
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.	Hour	$76.67	25	$1,916.75

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) of 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 has 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 with 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 inventories-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 for conservation practices 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: $6,362.20

Scenario Cost/Unit: $6,362.20

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).	Hour	$91.91	15	$1,378.65
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.	Hour	$76.67	65	$4,983.55

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) of 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 owners/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 has 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 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 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 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. Decisions selected in the Record of Decisions will provide estimated quantities for conservation practices 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: $3,219.20

Scenario Cost/Unit: $3,219.20

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).	Hour	$91.91	10	$919.10
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.	Hour	$76.67	30	$2,300.10

Practice: 104 - Nutrient Management Plan - Written

Scenario #8 - 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 applicant and management of . 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 develop of the "Nutrient Management" conservation activity plan. 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.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,355.00

Scenario Cost/Unit: $2,355.00

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.	Hour	$78.50	30	$2,355.00

Practice: 104 - Nutrient Management Plan - Written

Scenario #9 - 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 applicant and management of . 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 develop of the "Nutrient Management" conservation activity plan. 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.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,140.00

Scenario Cost/Unit: $3,140.00

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.	Hour	$78.50	40	$3,140.00

Practice: 104 - Nutrient Management Plan - Written

Scenario #10 - 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 applicant and management of . 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 develop of the "Nutrient Management" conservation activity plan. 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.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,925.00

Scenario Cost/Unit: $3,925.00

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.	Hour	$78.50	50	$3,925.00

Practice: 104 - Nutrient Management Plan - Written

Scenario #11 - 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 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 applicant and management of . 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 develop of the "Nutrient Management" conservation activity plan. 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.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,925.00

Scenario Cost/Unit: $3,925.00

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.	Hour	$78.50	50	$3,925.00

Practice: 104 - Nutrient Management Plan - Written

Scenario #12 - 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 applicant and management of . 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 develop of the "Nutrient Management" conservation activity plan. 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.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,495.00

Scenario Cost/Unit: $5,495.00

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.	Hour	$78.50	70	$5,495.00

Practice: 104 - Nutrient Management Plan - Written

Scenario #13 - 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 applicant and management of . 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 develop of the "Nutrient Management" conservation activity plan. 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.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,672.50

Scenario Cost/Unit: $6,672.50

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.	Hour	$78.50	85	$6,672.50

Practice: 106 - Forest Management Plan - Written

Scenario #14 - 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 Plan" 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: $1,413.79

Scenario Cost/Unit: $1,413.79

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.	Hour	$74.41	19	$1,413.79

Practice: 106 - Forest Management Plan - Written

Scenario #15 - 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 Plan" 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: $1,785.84

Scenario Cost/Unit: $1,785.84

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.	Hour	$74.41	24	$1,785.84

Practice: 106 - Forest Management Plan - Written

Scenario #16 - 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 Plan" 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: $3,199.63

Scenario Cost/Unit: $3,199.63

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.	Hour	$74.41	43	$3,199.63

Practice: 106 - Forest Management Plan - Written

Scenario #17 - 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 Plan" 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: $4,613.42

Scenario Cost/Unit: $4,613.42

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.	Hour	$74.41	62	$4,613.42

Practice: 106 - Forest Management Plan - Written

Scenario #18 - 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 Plan" 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: $5,357.52

Scenario Cost/Unit: $5,357.52

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.	Hour	$74.41	72	$5,357.52

Practice: 106 - Forest Management Plan - Written

Scenario #19 - 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 Plan" 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: $6,696.90

Scenario Cost/Unit: $6,696.90

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.	Hour	$74.41	90	$6,696.90

Practice: 108 - Feed Management Plan - Written

Scenario #13 - 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” (FM) 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 FM 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 FM 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: $1,840.08

Scenario Cost/Unit: $1,840.08

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.	Hour	$76.67	24	$1,840.08

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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, 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. 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: $2,308.20

Scenario Cost/Unit: $2,308.20

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).	Hour	$76.94	30	$2,308.20

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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, 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. 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: $3,077.60

Scenario Cost/Unit: $3,077.60

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).	Hour	$76.94	40	$3,077.60

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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, 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. 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: $4,616.40

Scenario Cost/Unit: $4,616.40

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).	Hour	$76.94	60	$4,616.40

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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, 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. 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: $5,385.80

Scenario Cost/Unit: $5,385.80

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).	Hour	$76.94	70	$5,385.80

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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, 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. 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: $3,847.00

Scenario Cost/Unit: $3,847.00

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).	Hour	$76.94	50	$3,847.00

Practice: 112 - Prescribed Burning Plan - Written

Scenario #10 - 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 Plan” 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: $372.05

Scenario Cost/Unit: $372.05

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.	Hour	$74.41	5	$372.05

Practice: 112 - Prescribed Burning Plan - Written

Scenario #11 - 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 Plan” 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: $595.28

Scenario Cost/Unit: $595.28

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.	Hour	$74.41	8	$595.28

Practice: 112 - Prescribed Burning Plan - Written

Scenario #12 - 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 Plan” 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: $892.92

Scenario Cost/Unit: $892.92

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.	Hour	$74.41	12	$892.92

Practice: 112 - Prescribed Burning Plan - Written

Scenario #13 - 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 Plan” 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: $1,190.56

Scenario Cost/Unit: $1,190.56

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.	Hour	$74.41	16	$1,190.56

Practice: 112 - Prescribed Burning Plan - Written

Scenario #14 - 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 Plan” 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: $1,488.20

Scenario Cost/Unit: $1,488.20

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.	Hour	$74.41	20	$1,488.20

Practice: 112 - Prescribed Burning Plan - Written

Scenario #15 - 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 Plan” 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: $1,785.84

Scenario Cost/Unit: $1,785.84

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.	Hour	$74.41	24	$1,785.84

Practice: 114 - Integrated Pest Management Plan - Written

Scenario #5 - 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:

Agricultural currently producer has no plan or limited knowledge of development 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 management of pests and reduce the 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 plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin 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. 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 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. 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: $1,962.50

Scenario Cost/Unit: $1,962.50

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.	Hour	$78.50	25	$1,962.50

Practice: 114 - Integrated Pest Management Plan - Written

Scenario #6 - 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:

Agricultural currently producer has no plan or limited knowledge of development 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 management of pests and reduce the 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 plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin 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. 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 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. 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: $2,512.00

Scenario Cost/Unit: $2,512.00

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.	Hour	$78.50	32	$2,512.00

Practice: 114 - Integrated Pest Management Plan - Written

Scenario #7 - 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:

Agricultural currently producer has no plan or limited knowledge of development 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 management of pests and reduce the 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 plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin 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. 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 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. 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: $3,925.00

Scenario Cost/Unit: $3,925.00

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.	Hour	$78.50	50	$3,925.00

Practice: 118 - Irrigation Water Management Plan - Written

Scenario #3 - 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:

Currently 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, profit margin, 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 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. 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: $3,216.85

Scenario Cost/Unit: $3,216.85

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).	Hour	$91.91	35	$3,216.85

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:

Currently 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. Producer is interested in management of irrigation water to maximize yields, profit margin, 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 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: $5,055.05

Scenario Cost/Unit: $5,055.05

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).	Hour	$91.91	55	$5,055.05

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #65 - 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. 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: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. 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: $2,106.39

Scenario Cost/Unit: $2,106.39

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).	Hour	$91.91	9	$827.19
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.	Hour	$41.34	17	$702.78
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.	Hour	$28.28	1.5	$42.42
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	12	$534.00

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #66 - AgEMP Medium, One Enterprise

Scenario Description:

Typical operation has either 301 to 2500 Ac 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. A medium operation as 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: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a medium small operation with enterprise 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: $2,615.60

Scenario Cost/Unit: $2,615.60

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).	Hour	$91.91	12	$1,102.92
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.	Hour	$41.34	18	$744.12
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.	Hour	$28.28	2	$56.56
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	16	$712.00

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #67 - AgEMP Large, One Enterprise

Scenario Description:

Typical operation has either > 2,500 Ac > 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. 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: Energy Conservation.

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a large operation with enterprise 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: $3,444.79

Scenario Cost/Unit: $3,444.79

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).	Hour	$91.91	19	$1,746.29
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.	Hour	$41.34	20	$826.80
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.	Hour	$28.28	2.5	$70.70
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	18	$801.00

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #68 - AgEMP Small, Two Enterprise

Scenario Description:

Typical operation has either <300 Ac <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. 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: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type small sized 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: $3,251.99

Scenario Cost/Unit: $3,251.99

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).	Hour	$91.91	15	$1,378.65
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.	Hour	$41.34	21	$868.14
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.	Hour	$28.28	2.5	$70.70
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	21	$934.50

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #69 - AgEMP Medium Two Enterprises

Scenario Description:

Typical operation has either 301 to 2500 Ac 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: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt 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: $4,397.59

Scenario Cost/Unit: $4,397.59

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).	Hour	$91.91	21	$1,930.11
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.	Hour	$41.34	25	$1,033.50
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.	Hour	$28.28	3.5	$98.98
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	30	$1,335.00

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #70 - AgEMP Large, Two Enterprises

Scenario Description:

Typical operation has either > 2,500 Ac > 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 extra enterprises. 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: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt 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). 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: $6,002.74

Scenario Cost/Unit: $6,002.74

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).	Hour	$91.91	32	$2,941.12
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.	Hour	$41.34	29	$1,198.86
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.	Hour	$28.28	4.5	$127.26
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	39	$1,735.50

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #71 - AgEMP Small, Three Enterprise

Scenario Description:

Typical operation has either < 300 Acres < 300 AU Up to 2 irrigation pumps <20,000 sq ft of heater greenhouse, or 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. 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

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of operation with three 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 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: $3,761.20

Scenario Cost/Unit: $3,761.20

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).	Hour	$91.91	18	$1,654.38
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.	Hour	$41.34	22	$909.48
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.	Hour	$28.28	3	$84.84
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	25	$1,112.50

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #72 - AgEMP Medium, Three Enterprise

Scenario Description:

Typical operation has either 301 to 2500 Ac 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. 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:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of operation with three 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: $4,906.80

Scenario Cost/Unit: $4,906.80

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).	Hour	$91.91	24	$2,205.84
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.	Hour	$41.34	26	$1,074.84
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.	Hour	$28.28	4	$113.12
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	34	$1,513.00

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #73 - AgEMP Large, Three Enterprise

Scenario Description:

Typical operation has either > 2,500 Ac > 1000 AU More than 7 irrigation pumps or > 40,001 sq ft of heater greenhouse Three enterprise 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 extra enterprises. 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:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt 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). 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: $6,603.86

Scenario Cost/Unit: $6,603.86

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).	Hour	$91.91	36	$3,308.76
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.	Hour	$41.34	30	$1,240.20
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.	Hour	$28.28	5	$141.40
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	43	$1,913.50

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #74 - 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 an small 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 128CAP. 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:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any operation with four 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, 670Lighting 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: $4,590.39

Scenario Cost/Unit: $4,590.39

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).	Hour	$91.91	25	$2,297.75
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.	Hour	$41.34	24	$992.16
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.	Hour	$28.28	3.5	$98.98
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	27	$1,201.50

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #75 - AgEMP 128 Medium, Four Enterprise

Scenario Description:

Typical operation has either 301 to 2500 Ac 301 to 1000 AU 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq ft heated greenhouse Four enterprise 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. 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:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt 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). 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: $5,735.99

Scenario Cost/Unit: $5,735.99

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).	Hour	$91.91	31	$2,849.21
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.	Hour	$41.34	28	$1,157.52
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.	Hour	$28.28	4.5	$127.26
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	36	$1,602.00

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario #76 - AgEMP 128 Large, Four Enterprise

Scenario Description:

Typical operation has either > 2,500 Ac > 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 an large livestock operation, one of which is described above. . Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. 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:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt 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: $7,524.96

Scenario Cost/Unit: $7,524.96

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).	Hour	$91.91	44	$4,044.04
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.	Hour	$41.34	32	$1,322.88
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.	Hour	$28.28	5.5	$155.54
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.50	45	$2,002.50

Practice: 130 - Drainage Water Management Plan - Written

Scenario #3 - 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: $2,732.47

Scenario Cost/Unit: $2,732.47

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.	Hour	$108.19	8	$865.52
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.	Hour	$76.67	13	$996.71
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.	Hour	$54.39	16	$870.24

Practice: 130 - Drainage Water Management Plan - Written

Scenario #4 - 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: $3,259.83

Scenario Cost/Unit: $3,259.83

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.	Hour	$108.19	8	$865.52
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.	Hour	$76.67	13	$996.71
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.	Hour	$54.39	16	$870.24
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$32.96	16	$527.36

Practice: 138 - Conservation Plan Supporting Organic Transition - Written

Scenario #4 - 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 operation based upon personal knowledge, or other local criteria. Producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. 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. 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. 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: $5,750.25

Scenario Cost/Unit: $5,750.25

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.	Hour	$76.67	75	$5,750.25

Practice: 138 - Conservation Plan Supporting Organic Transition - Written

Scenario #5 - 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 operation based upon personal knowledge, or other local criteria. Producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. 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. 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 only. The CAP plan will include conservation practices which address related resource concerns. 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: $4,906.88

Scenario Cost/Unit: $4,906.88

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.	Hour	$76.67	64	$4,906.88

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario #3 - Fish and Wildlife Habitat Management CAP

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation.

Before Situation:

Agricultural currently 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 habitat. Within existing land uses, 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, participant has obtained services from a certified TSP for develop of the "Fish and Wildlife Management" conservation activity plan. 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. 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: $3,338.16

Scenario Cost/Unit: $3,338.16

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).	Hour	$79.48	42	$3,338.16

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario #18 - 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. 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:

Agricultural currently 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 habitat. Within existing land uses, 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, participant has obtained services from a certified TSP for develop of the "Fish and Wildlife Management" conservation activity plan. 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. 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: $3,497.12

Scenario Cost/Unit: $3,497.12

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).	Hour	$79.48	44	$3,497.12

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario #34 - 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. 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:

Agricultural currently 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 habitat. Within existing land uses, 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, participant has obtained services from a certified TSP for develop of the "Fish and Wildlife Management" conservation activity plan. 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. 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: $4,132.96

Scenario Cost/Unit: $4,132.96

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).	Hour	$79.48	52	$4,132.96

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario #50 - 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. CAP addresses fish and wildlife habitat management relative to only one land use on the agricultural operation.

Before Situation:

Agricultural currently 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 habitat. Within existing land uses, 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, participant has obtained services from a certified TSP for develop of the "Fish and Wildlife Management" conservation activity plan. 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. 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: $2,861.28

Scenario Cost/Unit: $2,861.28

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).	Hour	$79.48	36	$2,861.28

Practice: 146 - Pollinator Habitat Plan - Written

Scenario #4 - 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, 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 develop of the "Pollinator Habitat Enhancement" conservation activity plan. 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. 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: $3,338.16

Scenario Cost/Unit: $3,338.16

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).	Hour	$79.48	42	$3,338.16

Practice: 146 - Pollinator Habitat Plan - Written

Scenario #5 - 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, 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 develop of the "Pollinator Habitat Enhancement" conservation activity plan. 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. 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: $4,848.28

Scenario Cost/Unit: $4,848.28

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).	Hour	$79.48	61	$4,848.28

Practice: 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

Scenario #5 - IPM Herbicide Resistance Weed Management CAP Small-Specialty Less Than or Equal to 50 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in management of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. 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 use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,355.00

Scenario Cost/Unit: $2,355.00

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.	Hour	$78.50	30	$2,355.00

Practice: 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

Scenario #6 - IPM Herbicide Resistance Weed Management CAP Medium 51 - 250 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in management of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. 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 use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,061.50

Scenario Cost/Unit: $3,061.50

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.	Hour	$78.50	39	$3,061.50

Practice: 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

Scenario #7 - IPM Herbicide Resistance Weed Management CAP Large - Greater Than 250 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in management of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. 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 use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit:: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,710.00

Scenario Cost/Unit: $4,710.00

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.	Hour	$78.50	60	$4,710.00

Practice: 309 - Agrichemical Handling Facility

Scenario #2 - Agrichemical Handling Pad under a Roof

Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

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:

This scenario is an agrichemical handling facility pad is constructed with a roof. The average size of the agrichemical handling pad for mixing and loading is 18' x 24' with an application equipment length of 16 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. 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: Total Containment Area

Scenario Unit:: Square Foot

Scenario Typical Size: 432.0

Scenario Total Cost: $10,561.86

Scenario Cost/Unit: $24.45

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 Yard	$230.94	8	$1,847.52
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 Yard	$359.17	6	$2,155.02
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	4	$266.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	10	$300.50
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$603.10	1	$603.10
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	$0.89	432	$384.48
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 Foot	$9.03	432	$3,900.96
Pump, Sump, less than 1/4 HP	2582	Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft or more, 300 GPH at 10', electric, manually operated. Includes materials and shipping (pump and motor).	Each	$173.78	1	$173.78
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

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	$0.35	500	$175.00

Practice: 309 - Agrichemical Handling Facility

Scenario #3 - Concrete Pad For Mixing and Loading

Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Nutrient Management (590), Pest Management (595)

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:

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 18' x 24' with an application equipment length of 16 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. 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: Total Containment Area

Scenario Unit:: Square Foot

Scenario Typical Size: 432.0

Scenario Total Cost: $6,660.90

Scenario Cost/Unit: $15.42

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 Yard	$230.94	8	$1,847.52
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 Yard	$359.17	6	$2,155.02
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	4	$266.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	10	$300.50
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$603.10	1	$603.10
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	$0.89	432	$384.48
Pump, Sump, less than 1/4 HP	2582	Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft or more, 300 GPH at 10', electric, manually operated. Includes materials and shipping (pump and motor).	Each	$173.78	1	$173.78
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	500	$175.00

Practice: 309 - Agrichemical Handling Facility

Scenario #4 - Portable Poly Pad For Handling < 65 SF

Scenario Description:

This practice scenario is a portable agrichemical handling facility for mixing and loading operations. 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), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

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:

This scenario is a portable agrichemical handling facility consisting of an impermeable barrier poly pad for mixing and loading operations. The average size of the poly pad is 6'x6' with an application equipment length of 4 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Mixing Area

Scenario Unit:: Square Foot

Scenario Typical Size: 36.0

Scenario Total Cost: $752.16

Scenario Cost/Unit: $20.89

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.	Hour	$20.64	1	$20.64
Materials						
PVC Containment Basin, 6' x 6'	1611	Poly containment basin typically 8" to 12" deep with area dimensions in the range of 6' x 6' or larger.	Square Foot	$20.32	36	$731.52

Practice: 309 - Agrichemical Handling Facility

Scenario #6 - Fabricated Liquid Storage With Adjacent Concrete Handling Pad

Scenario Description:

This practice scenario is a fabricated agrichemical handling facility for storage of liquid agrichemicals along with an adjacent concrete mixing and loading pad. 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)

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 along with an adjacent handling pad for mixing and loading operations. The average size of the fabricated containment is 30 ft x 40 ft with flexible membrane lined walls. The walls are of modular blocks stacked two high for a 4ft wall height on four sides. A handling pad for mixing and loading is located adjacent to the liquid containment and is 16' x 32' with an application equipment length of 28 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed (6") reinforced concrete handling pad for mixing and loading. 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: Liquid Containment Area + Handlin

Scenario Unit:: Square Foot

Scenario Typical Size: 1,712.0

Scenario Total Cost: $14,797.97

Scenario Cost/Unit: $8.64

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 Yard	$230.94	19	$4,387.86
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	8	$2,873.36
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	15	$34.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	8	$358.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	27	$800.55
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	4	$120.20
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yard	$109.45	42	$4,596.90
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	$0.89	512	$455.68
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	$70.51	2	$141.02
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	200	$70.00

Practice: 313 - Waste Storage Facility

Scenario #1 - Earthen Storage Facility less than 50K ft3 Storage

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. 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) .

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 : design storage volume 25,000 ft3; 87'X87' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 9.5' (design depth = 8'); (not include in volume - 1' freeboard and 0.5' sludge accumulation).

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 25,000.0

Scenario Total Cost: $8,093.41

Scenario Cost/Unit: $0.32

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 Yard	$3.84	806	$3,095.04
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	578	$1,820.70
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	224	$199.36
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	582	$2,194.14
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	$3.44	12	$41.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 313 - Waste Storage Facility

Scenario #2 - Earthen Storage Facility greater than 50K ft3 Storage

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of more than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. 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), Solid/Liquid Waste Separation Facility (632), and Waste Treatment (629).

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 facility. 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: design storage volume 168,000 ft3; 157'X162' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' 8" (design depth = 12'); (not included in volume - 1' freeboard and 8" sludge accumulation).

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 168,000.0

Scenario Total Cost: $42,302.20

Scenario Cost/Unit: $0.25

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 Yard	$3.84	4375	$16,800.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	3284	$10,344.60
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	741	$659.49
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	3634	$13,700.18
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	$3.44	16	$55.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 313 - Waste Storage Facility

Scenario #3 - Earthen Storage Facility High Water Table

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. Due to high water table conditions, the earthen embankment is constructed on the soil surface. Earthfill is obtained within five miles off-site. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Adequately protect liner at agitation and access points. 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), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), and Underground Outlet (620).

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: design storage volume 121,200 ft3; 150'X150' (top); 3:1 inside and outside side slopes; embankment top width = 10'; compaction ratio = 1.1; total depth = 10' (design depth = 8.5'); (not include in volume - 1' freeboard and 0.5' sludge accumulation); embankment volume = 4*160*((10+70)/2)*10*1.1

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 121,200.0

Scenario Total Cost: $146,293.60

Scenario Cost/Unit: $1.21

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 Yard	$3.84	10430	$40,051.20
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	10430	$32,854.50
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	97	$16,040.89
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	741	$659.49
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	9689	$36,527.53
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	$0.33	48445	$15,986.85
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	97	$2,410.45
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	$3.44	13	$44.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	3	$1,462.62

Practice: 313 - Waste Storage Facility

Scenario #4 - Drystack, earthen floor, no walls

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor without side walls. This scenario is intended for drier material such as poultry litter. 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 scenario is applicable where geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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

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 off the farm without proper utilization or disposal. 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.

After Situation:

Manure and other agricultural by-products are controlled by collection at the source and are stored temporarily at an environmentally suitable location until such time that they are removed from the farm or are utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $2,101.36

Scenario Cost/Unit: $0.53

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 Yard	$3.84	148	$568.32
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	148	$557.96
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	$487.54	2	$975.08

Practice: 313 - Waste Storage Facility

Scenario #5 - Dry stack, earthen floor, wood wall

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor with wooden walls and posts. This scenario is intended for drier material such as poultry litter. 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 scenario is applicable where geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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

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 off the farm without proper utilization or disposal. 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.

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back in place to make the floor. Walls are 5'0" high, pressure treated wood (2" x 6" boards) with 6" x 6" x 8' posts set 4' c-c. Walls allow for greater storage volume. Walls are placed on three sides of the building with one short side open. Construction includes excavation and compaction of top 1' of earth material, setting posts, and installing wooden walls.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $7,383.26

Scenario Cost/Unit: $1.85

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 Yard	$113.81	1.1	$125.19
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	148	$568.32
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	2.25	$100.91
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	2.25	$16.54
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	148	$557.96
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.	Hour	$20.64	90	$1,857.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2.25	$47.25
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$0.92	2640	$2,428.80
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	216	$291.60
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	$70.51	1	$70.51
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	$171.75	2	$343.50
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	2	$975.08

Practice: 313 - Waste Storage Facility

Scenario #6 - Dry Stack, earthen floor, concrete wall

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor with concrete walls. This scenario is intended for drier material such as poultry litter. Concrete walls are needed for situations where backfill will be placed against the wall or on sites where the requirements of organic certification preclude the use of wooden walls. 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 scenario is applicable where geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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

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 off the farm without proper utilization or disposal. 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.

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back in place to make the floor. Walls are 5' high concrete. Walls allow for greater storage volume. (Concrete walls are 8" wide and 6'6" high on a 1'x 3.5' footer buried 18" below grade.) Walls are placed on three sides of the building with one short side open. Construction includes excavation and compaction of top 1' of earth material and installing concrete walls.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $28,964.54

Scenario Cost/Unit: $7.24

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 Yard	$359.17	70	$25,141.90
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	148	$568.32
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	53	$268.71
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	4	$457.52
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	148	$557.96
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	10.5	$315.53
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	2	$975.08
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	$0.35	525	$183.75

Practice: 313 - Waste Storage Facility

Scenario #7 - Dry Stack, concrete floor, no wall

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. 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. 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

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 off the farm without proper utilization or disposal. 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.

After Situation:

Manure and other agricultural by-products are controlled by collection at the source and are stored temporarily at an environmentally suitable location until such time that they are removed from the farm or are utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The facility floor is 5" reinforced concrete without side walls. Manure and other agricultural by-products are controlled by 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 in accordance with a nutrient management plan. Construction includes topsoil removal (0.5'), placement of compacted gravel (4"), and installation of reinforced concrete (5").

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $17,926.07

Scenario Cost/Unit: $4.48

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 Yard	$230.94	62	$14,318.28
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 Yard	$3.77	74	$278.98
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	49.5	$1,487.48
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	$487.54	2	$975.08
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	$0.35	2475	$866.25

Practice: 313 - Waste Storage Facility

Scenario #8 - Dry Stack, concrete floor, wood wall, existing columns

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor with pressure treated wood walls. 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 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. 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

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 off the farm without proper utilization or disposal. 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.

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). Walls are 5'0" high, pressure treated wood (2" x 6" boards) with 6" x 6" x 8' posts set 4' c-c. Walls allow for greater storage volume. Walls are placed on three sides of the building with one short side open. The facility floor is 5" reinforced concrete. Construction includes excavation and removal of top 0.5' of topsoil, setting posts, and installing concrete floor and wooden walls.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $22,376.93

Scenario Cost/Unit: $5.59

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 Yard	$113.81	1.1	$125.19
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$230.94	62	$14,318.28
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	2.25	$100.91
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	2.25	$16.54
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	74	$278.98
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.	Hour	$20.64	90	$1,857.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2.25	$47.25
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	49.5	$1,487.48
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$0.92	2640	$2,428.80
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	216	$291.60
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	$70.51	1	$70.51
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	2475	$866.25

Practice: 313 - Waste Storage Facility

Scenario #9 - Dry Stack, concrete floor, concrete wall

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor and concrete walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Concrete walls are needed for situations where backfill will be placed against the wall or on sites where the requirements of organic certification preclude the use of wooden walls. 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. 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

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 off the farm without proper utilization or disposal. 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.

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). Walls are 5' high concrete. Walls allow for greater storage volume. (Concrete walls are 8" wide and 6'6" high on a 1'x 3.5' footer buried 18" below grade.) Walls are placed on three sides of the building with one short side open. Construction includes removal of 0.5' of topsoil, installation of 4" of gravel, and installing concrete floor (5") and walls.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $46,502.35

Scenario Cost/Unit: $11.63

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 Yard	$230.94	62	$14,318.28
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	76	$27,296.92
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	62	$314.34
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	4	$457.52
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	74	$278.98
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	60	$1,803.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	3000	$1,050.00

Practice: 313 - Waste Storage Facility

Scenario #10 - Tank, less than 5K cu.ft. of waste stored

Scenario Description:

This scenario consists of installing a small concrete tank with a design storage volume of less than 5,000 CF that is totally or partially buried and has a solid lid with several openings for direct loading from a heavy use area, gutter cleaner or gravity pipe. Manure is held for 3 to 14 day on smaller operations or transferred to larger storage facility or direct land applied. 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. 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).

Before Situation:

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

After Situation:

Manure and other agricultural by-products are controlled by 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, in accordance with a nutrient management plan. This practice will address soil and water quality by reducing pollution potential to soil, surface water, and ground water. The tank is typically 8' deep x 12' wide x 40' long with a design storage volume of 3,600 cubic feet plus 6" freeboard and a concrete top. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Volume does not include 6" of freeboard. Tanks associated with open lots will be sized to handle design storm in tank or in combination with lot as per state regulations. Sitework includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor, walls, and top, and backfilling around the tank. Tank is buried flush with ground.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $21,255.31

Scenario Cost/Unit: $5.90

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 Yard	$230.94	8	$1,847.52
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 Yard	$359.17	38	$13,648.46
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	335	$1,698.45
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	278	$875.70
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	10	$1,143.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	10	$300.50
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	104	$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	$70.51	3	$211.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	500	$175.00

Practice: 313 - Waste Storage Facility

Scenario #11 - Tank, 5Kcu.ft.to 15Kcu.ft. of waste stored

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 5,000 to 14,999 CF that is totally or partially buried and has an open top. The tank can also be under an animal facility with the top cover of either slats or solid concrete lid/floor. Design volume does not include freeboard. 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).

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.

After Situation:

Manure and other agricultural by-products are collected at the source and are stored temporarily at an environmentally suitable location until such time that they are disposed of or 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 and to surface and ground water. The tank is typically 8' deep, with a bottom area of 1256 SF, and a design storage volume of 9,420 cubic feet plus 6" freeboard (40' diameter). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 6.5'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 9,420.0

Scenario Total Cost: $20,946.45

Scenario Cost/Unit: $2.22

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 Yard	$230.94	22	$5,080.68
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	27	$9,697.59
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	186	$943.02
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	427	$1,345.05
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	10	$1,143.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	23	$691.15
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	126	$439.74
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	$70.51	3	$211.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	1150	$402.50

Practice: 313 - Waste Storage Facility

Scenario #12 - Tank, 15Kcu.ft.to 25Kcu.ft. of waste stored

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 15,000 to 24,999 CF. The tank is totally or partially buried and has an open top. It can be under an animal facility with the top cover being slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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), 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).

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. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank is typically 8 ft deep, with a bottom area of 2,667 sq.ft., and a design storage volume of 20,000 cubic feet plus 6” freeboard (58.5' diameter). Size based on design volume of manure, other wastes, rainfall, lot runoff, etc. as appropriate and does not include the 6” of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 6.5'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $34,711.09

Scenario Cost/Unit: $1.74

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 Yard	$230.94	45	$10,392.30
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	39	$14,007.63
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	257	$1,302.99
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	878	$2,765.70
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	18	$2,058.84
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	18	$447.30
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	45	$1,352.25
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	184	$642.16
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	$70.51	3	$211.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	2250	$787.50

Practice: 313 - Waste Storage Facility

Scenario #13 - Tank, 25K to 50K cu.ft. of waste stored

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 25,000 to 49,999 CF. Tank is totally or partially buried and has an open top. Tank can be under a animal facility with the top cover being slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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).

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 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 in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank installed is 10' deep with a bottom area of 2,947 SF, and a design storage volume of 28,000 cubic feet plus 6" freeboard (diameter 61.3'). Size based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Calculated volume for scenario does not include the 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 8'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 28,000.0

Scenario Total Cost: $47,310.23

Scenario Cost/Unit: $1.69

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 Yard	$230.94	49	$11,316.06
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	64	$22,986.88
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	379	$1,921.53
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	1202	$3,786.30
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	24	$2,745.12
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	49	$1,472.45
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	193	$673.57
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	$70.51	3	$211.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	2450	$857.50

Practice: 313 - Waste Storage Facility

Scenario #14 - Tank, 50Kto 75K cu.ft. of waste stored

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 50,000 to 74,999 CF. Tank is totally or partially buried and has an open top, however it can be under a animal facility with the top cover with slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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), 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).

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. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank typically 12' deep, with a bottom area of 5,391 SF, and a design storage volume of 62,000 cubic feet plus 6" freeboard. (Diameter 82.9') Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 10'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 62,000.0

Scenario Total Cost: $83,075.55

Scenario Cost/Unit: $1.34

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 Yard	$230.94	88	$20,322.72
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	102	$36,635.34
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	756	$3,832.92
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	2695	$8,489.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	55	$6,290.90
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	55	$1,366.75
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	88	$2,644.40
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	266	$928.34
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	$70.51	4	$282.04
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	4400	$1,540.00

Practice: 313 - Waste Storage Facility

Scenario #15 - Tank 75Kto 110K cu.ft. of waste stored

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 75,000 to 109,999 CF. Tank is totally or partially buried and has an open top. Tank can also be under an animal facility with the top cover using slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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), 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).

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. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 12' deep, with a bottom area of 8,044 SF, and a storage capacity of 92,500 cubic feet plus 6" freeboard. (Diameter 101.2') Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 10'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 92,500.0

Scenario Total Cost: $110,552.28

Scenario Cost/Unit: $1.20

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 Yard	$230.94	129	$29,791.26
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	124	$44,537.08
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	892	$4,522.44
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	3969	$12,502.35
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	78	$8,921.64
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	78	$1,938.30
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	129	$3,876.45
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	318	$1,109.82
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	$70.51	5	$352.55
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	6450	$2,257.50

Practice: 313 - Waste Storage Facility

Scenario #16 - Tank, 110K cu.ft. of waste stored or greater

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume of 110, 000 or more CF. Tank is totally or partially buried and has an open top. Tank can also be under a animal facility with the top cover using slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. 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), 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).

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. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank typically 14' deep with a bottom area of 11,304 SF and a design storage volume of 152,600 CF plus 6" freeboard. (Diameter = 120') Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 12'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit:: Cubic Foot

Scenario Typical Size: 152,600.0

Scenario Total Cost: $169,160.84

Scenario Cost/Unit: $1.11

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 Yard	$230.94	217	$50,113.98
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	171	$61,418.07
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	1468	$7,442.76
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	6666	$20,997.90
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.	Hour	$114.38	130	$14,869.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	130	$3,230.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	181	$5,439.05
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor.	Foot	$3.49	377	$1,315.73
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	6	$423.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	9050	$3,167.50

Practice: 314 - Brush Management

Scenario #1 - Mechanical, Hand tools

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to cut off woody plants at or below the root collar (autumn olive, bush honeysuckle, multiflora rose and privet typical targets). Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have stands of woody and non herbaceous species that are in the early phases of invasions. Typical unit is 25 acres.

Before Situation:

Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $4,125.93

Scenario Cost/Unit: $165.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	150	$658.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$5.07	10	$50.70
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.	Hour	$20.64	160	$3,302.40
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	$70.51	1	$70.51

Practice: 314 - Brush Management

Scenario #2 - Mechanical, light Infestation (10%-20% of area infested)

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at 10-20% (light) infestation. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $3,463.65

Scenario Cost/Unit: $115.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	10	$219.10
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	$86.58	25	$2,164.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	25	$525.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	10	$383.30
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	$171.75	1	$171.75

Practice: 314 - Brush Management

Scenario #3 - Mechanical, medium Infestation (> 20% <= 50% of area infested)

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at 20% – 50% (medium) infestation. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $5,852.28

Scenario Cost/Unit: $195.08

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.	Hour	$44.85	60	$2,691.00
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	12	$52.68
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	18	$394.38
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.	Hour	$20.64	28	$577.92
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	60	$1,260.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16.2	$620.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 314 - Brush Management

Scenario #4 - Mechanical, heavy Infestation (> 50% of area infested)

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at >50% (heavy) infestation. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $7,732.45

Scenario Cost/Unit: $257.75

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.	Hour	$44.85	86	$3,857.10
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	16	$70.24
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	18	$394.38
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.	Hour	$20.64	36	$743.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	86	$1,806.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	18	$689.94
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	$171.75	1	$171.75

Practice: 314 - Brush Management

Scenario #5 - Mechanical & Chemical

Scenario Description:

Removal of woody vegetation of light-medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation rate. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed and burned 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $6,867.07

Scenario Cost/Unit: $228.90

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.	Hour	$44.85	60	$2,691.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	12	$262.92
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	30	$185.10
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.	Hour	$20.64	48	$990.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	60	$1,260.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16	$613.28
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	30	$569.40
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.	Acre	$1.31	30	$39.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 314 - Brush Management

Scenario #7 - Chemical, Individual Plant Treatment

Scenario Description:

This Practice is for the implementation of brush management on range, pasture or native pasture using Individual Plant Treatment (IPT). The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Before Situation:

Brush species exceed desired levels resulting in degraded plant condition, loss of forage production, or degraded wildlife habitat. Densities of brush exceed levels indicated in the ecological site descriptions.

After Situation:

Brush has been treated to a level which results in improved plant condition, forage production, or wildlife habitat. The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $2,643.42

Scenario Cost/Unit: $88.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	6	$131.46
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	20	$1,305.20
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	20	$568.80
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.	Acre	$37.83	15	$567.45
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	$70.51	1	$70.51

Practice: 314 - Brush Management

Scenario #8 - Chemical - Ground Applied

Scenario Description:

Apply brush management on 30 acres of rangeland, grazed forest, or pasture thru the use of broadcast application of material using low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:

A 30 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $1,735.13

Scenario Cost/Unit: $57.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	30	$185.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Acre	$37.83	30	$1,134.90
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.31	30	$39.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 314 - Brush Management

Scenario #9 - Chemical, Aerial Applied

Scenario Description:

Apply brush management on 80 acres of rangeland, grazed forest, or pasture thru the use of broadcast aerial application of material with low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:

A 80 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit:: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $3,052.26

Scenario Cost/Unit: $38.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	3	$65.73
Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acre	$9.51	80	$760.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	3	$114.99
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	80	$1,518.40
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.	Acre	$1.31	80	$104.80
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	$487.54	1	$487.54

Practice: 314 - Brush Management

Scenario #12 - Mechanical Chem, Cut Stump

Scenario Description:

Removal of medium-heavy infestations of woody invasive on generally B & C slopes, typically limestone soils. The practice entails the removal of brush by the use of chainsaw or mechanical cutter, followed by a direct application of low cost chemical herbicide to prevent resprouting. Purpose is to promote natural regeneration, reduce fuel loading, and improve ecological site condition. Brush density and canopy has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium to heavy infestation rate. Typical unit is 20 acres.

Before Situation:

Area consists of medium to heavy infestation of woody invasive species that are adversely affecting natural regeneration, promoting noxious and invasive species and degrading wildlife habitat. Resource concern is Degraded Plant Condition - Excessive Plant Pressure. Typical Scenario size is 20 acres.

After Situation:

Woody species are removed to achieve the desired natural regeneration of the 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 is achieved.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $6,831.52

Scenario Cost/Unit: $341.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	200	$878.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	20	$438.20
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	10	$652.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	200	$4,128.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	20	$377.40
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 i	Dollar	$1.02	200	$204.00

Practice: 314 - Brush Management

Scenario #14 - Cut Stump, 2 year follow-up spray

Scenario Description:

The practice entails the control of woody vegetation by treating it up to three times with chemical ground application during the multi-year treatment period in order to improve ecological site condition. The brush can be treated with the same method or by a combination of methods. Woody vegetation needs to be treated at least twice in order to fully control it. Generally, herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Brush density has exceeded desired levels based on ecological site potential. Removal of heavy infestations of woody invasive on generally B & C slopes, typically limestone soils. The practice entails the removal of brush by the use of chainsaw or mechanical cutter, followed by a direct application of low cost chemical herbicide to prevent resprouting. Resprouting occurs on approximately 5 acres the year after initial treatment and follow-up spray is required. Resprouting occurs on 2 acres the second year after initial treatment and follow-up spray is required. After that time any remaining resprouting can be controlled through operation and maintenance activities. Purpose is to promote natural regeneration, reduce fuel loading, and improve ecological site condition. Brush density and canopy has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium to heavy infestation rate. Typical unit is 20 acres.

Before Situation:

Area consists of heavy infestation of woody invasive species that are adversely affecting natural regeneration, promoting noxious and invasive species and degrading wildlife habitat. Resource concern is Degraded Plant Condition - Excessive Plant Pressure. Typical Scenario size is 20 acres.

After Situation:

Woody species are removed to achieve the desired natural regeneration of the 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 is achieved.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $9,073.20

Scenario Cost/Unit: $453.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	200	$878.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	22	$482.02
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.	Hour	$65.26	30	$1,957.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	200	$4,128.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	6	$229.98
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$44.20	27	$1,193.40
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 i	Dollar	$1.02	200	$204.00

Practice: 314 - Brush Management

Scenario #15 - Spray Treatment-3yr Completion

Scenario Description:

The practice entails the control of woody vegetation by treating it up to three times with chemical ground application during the multi-year treatment period in order to improve ecological site condition. The brush can be treated with the same method or by a combination of methods. Sweetgum and Sycamore in early successional habitat management areas need to be treated with three chemical ground applications in order to fully control it. Generally, herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Brush density has exceeded desired levels based on ecological site potential. Removal of heavy infestations of woody invasive on generally B & C slopes, typically limestone soils. The practice entails the removal of brush by the use of chainsaw or mechanical cutter, followed by a direct application of low cost chemical herbicide to prevent resprouting. Resprouting occurs on approximately 5 acres the year after initial treatment and follow-up spray is required. Resprouting occurs on 2 acres the second year after initial treatment and follow-up spray is required. After that time any remaining resprouting can be controlled through operation and maintenance activities. Purpose is to promote natural regeneration, reduce fuel loading, and improve ecological site condition. Brush density and canopy has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium to heavy infestation rate. Typical unit is 10 acres.

Before Situation:

Area consists of heavy infestation of woody invasive species that are adversely affecting natural regeneration, promoting noxious and invasive species and degrading wildlife habitat. Resource concern is Degraded Plant Condition - Excessive Plant Pressure. Typical Scenario size is 10 acres.

After Situation:

Woody species are removed to achieve the desired natural regeneration of the 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 is achieved.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,729.63

Scenario Cost/Unit: $472.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	100	$439.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	15	$978.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	100	$2,064.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$44.20	17	$751.40
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 i	Dollar	$1.02	100	$102.00

Practice: 314 - Brush Management

Scenario #16 - Hack and Squirt

Scenario Description:

This practice is for the implementation of brush management on forest land using the hack and squirt method. The typical method of control is cutting or "frilling" around the entire diameter of an invasive tree such as tree-of-heaven with an axe and then spraying a herbicide such as imazapyr thoroughly wetting the frilled area. Infested area is typically located away from the farm headquarters. Acreage is based on 100% infestation - typical infestation is 5 acres.

Before Situation:

Invasive tree species exceed desired levels resulting in degraded plant condition, loss of timber production, or degraded wildlife habitat. Densities of invasive species exceed levels indicated in the ecological site descriptions.

After Situation:

Invasive species have been treated to a level which results in improved plant condition, timber production, or wildlife habitat. The typical method of control is cutting or "frilling" around the entire diameter of an invasive tree such as tree-of-heaven with an axe and then spraying a herbicide such as imazapyr thoroughly wetting the frilled area.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $1,103.44

Scenario Cost/Unit: $220.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	5	$326.30
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$5.07	10	$50.70
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.	Hour	$20.64	15	$309.60
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.	Acre	$37.83	2.5	$94.58
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	$70.51	1	$70.51

Practice: 315 - Herbaceous Weed Treatment

Scenario #1 - Hand Removal

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. 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 is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

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 continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $684.31

Scenario Cost/Unit: $68.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$5.07	16	$81.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	1	$38.33
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	$70.51	1	$70.51

Practice: 315 - Herbaceous Weed Treatment

Scenario #2 - Hand removal 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 is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

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 continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,525.61

Scenario Cost/Unit: $152.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	10	$652.60
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$5.07	16	$81.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	1	$38.33
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
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	$70.51	1	$70.51

Practice: 315 - Herbaceous Weed Treatment

Scenario #3 - Mechanical

Scenario Description:

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 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 treated

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $942.08

Scenario Cost/Unit: $47.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	10	$522.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	10	$210.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
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	$171.75	1	$171.75

Practice: 315 - Herbaceous Weed Treatment

Scenario #4 - Mechanical and Chemical

Scenario Description:

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition, then applying herbicide to control re-growth of target weeds. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 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 treated

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,958.41

Scenario Cost/Unit: $97.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	8	$417.60
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	20	$123.40
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
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.	Acre	$37.83	20	$756.60
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.	Acre	$1.31	20	$26.20
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	$70.51	1	$70.51
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	$171.75	1	$171.75

Practice: 315 - Herbaceous Weed Treatment

Scenario #5 - Chemical, spot treatment over entire site acreage

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,169.54

Scenario Cost/Unit: $58.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	20	$568.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	20	$377.40
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.	Acre	$1.31	20	$26.20

Practice: 315 - Herbaceous Weed Treatment

Scenario #6 - Chemical, Ground

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 using ground equipment 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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,059.52

Scenario Cost/Unit: $52.98

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.	Acre	$6.17	20	$123.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
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.	Acre	$37.83	20	$756.60
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.	Acre	$1.31	20	$26.20

Practice: 315 - Herbaceous Weed Treatment

Scenario #7 - Chemical, Aerial

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 using airplane or helicopter 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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,591.72

Scenario Cost/Unit: $79.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acre	$32.78	20	$655.60
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.	Hour	$38.33	4	$153.32
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.	Acre	$37.83	20	$756.60
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.	Acre	$1.31	20	$26.20

Practice: 316 - Animal Mortality Facility

Scenario #1 - Incineration, < 400 lbs. Capacity

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle < 400 lbs of average daily mortality for the species and size of the operation. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. 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, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. 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).

Before Situation:

Animal mortality is handled 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:

A 200 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is being handled 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. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. 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.

Feature Measure: Each Incinerator

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12,413.26

Scenario Cost/Unit: $12,413.26

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 Yard	$230.94	4	$923.76
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	8	$16.24
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	1	$114.38
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.	Hour	$20.64	1	$20.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	1	$21.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	4	$120.20
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallon	$3.63	285	$1,034.55
Incinerator, 200 lbs/day	1624	Poultry and livestock incinerator with an approximate chamber capacity of 200 pounds per day. Includes equipment and after burner only.	Each	$9,837.14	1	$9,837.14
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	200	$70.00

Practice: 316 - Animal Mortality Facility

Scenario #2 - Incineration 400 - 600 lbs. Capacity

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle 400 to 600 lbs of average daily mortality for the species and size of the operation. Typically very large poultry or medium sized swine operations. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. 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 are reduced, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. 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).

Before Situation:

Animal mortality is handled 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:

A 400 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is handled 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. In non-attainment areas, certain states may require a higher level of processing such as gasification or different methods. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Included is a concrete slab to set the incinerator on and a diesel fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Each Incinerator

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $14,238.11

Scenario Cost/Unit: $14,238.11

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 Yard	$230.94	4	$923.76
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	8	$16.24
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	1	$114.38
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.	Hour	$20.64	1	$20.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	1	$21.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	4	$120.20
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallon	$3.63	285	$1,034.55
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	$11,661.99	1	$11,661.99
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	200	$70.00

Practice: 316 - Animal Mortality Facility

Scenario #3 - Incineration > 600 lbs. Capacity

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle greater than 600 pounds daily mortality. Typically a single dairy cow or multiple heifers or swine. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. Select smallest incinerator that has a bin capacity to handle largest individual mortality. 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, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. 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).

Before Situation:

Animal mortality is handled 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:

A 600 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is handled 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. An overall plan covers normal and catastrophic mortality events. In non-attainment areas, certain states may require a higher level of processing such as gasification or other approved method. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulations. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers, a waste storage pit until land disposal as per the nutrient management plan or landfilled. Proper incineration will require between 15 and 25 gallons of diesel fuel per usage.

Feature Measure: Each Incinerator

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $16,135.53

Scenario Cost/Unit: $16,135.53

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 Yard	$230.94	4	$923.76
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	8	$16.24
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	1	$114.38
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.	Hour	$20.64	1	$20.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	1	$21.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	4	$120.20
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallon	$3.63	285	$1,034.55
Incinerator, 600 lbs/day	1626	Poultry and livestock incinerator with an approximate chamber capacity of 600 pounds per day. Includes equipment and after burner only.	Each	$13,559.41	1	$13,559.41
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	200	$70.00

Practice: 316 - Animal Mortality Facility

Scenario #6 - Freezer

Scenario Description:

This scenario consists of installing a manufactured freezer to hold animal mortality until all mortality is removed from the farm and handled according to state regulations. Payment made based on the volume of the freezer installed. 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. 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).

Before Situation:

Animal mortality is handled 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 handled 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 removal of the animal mortality to eliminate pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Mortalities are removed by the rendering facility and are carried off site and disposed of according to state regulations. Includes is a concrete slab to set the freezer on.

Feature Measure: Volume of freezer

Scenario Unit:: Cubic Foot

Scenario Typical Size: 65.0

Scenario Total Cost: $6,677.66

Scenario Cost/Unit: $102.73

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 Yard	$230.94	4	$923.76
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	1	$44.85
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	1	$21.00
Materials						
Freezer, animal mortality, small	2052	Freezer to hold animal mortalities until rendering services become available or until treated by other processes. Capacity < 75 cubic feet. Includes labor and equipment.	Each	$5,516.30	1	$5,516.30
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	$171.75	1	$171.75

Practice: 316 - Animal Mortality Facility

Scenario #8 - Small Rotary Drum 270lbs. to 523lbs. of Daily Mortality

Scenario Description:

The system provides a composted material that is 100% contained during the composting process reducing the chance of pathogens and virus contact, especially since the poultry houses are in close proximity to others. Material will be composted and stored for a minimum of 30 days before land application. A small unit can process between 270 and 523 # of daily animal mortality plus equal volume of carbon material (i.e. wood chips). Scenario: 300 lbs. per day of poultry mortality (135,000-5# birds for 90 days @ 4% mortality) plus bulking agent (i.e. wood chips) requires a 300 mortality #/day small drum (22' long) system placed on a concrete pad. A secondary composting storage area is not needed because an approved one meeting NRCS requirements is on site. Payment quantity based on each facility. This scenario shall not be used in conjunction with "Operation Type" scenarios (Nursery, Finisher, Sow, Poultry, and Turkey) that are developed for numerous types of technologies using the least cost alternative and use a Scenario Unit of Pounds Per Day. Associated Practices: Roofs and Covers (367), Waste Storage Facility (313), Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Subsurface Drain (606),and Underground Outlet (620).

Before Situation:

Animal mortality is handled 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 with additional concerns of about influenza A virus. There is limited space for a traditional composting facility and air quality is an additional concern.

After Situation:

A rotary drum system is installed on a concrete pad that contains and composts the daily animal mortality and secretions, allows for continuous temperature management to assure even temperature distribution and protection from predators to minimize pathogen survival or spreading of viruses. An overall plan covers normal and catastrophic mortality events. The secondary composter volume is expected to be 40-60% of the original volume of material and a existing composter area meet's NRCS criteria and specifications. Final product material will be composted and stored for a minimum of 30 days before land application. Additional practices, if needed are Roofs and Covers (367), Heavy Use area Protection (561, Diversion (362), Waste Storage Facilities (313) or Composter (317).

Feature Measure: Each facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $39,029.45

Scenario Cost/Unit: $39,029.45

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 Yard	$230.94	3.7	$854.48
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 Yard	$359.17	0.3	$107.75
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	5.9	$11.98
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	2	$228.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2	$42.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2.93	$88.05
Composter, drum, 12 CY	1627	12 CY drum composter unit. Total capacity range is 10-19 CY. Includes equipment, operation controls, and shipping. Labor not included.	Each	$37,293.06	1	$37,293.06
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	305	$106.75

Practice: 316 - Animal Mortality Facility

Scenario #10 - Large Rotary Drum Greater than 523lbs. of Daily Mortality

Scenario Description:

The system provides a composted material that is 100% contained during the composting process reducing the chance of pathogens and virus contact, especially since the poultry houses are in close proximity to others. A large unit can process more than 523 # of daily animal mortality or more plus equal volume of carbon material (i.e. wood chips). Final compost material will be composted and stored for a minimum of 30 days before land application. Scenario: 750 lbs. per day of poultry mortality (270,000-5# birds for 90 days @ 5% mortality) plus bulking agent (i.e. wood chips) requires a 750 mortality #/day drum system placed on a concrete pad. Install a mechanical, horizontal continuous flow, completely contained, large rotary drum to compost poultry mortality. It can process more than 750 # of daily animal mortality plus equal volume of carbon material (i.e. wood chips). A secondary composting storage area is not needed because an approved one meeting NRCS requirements is on site. Payment quantity based on each facility. This scenario shall not be used in conjunction with "Operation Type" scenarios (Nursery, Finisher, Sow, Poultry, and Turkey) that are developed for numerous types of technologies using the least cost alternative and use a Scenario Unit of Pounds Per Day. Associated Practices: Roofs and Covers (367), Waste Storage Facility (313), Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Subsurface Drain (606),and Underground Outlet (620).

Before Situation:

Animal mortality is handled 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 with additional concerns of about influenza A virus. There is limited space for a traditional composting facility and air quality is an additional concern.

After Situation:

A rotary drum system is installed on a concrete pad that contains and composts the daily animal mortality and secretions, allows for continuous temperature management to assure even temperature distribution and protection from predators to minimize pathogen survival or spreading of viruses. An overall plan covers normal and catastrophic mortality events. The secondary composter volume is expected to be 40-60% of the original volume of material and a existing composter area meet's NRCS criteria and specifications. Final product material will be composted and stored for a minimum of 30 days before land application. Additional practices, if needed are Roofs and Covers (367), Heavy Use area Protection (561, Diversion (362), Waste Storage Facilities (313) or Composter (317).

Feature Measure: Each facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $53,073.52

Scenario Cost/Unit: $53,073.52

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 Yard	$230.94	7.84	$1,810.57
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	9	$3,232.53
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	12	$24.36
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	2	$228.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2	$42.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	6.2	$186.31
Composter, drum, 28 CY	1628	28 CY drum composter unit. Total capacity range is 20-29 CY. Includes equipment, operation controls, and shipping. Labor not included.	Each	$47,086.11	1	$47,086.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	475	$166.25

Practice: 316 - Animal Mortality Facility

Scenario #12 - Static Bin Composter

Scenario Description:

This scenario consists of installing a Static Bin Composter to compost mortality that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle and then the compost is stored for a period of time prior to final land application. This system is for static bin composting of poultry and other mortality when primary and secondary bin size is adjusted to accommodate for the operator's equipment width and access needs thus allowing each state to select the specific scenario which most closely represents their need. Size of facility is based on daily mortality and sizing procedures accepted in particular state. 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. This scenario is developed for use by States that require a composter scenario with a Scenario Feature Measure of Floor Area and a Scenario Unit of Square Feet. This scenario shall not be used in conjunction with "Operation Type" scenarios (Nursery, Finisher, Sow, Poultry, and Turkey) that are developed for numerous types of technologies using the least cost alternative and use a Scenario Unit of Pounds Per Day. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled 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 handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary and secondary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for tertiary treatment and raw material storage. A Broiler operation consists of a 44000 head operation, average bird weight of 4 pounds, 6 flocks per year, and a mortality rate of 5%. The average daily mortality loss (ADL) is 145 lb/day and a primary stage composting time of 14 days is based on 5 times the square root of the maximum weight . The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 409 ft3. Using a 10' x 8' x 5' bin with a volume of 400 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. This small operation requires a total of 4 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Site preparation includes topsoil removal and grading, installing 6" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

Feature Measure: Nominal floor area of bins plus stor

Scenario Unit:: Square Foot

Scenario Typical Size: 945.0

Scenario Total Cost: $18,235.26

Scenario Cost/Unit: $19.30

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 Yard	$113.81	6	$682.86
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$230.94	18	$4,156.92
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	110	$253.00
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 Yard	$2.03	806	$1,636.18
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	175	$672.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	175	$551.25
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	17	$124.95
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	17	$423.47
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.	Hour	$20.64	120	$2,476.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	17	$357.00

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.	Hour	$106.41	20	$2,128.20
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	18	$540.90
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$0.92	2409	$2,216.28
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	816	$1,101.60
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	900	$315.00

Practice: 317 - Composting Facility

Scenario #1 - Less than 500 SF Concrete floor with Wood or Concrete walls

Scenario Description:

A passive composting facility, with concrete under bins, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for soil and crop quality. Scenario: A composter designed to compost manure from a small poultry operation resulting in composters (4-6'L*8'W*5'H bins) and a secondary treatment area (8'x32") for a total treatment area of 14'x32' or 448 SF. The bins have 4' wood walls placed on a 1.0'H * 6" thick reinforced curb. Material is picked up with a front end loader and transferred over the end wall to secondary area for further composting. The secondary bins are closed in on the ends with similar walls. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Animal Mortality Facility (316), 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).

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 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:

Structure installed and 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, typically in accordance with a nutrient management plan.

Feature Measure: Total Bin Capacity

Scenario Unit:: Square Foot

Scenario Typical Size: 448.0

Scenario Total Cost: $6,206.50

Scenario Cost/Unit: $13.85

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 Yard	$113.81	1.3	$147.95
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$230.94	6.9	$1,593.49
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	1.5	$538.76
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	8.3	$16.85
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	4.2	$16.13
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	3	$134.55
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	3	$22.05
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.	Hour	$20.64	80	$1,651.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	5.6	$168.28
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$0.92	1052	$967.84
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	288	$388.80
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	$70.51	1	$70.51

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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 317 - Composting Facility

Scenario #2 - Greater Than or Equal to 500 SF Concrete Floor and Wood Bin Walls

Scenario Description:

A passive composting facility, with concrete under bins, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. Scenario: A composter is designed to compost litter from a 6-(50'*500') poultry houses. The composter is installed on a 40'x56' concrete pad with 5 primary (6' (L) x 8' (W) x 5' (H)) double wall composting bins and one long secondary/storage bin (40'(L) x 50'(W) x5') on the back side of the primary bins.. Typical bin wall consists 5' high treated lumber. Site preparation includes topsoil removal 0.5' plus shaping 0.5' for an average of 1.0), installing setting posts, installing 5" thick concrete slab on top of 4" gravel, and installing wooden walls. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Animal Mortality Facility (316), 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).

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 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:

Structure installed and 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, typically in accordance with a nutrient management plan.

Feature Measure: Composter Footprint

Scenario Unit:: Square Foot

Scenario Typical Size: 2,240.0

Scenario Total Cost: $15,552.01

Scenario Cost/Unit: $6.94

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 Yard	$113.81	2	$227.62
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$230.94	34.5	$7,967.43
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	83	$168.49
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	41.5	$159.36
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	4.5	$201.83
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	4.5	$33.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	120	$2,476.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4.5	$94.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	27.6	$829.38
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$0.92	2280	$2,097.60
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	432	$583.20
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	$70.51	1	$70.51

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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 317 - Composting Facility

Scenario #3 - 500 SF or Greater, Concrete floor with Concrete Bin Wall

Scenario Description:

A passive organic composting facility, with concrete floor, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. Scenario: The organic (cannot use pressure treated wood for storage) composter is designed to compost litter from a 6-(50'*500') poultry houses. The composter is installed on a 40'x56' concrete pad with 5 primary (6' (L) x 8' (W) x 5' (H)) concrete wall composting bins and one long secondary/storage bin (40'(L) x 50'(W) x5') on the back side of the primary bins.. Non-pressure treated, but painted and sealed wood gates are attached to the concrete wall on the composters to keep small animals out and for safety. Site preparation includes topsoil removal 0.5' plus shaping 0.5' for an average of 1.0), costs include installing 5" thick concrete slab on top of 4" gravel and concrete walls (8"*x5'H*6'L). All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Animal Mortality Facility (316), 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).

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 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:

Structure installed and 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, typically in accordance with a nutrient management plan.

Feature Measure: Composter Footprint

Scenario Unit:: Square Foot

Scenario Typical Size: 2,240.0

Scenario Total Cost: $24,305.13

Scenario Cost/Unit: $10.85

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 Yard	$230.94	34.5	$7,967.43
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	31.5	$11,313.86
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	83	$168.49
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	41.5	$159.36
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.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	68	$1,403.52
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	27.6	$829.38
Lumber, planks, posts and timbers, untreated	1623	Untreated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.11	400	$444.00
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 i	Dollar	$1.02	1380	$1,407.60
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 317 - Composting Facility

Scenario #4 - Windrow, compacted earth floor

Scenario Description:

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), 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).

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 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. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. 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 deposal, typically land application. Typical pad 90' x 363' (3/4 acre) 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 removal and re-compaction of top 1' of material.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 32,670.0

Scenario Total Cost: $9,950.99

Scenario Cost/Unit: $0.30

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 Yard	$3.84	1210	$4,646.40
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	1210	$4,561.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 317 - Composting Facility

Scenario #5 - Windrow, gravel floor

Scenario Description:

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. 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. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), 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).

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 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 properly, 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 is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. 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 deposal, typically land application. Typical pad 90' x 363' (3/4 acre) 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 (0.5'), excavation and re-compaction of subsoil (1'), placement of geosynthetic material, and installing 6" of compacted gravel.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 32,670.0

Scenario Total Cost: $39,003.35

Scenario Cost/Unit: $1.19

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	$2.30	3630	$8,349.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	1210	$4,646.40
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	1815	$6,842.55
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	605	$18,180.25
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	$70.51	1	$70.51
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 317 - Composting Facility

Scenario #6 - Windrow, concrete floor

Scenario Description:

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), 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).

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 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 properly, 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 is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a reinforced concrete pad over compacted gravel 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 deposal, typically land application. Typical pad (60' x 100') on a reinforced concrete pad. Sub base consists of compacted gravel. 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 (0.5'), placement of compacted gravel (4"), and installing 5" of reinforced concrete.

Feature Measure: Square Foot Floor Area

Scenario Unit:: Square Foot

Scenario Typical Size: 6,000.0

Scenario Total Cost: $24,866.30

Scenario Cost/Unit: $4.14

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 Yard	$230.94	93	$21,477.42
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	111.5	$420.36
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	74.5	$2,238.73
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	1	$70.51
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	$171.75	1	$171.75
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 319 - On-Farm Secondary Containment Facility

Scenario #1 - Concrete or Masonry Containment Wall

Scenario Description:

This practice scenario includes the installation of a reinforced concrete or masonry 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 10,000 gallon tank. The containment volume is designed for 125% of the tank volume (10000 gallons X 125% = 12500 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. Typical containment dimensions are 668 sqft bottom x 6" thick slab with 8" 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: Surface Area of Floor

Scenario Unit:: Square Foot

Scenario Typical Size: 668.0

Scenario Total Cost: $10,324.09

Scenario Cost/Unit: $15.46

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 Yard	$230.94	14	$3,233.16
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 Yard	$359.17	11	$3,950.87
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	17	$86.19
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.	Hour	$63.09	4	$252.36
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hour	$92.03	2	$184.06
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	16	$430.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	6	$149.10
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	17	$510.85
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	30	$41.40
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	100	$125.00
Fuel Containment Facility, Gate valve 2 inch diameter	1735	Metal 2 inch diameter gate valve. Materials only.	Each	$277.66	1	$277.66
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	$70.51	1	$70.51

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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 319 - On-Farm Secondary Containment Facility

Scenario #2 - 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 10000 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:: Gallon

Scenario Typical Size: 10,000.0

Scenario Total Cost: $10,739.86

Scenario Cost/Unit: $1.07

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.	Hour	$92.03	2	$184.06
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
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.	Gallon	$0.98	10000	$9,800.00
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 319 - On-Farm Secondary Containment Facility

Scenario #3 - 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 side slopes. 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: Square Foot of Liner, bottom dime

Scenario Unit:: Square Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $5,384.85

Scenario Cost/Unit: $5.61

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 Yard	$3.84	126	$483.84
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	114	$359.10
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hour	$92.03	2	$184.06
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.	Hour	$20.64	4	$82.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	18	$540.90
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	50	$69.00
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	208	$917.28
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.50	208	$1,352.00
Fuel Containment Facility, Gate valve 2 inch diameter	1735	Metal 2 inch diameter gate valve. Materials only.	Each	$277.66	1	$277.66
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 325 - High Tunnel System

Scenario #21 - High Tunnel, Low Snow and Wind Load

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit:: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $8,442.24

Scenario Cost/Unit: $3.91

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.	Hour	$20.64	71	$1,465.44
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 Foot	$3.23	2160	$6,976.80

Practice: 325 - High Tunnel System

Scenario #22 - High Tunnel, Low Wind or Snow Load, Intensive Sun

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Because of extensive sun intensity, shade cloth is provided. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484)

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor. High sun intensity shortens growing season, or decreases crop quality.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Shade cloth protects crops from high intensity of sun, allowing crop production and quality to continue into summer months. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit:: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $9,557.04

Scenario Cost/Unit: $4.42

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.	Hour	$20.64	71	$1,465.44
Materials						
Hoop House, quonset style, with shade cloth	2636	Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, polylock for sides and ends, and knitted shade cloth for a quonset style (round top) hoop house in southern climates. Materials and shipping only, does not include labor.	Square Foot	$3.51	2160	$7,581.60
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 i	Dollar	$1.02	500	$510.00

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Tennessee

Practice: 325 - High Tunnel System

Scenario #23 - Contiguous US Snow (Gothic style peaked roof)

Scenario Description:

Used for contiguous US states in areas with high snowfall. A gothic style (peaked) manufactured frame of tubular steel (30 x 70 ft.) covered with 4-year 4 mil 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, and plant condition.

After Situation:

A high tunnel structure has been installed and he growing season has been extended for 1-4 months on average. Plant health and vigor has been improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit:: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $11,045.94

Scenario Cost/Unit: $5.11

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.	Hour	$20.64	71	$1,465.44
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 Foot	$4.40	2160	$9,504.00
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 i	Dollar	$1.02	75	$76.50

Practice: 325 - High Tunnel System

Scenario #24 - Contiguous US (Quonset style rounded roof)

Scenario Description:

Used for contiguous US states in areas with low snowfall. A Quonset style (rounded) manufactured frame of tubular steel (30 x 70 ft.) covered with 4-year 4 mil 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, and plant condition.

After Situation:

A Quonset style high tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor has been improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit:: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $8,442.24

Scenario Cost/Unit: $3.91

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.	Hour	$20.64	71	$1,465.44
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 Foot	$3.23	2160	$6,976.80

Practice: 326 - Clearing and Snagging

Scenario #2 - Clearing and Snagging - Medium

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on 200 to 400 linear feet of a 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-half of the channel flow capacity is obstructed. The flow blockage may encourage deposition 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 equilibrium with the flow.

Feature Measure: Linear Feet

Scenario Unit:: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $3,679.50

Scenario Cost/Unit: $12.27

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.	Hour	$114.38	12	$1,372.56
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	12	$538.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	24	$105.36
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.	Hour	$20.64	24	$495.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	24	$504.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $8,082.50

Scenario Cost/Unit: $161.65

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.	Acre	$11.20	150	$1,680.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	50	$332.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.65	50	$1,032.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	50	$1,074.00
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	$0.57	2500	$1,425.00
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	$0.48	2000	$960.00
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	50	$1,578.50

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $9,381.50

Scenario Cost/Unit: $187.63

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.	Acre	$11.20	150	$1,680.00
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.65	100	$2,065.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	50	$1,074.00
Materials						
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	$91.25	50	$4,562.50

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,048.39

Scenario Cost/Unit: $1,048.39

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.	Acre	$11.20	3	$33.60
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.65	2	$41.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Six Species Mix, Native Forb	2334	Native forb mix. Includes material and shipping only.	Acre	$952.01	1	$952.01

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,481.97

Scenario Cost/Unit: $1,481.97

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.	Acre	$11.20	3	$33.60
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.65	2	$41.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Specialized native grass and forb mix	2619	A mix of native grass and forbs to be used for specialized purposes such as wildlife (including pollinators) or ecosystem restoration, requiring species not readility available and/or difficult to produce and harvest. Includes material and shipping only	Acre	$989.71	1.4	$1,385.59

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,149.90

Scenario Cost/Unit: $11.50

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.	Hour	$38.33	30	$1,149.90

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,533.20

Scenario Cost/Unit: $30.66

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.	Hour	$38.33	40	$1,533.20

Practice: 328 - Conservation Crop Rotation

Scenario #63 - Rice Residue Management for Waterfowl

Scenario Description:

The resource concern is food and cover for waterfowl where rice is grown in the waterfowl flyway zones. This scenario manages the rice residue after rice harvest to enhance the food and cover for waterfowl. The payment for the practice scenario is based on the cost to roll alternate strips of rice residue flat while leaving the alternate strips of rice residue left undisturbed after rice harvest.

Before Situation:

The typical situation after rice harvest is tilling the soil to bury or mix the rice residue remaining after harvest into the soil. This results in virtually no food or cover for the waterfowl that traverse the waterfowl flyways.

After Situation:

The rice residue after rice harvest will remain standing except for the alternate strip of the rice residue rolled almost flat to provide alternate strip of both cover and food. The rice residue will be left in this condition until the following spring.

Feature Measure: Residue Cover

Scenario Unit:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $387.00

Scenario Cost/Unit: $3.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	50	$387.00

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,022.00

Scenario Cost/Unit: $20.22

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.	Acre	$21.48	50	$1,074.00
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acre	$18.96	50	$948.00

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

Scenario #3 - No Till Adaptive Management

Scenario Description:

The practice scenario is for the implementation of no till in small replicated plots to allow the producer to learn how to manage no till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular no till management strategy (e.g., no till vs conventional till, drill vs planter, strip till vs no till, residue row cleaners, vs no row cleaners, etc.) This will be done by following the Agronomy Technical Note 10 - Adaptive Management.

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 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 exceeds soil loss tolerances. 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). The producer is considering using no till technology, but is unsure how to manage on their operation or needs to improve the management of no till to be successful.

After Situation:

Implementation Requirements are prepared and an Adaptive Management Plan for the plots is developed and implemented. Installation of this scenario will result in establishment of no till replicated plots to compare to different management strategies for no till and other residue management strategies following the guidance in the Agronomy Technical Note 10 - Adaptive Management Process. Implementation involves establishing the replicated plots to evaluate one or more no till 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 no till management. Results are used to make no till management decisions to address erosion, soil health, 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 15 acre plots

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,257.10

Scenario Cost/Unit: $3,257.10

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.	Acre	$21.48	7.5	$161.10
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acre	$18.96	7.5	$142.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
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.	Hour	$106.41	20	$2,128.20

Practice: 330 - Contour Farming

Scenario #1 - 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 slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

Implementation Requirements are prepared and implemented according to 330 Contour Farming. 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 operators are properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has been significantly reduced.

Feature Measure: acre

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $241.90

Scenario Cost/Unit: $8.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	3	$114.99

Practice: 332 - Contour Buffer Strips

Scenario #27 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $510.52

Scenario Cost/Unit: $510.52

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	1	$395.56
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	1	$68.44

Practice: 332 - Contour Buffer Strips

Scenario #28 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $509.05

Scenario Cost/Unit: $509.05

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	1	$395.56
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	$0.42	30	$12.60
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	$0.48	20	$9.60
Sulfate of Potash	263	Approved for Organic Systems - Muriate of Potash	Pound	$0.66	20	$13.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	1	$31.57

Practice: 332 - Contour Buffer Strips

Scenario #29 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $655.30

Scenario Cost/Unit: $655.30

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	1	$395.56
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	1	$213.22

Practice: 332 - Contour Buffer Strips

Scenario #30 - Native, Foregone Income-High Value Cropland

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 buffer strips 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. Specialty crops for market are produced on this acreage. 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,226.07

Scenario Cost/Unit: $1,226.07

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	$1,111.11	1	$1,111.11
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	1	$68.44

Practice: 332 - Contour Buffer Strips

Scenario #31 - Introduced-High Value Cropland

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 introduced species. The area of the field border 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. Specialty crops for market are grown in this 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,224.60

Scenario Cost/Unit: $1,224.60

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	$1,111.11	1	$1,111.11
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	$0.42	30	$12.60
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	$0.48	20	$9.60
Sulfate of Potash	263	Approved for Organic Systems - Muriate of Potash	Pound	$0.66	20	$13.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	1	$31.57

Practice: 332 - Contour Buffer Strips

Scenario #32 - Wildlife/Pollinator-High Value Cropland

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.

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. Specialty crops for market are grown in this 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. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to the 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,370.85

Scenario Cost/Unit: $1,370.85

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	$1,111.11	1	$1,111.11
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	1	$213.22

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario #1 - Gypsum greater than 1 ton rate

Scenario Description:

Gypsum application of more than one ton/acre rate (typical average 1.5 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and supervisor/management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content with application of manure with a risk of pathogens. Soil in these fields has poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have a high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field based on the existing soil samples will result in reduced runoff and improved runoff water quality. This condition over time in combination with an implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum product appli

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,520.93

Scenario Cost/Unit: $63.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	40	$427.60
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.	Hour	$38.33	1	$38.33
Materials						
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only.	Ton	$34.25	60	$2,055.00

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario #2 - Gypsum less than 1 ton per acre

Scenario Description:

Gypsum application of less than or equal to one ton/acre rate (typical average 1 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). . The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content. Soil in these fields have poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field is based on the existing soil samples and will result in reduce runoff and improve runoff water quality. This condition over time in combination with the implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum product appli

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,493.43

Scenario Cost/Unit: $37.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	40	$427.60
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.	Hour	$38.33	1	$38.33
Materials						
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only.	Ton	$34.25	30	$1,027.50

Practice: 338 - Prescribed Burning

Scenario #1 - Understory Burn

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. An Understory 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 also must reduce litter and debris. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios) Existing firebreaks are cleared of combustible debris or vegetation prior to ignition of fire using labor and hand tools. A bulldozer is brought on site and held in standby mode for suppression contingencies until the burn site is safe to leave unsupervised. Burn sites are monitored the next day for remaining hot spots and or spot over fire.

Before Situation:

Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present. Existing firebreaks are in various states of O&M and must be 'refreshed' prior to the prescribed burn. Hand raking to protect 'snags' and tie firebreaks into riparian areas and other sensitive areas is done where required.

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.

Feature Measure: Acres planned

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,254.57

Scenario Cost/Unit: $56.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
Dozer, 105 HP	1320	Track mounted Dozer with horsepower range of 90 to 125. Equipment and power unit costs. Labor not included.	Hour	$84.85	1	$84.85
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	$2.44	8	$19.52
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.	Hour	$26.89	24	$645.36
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.	Hour	$38.33	8	$306.64
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.	Hour	$106.41	4	$425.64
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	$4.39	10	$43.90
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 340 - Cover Crop

Scenario #1 - Cover Crop - Basic

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,377.60

Scenario Cost/Unit: $84.44

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.	Acre	$6.17	40	$246.80
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	40	$859.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	40	$754.80
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	40	$1,516.80

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: Area planted

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,350.70

Scenario Cost/Unit: $2,350.70

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.	Acre	$6.17	10	$61.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	10	$214.80
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.	Hour	$26.89	20	$537.80
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.	Hour	$20.64	40	$825.60
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.	Acre	$18.87	10	$188.70
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	10	$522.10

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,949.20

Scenario Cost/Unit: $98.73

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.	Acre	$6.17	40	$246.80
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	40	$859.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	40	$754.80
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	40	$2,088.40

Practice: 342 - Critical Area Planting

Scenario #1 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $218.36

Scenario Cost/Unit: $218.36

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.	Acre	$11.20	2	$22.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
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	$0.42	30	$12.60
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	$0.48	60	$28.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	60	$21.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	2	$65.52
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	1	$31.57

Practice: 342 - Critical Area Planting

Scenario #4 - Native and Introduced Vegetation - Moderate Grading

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $590.11

Scenario Cost/Unit: $590.11

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.	Hour	$66.50	4	$266.00
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	2	$22.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
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	$0.42	30	$12.60
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	$0.48	60	$28.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	60	$21.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	2	$65.52
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	1	$37.92

Practice: 342 - Critical Area Planting

Scenario #6 - Native or Introduced Grass/legume mix-heavy grading (Organic and Non-organic)

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe 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 moderate to severe gullies averaging 3 feet in depth and 3 feet in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

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 moderate to severe 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $969.80

Scenario Cost/Unit: $969.80

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.	Hour	$66.50	8	$532.00
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	2	$22.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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	$0.42	30	$12.60
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	$0.48	60	$28.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	60	$21.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	2	$65.52
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	1	$52.21

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,148.00

Scenario Cost/Unit: $21.48

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.	Acre	$21.48	100	$2,148.00

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario #3 - Mulch till-Adaptive Management

Scenario Description:

The practice scenario is for the implementation of mulch till in small replicated plots to allow the producer to learn how to manage mulch till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular mulch till management strategy (e.g., mulch till vs. conventional till, two different mulch till systems, etc.). This will be done following the guidelines outlined in Agronomy 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. Erosion exceeds soil loss tolerances. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring prior to planting. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil. The producer is considering using mulch till technology, but is unsure how to manage on their operation or needs to improve the management of mulch till to be successful.

After Situation:

Implementation Requirements and the Adaptive Management Plan is prepared for the plots and implemented. Installation of this scenario will result in establishment of mulch till replicated plots to compare to different management strategies for mulch till and other residue management strategies following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management and the Adaptive Management Guidance 345 for Mulch Till. Implementation involves establishing the replicated plots to evaluate one or more reduced till management strategies. The plot will consist of at least four replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in reduced till management. Results are used to make reduced till management decisions to address erosion, soil health, 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 and residue levels measured as needed. This practice will be repeated for three years.

Feature Measure: Area planted

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,916.20

Scenario Cost/Unit: $3,916.20

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.	Acre	$11.20	20	$224.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	20	$334.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	10	$214.80
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acre	$18.96	10	$189.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
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.	Hour	$106.41	20	$2,128.20

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario #45 - Reduced Till Sweep for No Burn/Sweep Beds - Sugarcane Production in Louisiana

Scenario Description:

In this scenario, sugarcane producers will be migrating from a system of burning residue immediately after harvest in the fall and winter to a system that discontinues burning and allows residue to be swept into furrows. No burning will take place during the management period. Adopting this system will improve soil quality, reduce erosion, and improve air quality in sensitive areas.

Before Situation:

Sugarcane residue is typically burned immediately after harvest in the fall and early winter. After burning, beds may be reshaped with tillage. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible signs of soil erosion by spring. Sensitive receptors near sugarcane fields will be exposed to increased particulate matter and degraded air quality during burning events.

After Situation:

After harvest in the fall or winter, residue will be swept from the sugarcane row tops into the furrows. Residue will not be burned. In the early spring, row reshaping (off-bar and lay-by tillage) will occur as necessary. Over time, soil health is improved due to the additional crop residues, ground cover, and soil infiltration.

Feature Measure: Acres

Scenario Unit:: Acre

Scenario Typical Size: 200.0

Scenario Total Cost: $3,340.00

Scenario Cost/Unit: $16.70

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.	Acre	$16.70	200	$3,340.00

Practice: 350 - Sediment Basin

Scenario #1 - Excavated Basin

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

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

After Situation:

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

Feature Measure: Excavated volume

Scenario Unit:: Cubic Yard

Scenario Typical Size: 1,500.0

Scenario Total Cost: $3,695.46

Scenario Cost/Unit: $2.46

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.	Hour	$124.72	23	$2,868.56
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	23	$571.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 350 - Sediment Basin

Scenario #3 - Embankment earthen basin with pipe

Scenario Description:

An low hazard class embankment earthen 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 lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. 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 25 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 Yard

Scenario Typical Size: 1,500.0

Scenario Total Cost: $7,447.45

Scenario Cost/Unit: $4.96

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 Yard	$359.17	3	$1,077.51
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	23	$2,868.56
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	23	$571.55
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	19.6	$581.14
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	1.6	$48.08
Pipe, CMP, 18-16 gauge, weight priced	1322	18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.94	1662	$1,562.28
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	$2.27	118	$267.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 351 - Well Decommissioning

Scenario #1 - Shallow Well less than 20ft deep

Scenario Description:

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

Before Situation:

Shallow well or hand dug well that is less than 20 feet deep. Assume 30" diameter casing. 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.

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. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit:: Foot

Scenario Typical Size: 15.0

Scenario Total Cost: $2,204.61

Scenario Cost/Unit: $146.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	2.7	$13.69
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	1	$56.37
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$15.71	1	$15.71
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	2	$53.78
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	$669.22	2.7	$1,806.89
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.82	1	$2.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 351 - Well Decommissioning

Scenario #2 - Shallow Well greater than 20ft deep

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:

Shallow or hand dug well that is greater than 30 feet deep. Assume 30" diameter casing.

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. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit:: Foot

Scenario Typical Size: 30.0

Scenario Total Cost: $4,198.70

Scenario Cost/Unit: $139.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	5.5	$27.89
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	2	$112.74
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$15.71	1	$15.71
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	2	$53.78
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	$669.22	5.5	$3,680.71
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.82	1	$2.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

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Practice: 351 - Well Decommissioning

Scenario #3 - Drilled well

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:

Drilled well, any depth, typical is 400'. Assume 6" diameter casing.

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. Associated practices: 342 Critical Area Seeding

Feature Measure: Each well decommissioned

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,526.49

Scenario Cost/Unit: $3,526.49

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.	Hour	$56.37	3	$169.11
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	2	$133.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$15.71	3	$47.13
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	4	$107.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	4	$82.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	5	$124.25
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2	$60.10
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	$669.22	3	$2,007.66
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.82	3	$8.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
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	$0.35	100	$35.00

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: $54.42

Scenario Cost/Unit: $54.42

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.	Hour	$20.64	0.5	$10.32
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	$44.10	1	$44.10

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: $226.88

Scenario Cost/Unit: $226.88

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.	Hour	$20.64	0.5	$10.32
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	$44.10	1	$44.10
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	$172.46	1	$172.46

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: $277.16

Scenario Cost/Unit: $277.16

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.	Hour	$20.64	0.5	$10.32
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	$44.10	1	$44.10
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	$222.74	1	$222.74

Practice: 356 - Dike

Scenario #1 - Material haul < 1 mile

Scenario Description:

Construction of a barrier, constructed of an earthen embankment, to control water level. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Material haul < 1 mile. 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.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance. Material haul < 1 mile.

After Situation:

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

Feature Measure: Volume of Earthfill (including volu

Scenario Unit:: Cubic Yard

Scenario Typical Size: 4,500.0

Scenario Total Cost: $28,771.43

Scenario Cost/Unit: $6.39

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 Yard	$2.03	4500	$9,135.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	4500	$17,280.00
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.	Hour	$106.41	6	$638.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	3	$1,462.62

Practice: 356 - Dike

Scenario #2 - Material haul > 1 mile

Scenario Description:

Construction of a barrier, constructed of an earthen embankment, to control water level. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Material haul > 1 mile. 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.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance. Material haul > 1 mile.

After Situation:

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

Feature Measure: Volume of Earthfill (including volu

Scenario Unit:: Cubic Yard

Scenario Typical Size: 4,500.0

Scenario Total Cost: $31,741.43

Scenario Cost/Unit: $7.05

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 Yard	$2.03	4500	$9,135.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	4500	$17,280.00
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	$0.33	9000	$2,970.00
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.	Hour	$106.41	6	$638.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	3	$1,462.62

Practice: 360 - Waste Facility Closure

Scenario #1 - Poultry House Soil Remediation

Scenario Description:

This practice scenario includes the remediation of the soil in an abandoned poultry structures previously used to store poultry waste (litter) on an earthen floor. 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. Associated practices: Nutrient Management (590), Critical Area Planting (342).

Before Situation:

The abandoned poultry house has a damaged roof exposing the earthen floor of the structure to rainfall. 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 only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched soil found in the first 7 inches of soil beneath the litter floor and mixing wood chips with the remaining 5 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 remaining 5 inches of 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. Additional soil will be hauled in (estimated at 110% of the soil volume that was removed for field application) to backfill the depression. 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 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.

Feature Measure: Cubic feet of soil remediated

Scenario Unit:: Cubic Foot

Scenario Typical Size: 16,000.0

Scenario Total Cost: $11,903.11

Scenario Cost/Unit: $0.74

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 Yard	$3.15	380	$1,197.00
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.	Hour	$114.38	31	$3,545.78
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hour	$113.31	19	$2,152.89
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	1	$58.02
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yard	$20.59	82	$1,688.38
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.	Hour	$94.20	6	$565.20
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	1	$21.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	31	$770.35
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	16	$163.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	3	$766.05
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	2	$975.08

Practice: 360 - Waste Facility Closure

Scenario #2 - Feedlot Closure

Scenario Description:

This practice scenario includes the remediation of the soil on an abandoned feedlot previously used to feed animals on a bare earthen lot. 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. Associated practices: Nutrient Management (590), Critical Area Planting (342).

Before Situation:

The feedlot is abandoned. Vegetation has not been reestablished. The high level of nutrients in the soil is preventing volunteer establishment of native vegetation. 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 averages 8 inches in depth and the level of nutrients in the 4 inches of soil below the manure pack is too high to treat in situations with vegetation. Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include 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. Fence and feed bunk removal is to be performed under Obstruction Removal, Code 500.

Feature Measure: Cubic feet of soil remediated

Scenario Unit:: Cubic Foot

Scenario Typical Size: 130,680.0

Scenario Total Cost: $36,723.65

Scenario Cost/Unit: $0.28

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.	Hour	$114.38	40	$4,575.20
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hour	$113.31	269	$30,480.39
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	40	$994.00
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	16	$163.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 360 - Waste Facility Closure

Scenario #3 - Demolition of Concrete Waste Storage Structure

Scenario Description:

This practice scenario includes the demolition of a concrete waste storage structure. 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. Associated practices: Nutrient Management (590), Critical Area Planting (342)

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, the concrete floor is 5 inches thick and the footing for the wall is 12 inches wide by 24 inches deep. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet ([2 X (60 ft + 60 ft) X 8in /12 in/ft] + [60 ft X 60 ft X 5in /12 in/ft] + [2 X (60 ft + 60 ft) X 12in /12 in/ft X 24in /12in/ft]). The volume of waste to be removed approximately equals 50% of the structural volume (50% X 36,000 = 18,000 CF). 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. Demolition of a concrete waste storage structure includes agitating, removing, and spreading the waste remaining in the structure. 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.

Feature Measure: Cubic Feet of concrete to be demol

Scenario Unit:: Cubic Foot

Scenario Typical Size: 3,580.0

Scenario Total Cost: $8,813.48

Scenario Cost/Unit: $2.46

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 Yard	$3.84	667	$2,561.28
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.	Hour	$114.38	10	$1,143.80
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	134640	$1,346.40
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	133	$1,359.26
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	$0.33	1330	$438.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	4	$1,021.40
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 360 - Waste Facility Closure

Scenario #6 - Liquid Waste Impoundment Closure with 50% Liquids and 50% Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. 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. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

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

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% if the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. 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). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. 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.

Feature Measure: Cubic feet of structural storage

Scenario Unit:: Cubic Foot

Scenario Typical Size: 63,851.0

Scenario Total Cost: $18,967.75

Scenario Cost/Unit: $0.30

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 Yard	$2.03	709	$1,439.27
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	473	$1,816.32
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.	Hour	$114.38	12	$1,372.56
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	238803	$2,388.03
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.31	31925	$9,896.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	12	$247.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	12	$298.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	4	$1,021.40
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 360 - Waste Facility Closure

Scenario #10 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 50% Liquids and 50% Solids

Scenario Description:

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. 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. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

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

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% of the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. 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. Conversion of a liquid waste storage impoundment for fresh water storage 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). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

Feature Measure: Cubic feet of structural storage

Scenario Unit:: Cubic Foot

Scenario Typical Size: 63,851.0

Scenario Total Cost: $15,525.80

Scenario Cost/Unit: $0.24

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 Yard	$3.84	118	$453.12
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	8	$915.04
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	238803	$2,388.03
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.31	31925	$9,896.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	4	$1,021.40
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 362 - Diversion

Scenario #1 - Diversion

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. Typical diversion is, 1000 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. 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 agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Diversion is 1000 feet long installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Feature Measure: Length of Diversion

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,403.29

Scenario Cost/Unit: $2.40

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 Yard	$2.03	1000	$2,030.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 362 - Diversion

Scenario #2 - 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:: Foot

Scenario Typical Size: 50.0

Scenario Total Cost: $1,314.37

Scenario Cost/Unit: $26.29

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 Yard	$359.17	2.8	$1,005.68
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	2.15	$4.36
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	3.7	$18.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	1	$20.64
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.	Hour	$38.33	1	$38.33
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	1.85	$54.85
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	$171.75	1	$171.75

Practice: 367 - Roofs and Covers

Scenario #1 - Post Frame Roof, less than 30ft wide

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. 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), Agrichemical Handling Facility (309), 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 framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 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: Footprint of building

Scenario Unit:: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $9,426.37

Scenario Cost/Unit: $9.43

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 Foot	$9.03	1000	$9,030.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 367 - Roofs and Covers

Scenario #2 - Post Frame Roof, 30-60ft wide

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. 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), Agrichemical Handling Facility (309), 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 framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 4,000 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: Footprint of building

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $34,876.37

Scenario Cost/Unit: $8.72

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 Foot	$8.62	4000	$34,480.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 367 - Roofs and Covers

Scenario #3 - Post Frame Roof, Bedrock Foundation

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation that consists of bedrock. 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), Agrichemical Handling Facility (309), 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 framed building with a timber or steel "sheet" roof and supporting foundation that is installed on bedrock. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 4,000 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: Footprint of building

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $40,297.47

Scenario Cost/Unit: $10.07

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 Yard	$113.81	6	$682.86
Jack Hammer	2190	60-90 pound jack hammer (electric, pneumatic, or hydraulic). Equipment only.	Hour	$2.14	208	$445.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	208	$4,293.12
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 Foot	$8.62	4000	$34,480.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 367 - Roofs and Covers

Scenario #5 - Steel Frame and Roof

Scenario Description:

A steel framed building with steel "sheet" roof and supporting foundation. 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 includes Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), 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 steel framed building with steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 10,000 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: Footprint of building

Scenario Unit:: Square Foot

Scenario Typical Size: 10,000.0

Scenario Total Cost: $70,251.72

Scenario Cost/Unit: $7.03

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 Foot	$6.96	10000	$69,600.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 367 - Roofs and Covers

Scenario #7 - Flexible Roof

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. 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), 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 flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 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: Footprint of the building

Scenario Unit:: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $8,681.72

Scenario Cost/Unit: $8.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Roof, Hoop Truss Arch Structure, less than 30' wide	1667	Hoop Truss Arch Structure with fabric cover - less than 30' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	$8.03	1000	$8,030.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #3 - Plate Cooler

Scenario Description:

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. Practice certification will be through receipts and pictures from the applicant.

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, 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: $5,236.42

Scenario Cost/Unit: $5,236.42

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.	Hour	$26.89	8	$215.12
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	$5,021.30	1	$5,021.30

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #4 - Scroll Compressor

Scenario Description:

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor.

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, 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: $1,250.42

Scenario Cost/Unit: $1,250.42

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.	Hour	$26.89	4	$107.56
Materials						
Scroll Compressor - 2 HP	1181	Scroll compressor, 2 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	$1,142.86	1	$1,142.86

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #7 - Motor Upgrade > 100 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 100 horsepower.

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, 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: Number of motors

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $24,834.03

Scenario Cost/Unit: $24,834.03

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.	Hour	$26.89	4	$107.56
Materials						
Motor, electric, NEMA Premium, 200 HP	1175	Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$24,726.47	1	$24,726.47

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #9 - Motor Upgrade > 1 and < 10 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

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, 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: Number of motors

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $867.69

Scenario Cost/Unit: $867.69

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.	Hour	$26.89	2	$53.78
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	$813.91	1	$813.91

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #10 - Motor Upgrade less than or = 1 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

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, 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: Number of motors

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $525.50

Scenario Cost/Unit: $525.50

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.	Hour	$26.89	1	$26.89
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	$498.61	1	$498.61

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #11 - Heating - Radiant Brooder

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Brood heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench 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 evidenced by the energy audit.

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 heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. 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.

Feature Measure: Number of heaters

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $500.60

Scenario Cost/Unit: $500.60

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.	Hour	$26.89	1	$26.89
Materials						
Heater, radiant brooder	1993	Radiant brooder heater. Materials only.	Each	$473.71	1	$473.71

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #12 - Heating - Radiant Tube

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Tube Heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench 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 evidenced by the energy audit.

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 heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. 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.

Feature Measure: Number of heaters

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,563.97

Scenario Cost/Unit: $1,563.97

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.	Hour	$26.89	1	$26.89
Materials						
Heater, radiant tube	1163	Radiant tube heater rated at 125,000 BTU/hour. Materials only.	Each	$1,537.08	1	$1,537.08

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #13 - Heating - Radiant Quad

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Quad Heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench 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 evidenced by the energy audit.

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 heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. 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.

Feature Measure: Number of heaters

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $964.79

Scenario Cost/Unit: $964.79

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.	Hour	$26.89	1	$26.89
Materials						
Heater, radiant quad	1164	Quad Radiant heater rated at 80,000 BTU/hour. Materials only.	Each	$937.90	1	$937.90

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #15 - Automated Attic Inlets, Heat Recovery vents

Scenario Description:

Install actuated inlets or automatic latching gravity inlets that draw warmer, drier air from the attic to assist with moisture and heat control when ventilation fans are being operated in poultry houses and swine barns. Other systems to transfer heat, as detailed in ASABE S612-compliant energy audit may also be used. Based on a 40' x 500' poultry house.

Before Situation:

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

After Situation:

Attic vents or inlets allow dry warm air from the attic to circulated through out the building. By using pre-warmed air from the attic less energy is needed for heating 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.

Feature Measure: Number of Inlets

Scenario Unit:: Each

Scenario Typical Size: 14.0

Scenario Total Cost: $2,199.79

Scenario Cost/Unit: $157.13

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.	Hour	$26.89	24.5	$658.81
Materials						
Inlet, Attic Ceiling	2414	Poultry house attic air inlets. Includes materials only.	Each	$110.07	14	$1,540.98

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #16 - Grain Dryer

Scenario Description:

A replacement continuous dryer rated for an appropriate rated bushel/per hour capacity for the operation that 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 evidenced by the energy audit. The typical operation requires a rated capacity of 860 bushels per hour.

Before Situation:

Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified inefficient manual control of the dryer where the operator controls the plenum temperature and the discharge auger speed to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The plenum temperature setting depends on the moisture content of crop with a typical value of 220 F. The burner cycles on and off, automatically, as necessary to maintain the plenum temperature selected by the operator.

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. 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.

Feature Measure: Rated capacity of the dryer

Scenario Unit:: Bushel per Hour

Scenario Typical Size: 860.0

Scenario Total Cost: $85,527.12

Scenario Cost/Unit: $99.45

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.	Hour	$26.89	8	$215.12
Materials						
Grain dryer, Axial, 12'	1158	Grain dryer, 12 foot Axial with rated capacity of 460 bushels/hour. Materials only.	Bushel per Hour	$104.57	172	$17,986.04
Grain dryer, Axial, 16'	1159	Grain dryer, 16 foot Axial with rated capacity of 600 bushels/hour. Materials only.	Bushel per Hour	$90.29	172	$15,529.88
Grain dryer, Centrifugal, 20'	1160	Grain dryer, 20 foot Centrifugal with rated capacity of 785 bushels/hour. Materials only.	Bushel per Hour	$96.57	172	$16,610.04
Grain dryer, Centrifugal, 24'	1161	Grain dryer, 24 foot Centrifugal with rated capacity of 860 bushels/hr. Materials only.	Bushel per Hour	$103.43	172	$17,789.96
Grain dryer, Axial 28'	1162	Grain dryer, 28 foot Axial with rated capacity of 990 bushels/hr. Materials only.	Bushel per Hour	$101.14	172	$17,396.08

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #20 - Evaporative cooling system

Scenario Description:

An evaporative cooling system is installed into a facility such as a greenhouse, poultry house or other livestock facility to replace an existing inefficient cooling system, or on a specialty crop farm with an inefficient refrigeration system that is used to quick-cool harvested vegetables, fruits and/or cut flowers;

Before Situation:

An existing cooling system is in place that is inefficient.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium motor. 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.

Feature Measure: Square ft.

Scenario Unit:: Square Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $2,466.56

Scenario Cost/Unit: $24.67

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.	Hour	$26.89	4	$107.56
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 Foot	$23.59	100	$2,359.00

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario #57 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

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, 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: $1,509.40

Scenario Cost/Unit: $1,509.40

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.	Hour	$26.89	8	$215.12
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	$666.86	1	$666.86
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$170.29	1	$170.29
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	$457.13	1	$457.13

Practice: 378 - Pond

Scenario #1 - Excavated Pit

Scenario Description:

A low-hazard water impoundment structure on agricultural lands to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. 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 or irrigation. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

After Situation:

The typical pond is constructed by excavating 3100 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Excavated Volume

Scenario Unit:: Cubic Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $6,238.15

Scenario Cost/Unit: $2.01

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.	Hour	$124.72	40	$4,988.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	40	$994.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 378 - Pond

Scenario #2 - Embankment Pond without Pipe

Scenario Description:

A water impoundment structure on agricultural land to improve water quality or to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical 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 earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit:: Cubic Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $6,470.34

Scenario Cost/Unit: $2.09

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.	Hour	$124.72	40	$4,988.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	40	$994.00
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	$487.54	1	$487.54

Practice: 378 - Pond

Scenario #3 - Embankment Pond with Drop Inlet Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway 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 or irrigation. 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 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 Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $9,716.40

Scenario Cost/Unit: $3.13

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 Yard	$359.17	3	$1,077.51
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	1.6	$3.25
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	48	$5,986.56
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	48	$1,192.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	19.6	$581.14
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	56	$353.92
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	$18.40	8	$147.20
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	$2.27	70	$158.90

USDA - Natural Resources Conservation Service

Tennessee

Practice: 378 - Pond

Scenario #4 - Embankment Pond with Hood Inlet Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a hood inlet 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 or irrigation. 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 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 Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $8,711.46

Scenario Cost/Unit: $2.81

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 Yard	$2.03	1.6	$3.25
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	48	$5,986.56
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	4	$107.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	48	$1,192.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	19.6	$581.14
Pipe, PVC, 8", SCH 80	1350	Materials: - 8" - PVC - SCH 80 - ASTM D1785	Foot	$12.35	40	$494.00
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	$2.27	40	$90.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #1 - 1 row windbreak, shrubs, hand planted

Scenario Description:

Single 500 foot row of shrubs for wind protection, wildlife habitat, or snow management. Shrubs planted by hand 4 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

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

After Situation:

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $245.78

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.	Hour	$21.91	2	$43.82
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	2	$24.72
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.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Shrub, seedling or transplant, bare root, 6-18"	1506	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.46	125	$57.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	20	$1.80

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #2 - 1 row windbreak, trees, hand planted

Scenario Description:

Single 500 foot row of conifer tree seedlings for wind protection, wildlife habitat, or snow management. Trees planted by hand 10 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

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

After Situation:

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $136.54

Scenario Cost/Unit: $0.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	1	$12.36
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.	Hour	$20.64	1	$20.64
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.	Hour	$38.33	1	$38.33
Materials						
Tree, conifer, seedling, containerized, 10 cu. in.	1519	Containerized conifer stock, 10 cubic inches (approx 6" plug), 1.7" x 6"). Includes materials and shipping only.	Each	$0.83	50	$41.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	20	$1.80

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #3 - 2-row windbreak, shrubs, machine planted

Scenario Description:

Two 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Shrubs planted with a tree planting machine 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

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

After Situation:

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:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $252.40

Scenario Cost/Unit: $0.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	1	$24.91
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	1	$7.01
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.	Hour	$20.64	1	$20.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	1	$21.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
Materials						
Shrub, seedling or transplant, bare root, 6-18"	1506	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.46	250	$115.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	40	$3.60

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #4 - 2-row windbreak, trees, machine planted, no tubes

Scenario Description:

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

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

After Situation:

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:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $303.20

Scenario Cost/Unit: $0.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	2	$49.82
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	2	$14.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2	$42.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	100	$32.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	40	$3.60

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #5 - 2-row windbreak, trees, machine planted, with tubes

Scenario Description:

Two 500 foot rows of hardwood tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

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

After Situation:

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:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $765.70

Scenario Cost/Unit: $1.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	2	$49.82
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	2	$14.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2	$42.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	100	$32.00
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	100	$215.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	150	$7.50
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	150	$240.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	40	$3.60

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #6 - 3 or more row windbreak, shrub, machine planted

Scenario Description:

Three or more 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management. Shrubs planted with a tree planting machine, 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

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:

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:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $579.30

Scenario Cost/Unit: $1.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	3	$65.73
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	3	$74.73
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	3	$21.03
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.	Hour	$20.64	3	$61.92
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	3	$114.99
Materials						
Shrub, seedling or transplant, bare root, 6-18"	1506	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.46	375	$172.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	60	$5.40

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #7 - 3 or more tree rows machine planted windbreak, no tubes

Scenario Description:

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 10 feet apart with rows 16 feet apart, planted with a tree planting machine. Herbivores are not expected to browse planted seedlings, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

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:

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:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $328.20

Scenario Cost/Unit: $0.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	2	$49.82
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	2	$14.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	50	$16.00
Tree, conifer, seedling, containerized, 10 cu. in.	1519	Containerized conifer stock, 10 cubic inches (approx 6" plug), 1.7" x 6"). Includes materials and shipping only.	Each	$0.83	100	$83.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	40	$3.60

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario #8 - 3 or more row windbreak, trees, machine planted, with tubes

Scenario Description:

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

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

After Situation:

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:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $891.00

Scenario Cost/Unit: $1.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	2	$49.82
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	2	$14.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2	$42.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	150	$48.00
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	150	$322.50
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	150	$7.50
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	150	$240.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	60	$5.40

Practice: 381 - Silvopasture Establishment

Scenario #1 - Commercial thinning, establish native grasses

Scenario Description:

Commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,785.54

Scenario Cost/Unit: $478.55

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.	Acre	$11.20	10	$112.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	10	$61.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	10	$66.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	10	$106.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
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.	Hour	$106.41	8	$851.28
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	$0.48	500	$240.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	500	$180.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	20	$655.20
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.	Acre	$7.07	10	$70.70
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: 381 - Silvopasture Establishment

Scenario #2 - Commercial thinning, establish introduced grasses

Scenario Description:

Commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legume species will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,132.34

Scenario Cost/Unit: $313.23

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.	Acre	$11.20	10	$112.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	10	$61.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	10	$66.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	10	$106.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
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.	Hour	$106.41	8	$851.28
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	$0.48	500	$240.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	500	$180.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	20	$655.20
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.	Acre	$7.07	10	$70.70
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	10	$479.00

Practice: 381 - Silvopasture Establishment

Scenario #3 - Non-commercial thinning, establish native grasses

Scenario Description:

Non-commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,287.34

Scenario Cost/Unit: $628.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	60	$263.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	10	$112.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	10	$61.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	10	$66.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	10	$106.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
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.	Hour	$20.64	60	$1,238.40
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.	Hour	$106.41	8	$851.28
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	$0.48	500	$240.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	500	$180.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	20	$655.20
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.	Acre	$7.07	10	$70.70
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: 381 - Silvopasture Establishment

Scenario #4 - Non-commercial thinning, establish introduced grasses

Scenario Description:

Non-commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legume species will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,634.14

Scenario Cost/Unit: $463.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	60	$263.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	10	$112.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	10	$61.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	10	$66.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	10	$106.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
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.	Hour	$20.64	60	$1,238.40
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.	Hour	$106.41	8	$851.28
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	$0.48	500	$240.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	500	$180.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	20	$655.20
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.	Acre	$7.07	10	$70.70
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	10	$479.00

Practice: 381 - Silvopasture Establishment

Scenario #7 - Establish hardwood trees and native grasses in an open field

Scenario Description:

Establishment of trees and native grasses into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:

10-acre crop field to be converted to silvopasture. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. Trees will be planted at the proper spacing and arrangement to be managed for silvopasture providing adequate livestock shelter and a commercially viable timber product or tree crop over the long term. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $9,886.36

Scenario Cost/Unit: $988.64

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.	Acre	$11.20	10	$112.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	10	$61.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	10	$66.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	10	$106.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	4	$28.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
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	$0.48	500	$240.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	500	$180.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	20	$655.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	1000	$320.00
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	1000	$4,220.00
Stakes, wood, 3/4" x 3/4" x 48"	1582	3/4" x 3/4" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$1.19	1000	$1,190.00
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: 381 - Silvopasture Establishment

Scenario #8 - Establish conifer trees, introduced grasses and legumes in an open field (typically in a formerly cropped field)

Scenario Description:

Establishment of trees and introduced grasses and legumes into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:

10-acre crop field to be converted to silvopasture. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legumes species will be established, providing forage to livestock and wildlife. Trees will be planted at the proper spacing and arrangement to be managed for silvopasture providing adequate livestock shelter and a commercially viable timber product or tree crop over the long term. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,923.16

Scenario Cost/Unit: $292.32

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.	Acre	$11.20	10	$112.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	10	$61.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	10	$66.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	10	$106.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	4	$28.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
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	$0.48	500	$240.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	500	$180.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	20	$655.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	10	$188.70
Tree, conifer, seedling, bare root, 1-1	1513	Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only.	Each	$0.12	2000	$240.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	2000	$180.00
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	10	$479.00

Practice: 381 - Silvopasture Establishment

Scenario #9 - Establish hardwood trees in an existing pasture with adequate forage

Scenario Description:

Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:

10-acre pasture has inadequate livestock shelter resulting in loafing and overuse and wear of pasture on partially shaded field boundary. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Livestock Production Limitation -Inadequate Livestock Shelter.

After Situation:

Appropriate tree species are selected and the spacing and layout arrangement is determined for optimum stem density. The existing pasture sod is suppressed by mechanical or chemical means to provide competition control to benefit tree seedling growth. Trees are planted and properly protected until they are established well enough to allow livestock grazing without significant stand loss. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,525.43

Scenario Cost/Unit: $452.54

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.	Acre	$6.17	0.8	$4.94
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	40	$494.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	0.8	$15.10
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	700	$224.00
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	700	$2,954.00
Stakes, wood, 3/4" x 3/4" x 48"	1582	3/4" x 3/4" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$1.19	700	$833.00

Practice: 381 - Silvopasture Establishment

Scenario #10 - Establish conifer trees in an existing pasture with adequate forage

Scenario Description:

Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:

10-acre pasture has inadequate livestock shelter resulting in loafing and overuse and wear of pasture on partially shaded field boundary. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Livestock Production Limitation -Inadequate Livestock Shelter.

After Situation:

Appropriate tree species are selected and the spacing and layout arrangement is determined for optimum stem density. The existing pasture sod is suppressed by mechanical or chemical means to provide competition control to benefit tree seedling growth. Trees are planted and properly protected until they are established well enough to allow livestock grazing without significant stand loss. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $725.03

Scenario Cost/Unit: $72.50

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.	Acre	$6.17	0.8	$4.94
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	30	$370.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	0.8	$15.10
Tree, conifer, seedling, bare root, 1-1	1513	Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only.	Each	$0.12	1100	$132.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	1100	$99.00

Practice: 382 - Fence

Scenario #1 - Exclusion, electric

Scenario Description:

A beef cattle operation where livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts buried in the ground. It has 4 strands of high tensile wire that are electrified. The fence has 4 corners and one gate is included to facilitate livestock movement.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas and/or other sensitive areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,333.84

Scenario Cost/Unit: $2.53

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.	Hour	$7.35	9.2	$67.62
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	4	$17.56
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	10	$249.10
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	38	$784.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	9.2	$193.20
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	$116.19	2	$232.38
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	52	$331.76
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.47	8	$91.76
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	13	$199.94
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.70	7	$74.90
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$1.84	7	$12.88
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.46	2	$20.92
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$30.53	1	$30.53
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	$9.82	1	$9.82
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$41.90	1	$41.90
Electric, Energizer, 3-4 joule	28	Electric, Energizer, 3-4 joule for electric fence. Includes materials and shipping only.	Each	$234.40	1	$234.40
Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	$0.13	1650	$214.50
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$212.40	1	$212.40

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	$171.75	1	$171.75

Practice: 382 - Fence

Scenario #2 - Exclusion, electric, mountain site

Scenario Description:

A beef cattle operation where livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts buried in the ground. It has 4 strands of high tensile wire that are electrified. The fence has 6 corners and one gate is included to facilitate livestock movement. A higher payment is justified for this scenario due to the additional corners, braces and posts required for mountainous site and corresponding increase in labor to install the fence.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas and/or other sensitive areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $4,144.78

Scenario Cost/Unit: $3.14

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.	Hour	$7.35	14.6	$107.31
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	4	$17.56
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	15	$373.65
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	10	$284.40
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.	Hour	$20.64	45	$928.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	14.6	$306.60
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	$116.19	2	$232.38
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	69	$440.22
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.47	12	$137.64
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	19	$292.22
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.70	7	$74.90
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$1.84	7	$12.88
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.46	2	$20.92
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$30.53	1	$30.53
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	$9.82	1	$9.82
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$41.90	1	$41.90
Electric, Energizer, 3-4 joule	28	Electric, Energizer, 3-4 joule for electric fence. Includes materials and shipping only.	Each	$234.40	1	$234.40
Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	$0.13	1650	$214.50
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$212.40	1	$212.40

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	$171.75	1	$171.75

Practice: 382 - Fence

Scenario #3 - Exclusion, barbed wire

Scenario Description:

A cow-calf pasture where livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts driven into the ground. It has 5 strands of galvanized barbed wire with lower strands spaced closer together than upper strands (spacing of 6", 6", 10", 10", 12"). One gate is included to facilitate livestock movement.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. A robust fence is needed to prevent livestock damaging fence, or escaping it in order to reach lush forage in the riparian zone. The soils are light-textured, loamy, so the soil has lower bearing strength against livestock pressing on the fence. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas and/or other sensitive areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,446.15

Scenario Cost/Unit: $2.61

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.	Hour	$7.35	8	$58.80
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	4	$17.56
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	8	$199.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	10	$284.40
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.	Hour	$20.64	38	$784.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$72.51	5	$362.55
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	88	$561.44
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.47	8	$91.76
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	13	$199.94
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.17	1320	$224.40
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$212.40	1	$212.40
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	$171.75	1	$171.75

USDA - Natural Resources Conservation Service

Tennessee

Practice: 382 - Fence

Scenario #4 - Interior

Scenario Description:

A constructed interior barrier for implementing prescribed grazing of livestock (usually cattle). Fence includes wood posts driven into the ground with three strands of high tensile wire and 1 gate built according to state FOTG standards. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Before Situation:

Grazing distribution is less then optimal. Plants are either over or underutilized causing degradation of organic matter or spot grazing.

After Situation:

Permanent fence is installed to divide pasture into paddocks. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $2,680.02

Scenario Cost/Unit: $2.03

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.	Hour	$7.35	8	$58.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	8	$199.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	30	$619.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
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	$116.19	1	$116.19
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	55	$350.90
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.47	3	$34.41
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	7	$107.66
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.70	5	$53.50
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$1.84	5	$9.20
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$30.53	1	$30.53
Electric, Energizer, 3-4 joule	28	Electric, Energizer, 3-4 joule for electric fence. Includes materials and shipping only.	Each	$234.40	1	$234.40
Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	$0.13	1320	$171.60
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$212.40	1	$212.40
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	$171.75	1	$171.75

Practice: 382 - Fence

Scenario #5 - Interior, mountain site

Scenario Description:

A constructed interior barrier for implementing prescribed grazing of livestock (usually cattle). Fence includes charger, wood posts driven into the ground with three strands of high tensile wire and 1 gate built according to state FOTG standards. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat. A higher cost is justified for this scenario due to the rough, undulating terrain and or additional corners braces and posts required for mountainous areas as determined by each state.

Before Situation:

Grazing distribution is less then optimal. Plants are either over or underutilized causing degradation of organic matter or spot grazing.

After Situation:

Permanent fence is installed to divide pasture into paddocks. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,159.87

Scenario Cost/Unit: $2.39

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.	Hour	$7.35	11.5	$84.53
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	11.5	$286.47
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	10	$284.40
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.	Hour	$20.64	33	$681.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	11.5	$241.50
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	$116.19	1	$116.19
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	69	$440.22
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.47	3	$34.41
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	7	$107.66
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.70	5	$53.50
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$1.84	5	$9.20
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$30.53	1	$30.53
Electric, Energizer, 3-4 joule	28	Electric, Energizer, 3-4 joule for electric fence. Includes materials and shipping only.	Each	$234.40	1	$234.40
Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	$0.13	1320	$171.60
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$212.40	1	$212.40
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	$171.75	1	$171.75

Practice: 382 - Fence

Scenario #6 - Woven wire

Scenario Description:

A 2.5 acre, small ruminant pasture where the livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts buried into the ground, 48" woven wire fabric, a barbed wire strand on bottom and top, and fasteners. The fence has 4 corners and one gate is included to facilitate livestock movement.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $4,227.85

Scenario Cost/Unit: $3.20

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.	Hour	$7.35	15	$110.25
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	4	$17.56
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	15	$373.65
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	5	$142.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	43	$887.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$72.51	2	$145.02
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	$261.88	4	$1,047.52
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	$8.21	88	$722.48
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.47	8	$91.76
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	13	$199.94
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$212.40	1	$212.40

Practice: 382 - Fence

Scenario #7 - Polywire, no charger

Scenario Description:

Installing a polywire fence with step in/fiberglass posts on 50' centers and all appurtenances to control movement of grazing animals in an managed grazing system such as stockpiling or strip grazing. Polywire power source provided by connection to perimeter electric fence.

Before Situation:

Forage use is inefficient and this effects plant condition negatively. 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:

The practice facilitates improved forage utilization. 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: Feet of fence installed

Scenario Unit:: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $310.38

Scenario Cost/Unit: $0.24

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.	Hour	$20.64	2	$41.28
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	2	$96.98
Post, Fiberglass, 11/16" X 6'	19	Fiberglass line post, 11/16" diameter X 6' length. Includes materials and shipping only.	Each	$6.62	26	$172.12

Practice: 382 - Fence

Scenario #8 - Polywire, with charger

Scenario Description:

Installing a polywire fence with step in/fiberglass posts on 50' centers, solar energizer, and all appurtenances to control movement of grazing animals in an managed grazing system such as stockpiling or strip grazing.

Before Situation:

Forage use is inefficient and this effects plant condition negatively. 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:

The practice facilitates improved forage utilization. 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: Feet of fence installed

Scenario Unit:: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $635.73

Scenario Cost/Unit: $0.49

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.	Hour	$20.64	2	$41.28
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	2	$96.98
Post, Fiberglass, 11/16" X 6'	19	Fiberglass line post, 11/16" diameter X 6' length. Includes materials and shipping only.	Each	$6.62	26	$172.12
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35

Practice: 382 - Fence

Scenario #9 - Confinement

Scenario Description:

A confinement fence is installed around a 60'x180', heavy use area to keep cattle confined away from pasture during non-grazing periods. This scenario is priced using a typical specification for 5 strand high tensile wire and wood posts buried in the ground at 6-foot spacing. One gate is included to facilitate livestock movement in and out of the confinement area. Resource conservation benefits of this practice scenario, used in combination with other supporting and facilitating practices (such as Heavy Use Area and Prescribed Grazing) include improving water quality and forage plant condition.

Before Situation:

Cattle feed and lounge in an area where their waste contaminates a stream. In addition, forage in the vicinity of lounging area is over-utilized, and poor quality due to the over grazing and soil compaction.

After Situation:

Cattle lounge and feed confined inside the heavy use area during non-grazing periods. Surface water contamination is reduced and forage condition recovers on the pasture.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 480.0

Scenario Total Cost: $2,683.38

Scenario Cost/Unit: $5.59

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 Yard	$113.81	2	$227.62
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	8	$58.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	8	$199.28
Fence, Wire Assembly, High Tensile Electric, 5 Strand	1087	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	$0.19	480	$91.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
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	$116.19	1	$116.19
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	86	$1,322.68
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$169.37	1	$169.37

Practice: 382 - Fence

Scenario #10 - 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. Fence is typically installed by a contactor and includes labor and materials.

Before Situation:

Where a NRCS designed and constructed waste storage pond is planned whereby significant risk to human safety is determined to be evident. Livestock has access to sensitive areas that may cause detrimental effect to animal/human health and wildlife habitat. Resource concerns affected are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment or water quality due to turbidity..

After Situation:

Humans and livestock are excluded from the waste storage pond for safety purposes by installing a fence around a waste holding pond. The fence would typically be 100 wide x 175 long with one gate and installed by a fencing contractor. Woven wire fence with one strand of barb wire on top with a gate. Improved livestock control and access to water or other sensitive areas will promote safety for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition.

Feature Measure: Length of Fence

Scenario Unit:: Foot

Scenario Typical Size: 450.0

Scenario Total Cost: $2,974.00

Scenario Cost/Unit: $6.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Fence, Chain Link	1079	Fence, Chain Link, 5' High, 9 ga Wire, Posts in Concrete on 10' Centers. Includes all materials, equipment and labor.	Foot	$14.87	200	$2,974.00

Practice: 384 - Woody Residue Treatment

Scenario #7 - Chipper/Shredder On-Off site

Scenario Description:

Treating an area of forest or undergrowth slash of undesirable species to reduce hazardous fuels and the risk of insect and disease, improve organic matter, avoid resprouting and reduce erosion while improving water quality. Removal of slash for undesirable species allows better effectiveness for undesirable species. Slash is treated with both hand (cutting, lopping, etc.) and mechanically (masticating, chipping, etc.) and/or piled in a desirable location. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential excessive plant pest pressure, plant productivity and invasive species control.

Before Situation:

Woody material resulting from a silvicultural practice such as pruning, removal or a light thinning operation is causing both fire hazard and pest issues.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Competition to desirable species is reduced and Invasive species are controlled allowing any required secondary treatments to be more effective.

Feature Measure: Acre Treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,085.91

Scenario Cost/Unit: $108.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	15	$65.85
Brush Chipper, 6" capacity	938	Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hour	$21.36	20	$427.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	20	$412.80
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	$70.51	1	$70.51

Practice: 386 - Field Border

Scenario #5 - Field Border, Native Species

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 organic seed for herbaceous species.

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 while creating a buffer between organic systems and conventional cropping systems. Native grasses and legumes will be established in 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. Species selected shall be adapted to the 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $123.52

Scenario Cost/Unit: $123.52

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.	Acre	$11.20	3	$33.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Untreated Conventional Seed, One Species, Warm Season, Native Perennial Grass	2341	Untreated conventional native, warm season perennial grass. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$68.44	1	$68.44

Practice: 386 - Field Border

Scenario #6 - Field Border, Introduced Species

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.

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 in 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. Species selected shall be 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $86.45

Scenario Cost/Unit: $86.45

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.	Acre	$11.20	1	$11.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
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	$0.42	30	$12.60
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	$0.48	20	$9.60
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	1	$31.57

Practice: 386 - Field Border

Scenario #7 - Field Border, Pollinator

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.

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 be 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,007.09

Scenario Cost/Unit: $1,007.09

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.	Acre	$11.20	3	$33.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Six Species Mix, Native Forb	2334	Native forb mix. Includes material and shipping only.	Acre	$952.01	1	$952.01

Practice: 386 - Field Border

Scenario #19 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $474.60

Scenario Cost/Unit: $474.60

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.	Acre	$11.20	3	$33.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.5	$197.78
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.5	$153.30
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	1	$68.44

Practice: 386 - Field Border

Scenario #20 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $437.53

Scenario Cost/Unit: $437.53

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.	Acre	$11.20	1	$11.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.5	$197.78
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.5	$153.30
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	$0.42	30	$12.60
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	$0.48	20	$9.60
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	1	$31.57

Practice: 386 - Field Border

Scenario #21 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,358.17

Scenario Cost/Unit: $1,358.17

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.	Acre	$11.20	3	$33.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.5	$197.78
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.5	$153.30
Materials						
Six Species Mix, Native Forb	2334	Native forb mix. Includes material and shipping only.	Acre	$952.01	1	$952.01

Practice: 390 - Riparian Herbaceous Cover

Scenario #1 - Warm Season Grass with Forbs

Scenario Description:

Warm Season Grasses with Forbs: 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 Range Planting (528), 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). This practice can be used nation wide. 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. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily warm season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

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 Cove

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $342.46

Scenario Cost/Unit: $342.46

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.	Acre	$6.17	2	$12.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	$91.25	1	$91.25
One Species, Native Forb, Low Cost	2329	Native forb. Includes material and shipping only.	Acre	$179.65	1	$179.65

Practice: 390 - Riparian Herbaceous Cover

Scenario #2 - Cool Season Grasses with Forbs

Scenario Description:

Cool Season Grasses with Forbs: 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 Range Planting (528), 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). This practice can be used nation wide. 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. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily cool season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

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 Cove

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $275.86

Scenario Cost/Unit: $275.86

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
Three Species Mix, Cool Season, Native Perennial Grass	2316	Cool season, native grass mix. Includes material and shipping only.	Acre	$139.51	1	$139.51
One Species, Native Forb, Low Cost	2329	Native forb. Includes material and shipping only.	Acre	$179.65	0.5	$89.83

Practice: 390 - Riparian Herbaceous Cover

Scenario #3 - Pollinator Habitat

Scenario Description:

Pollinator Habitat: This scenario addresses inadequate pollinator habitat consisting of a herbaceous plant community. It functions to provide 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 provide the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Upland Wildlife Habitat Management (645) , 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). This practice can be used nationwide. 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. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily native forbs and a warm season grass to provide forage for pollinators. Selected species will be tolerant to the site conditions planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

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). The existing conditions do not provide food for pollinators throughout the growing season. 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. Plants established provide pollinator food sources and nesting areas. The quality and quantity of the riparian zone components are managed to support the pollinators 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: wildlife habitat, 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 Cove

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $637.87

Scenario Cost/Unit: $637.87

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.	Acre	$6.17	2	$12.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	1	$566.31

Practice: 390 - Riparian Herbaceous Cover

Scenario #39 - Native Warm Season Grass

Scenario Description:

Warm Season Grasses: 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 Range Planting (528), 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). This practice can be used nation wide. 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. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of warm season grasses tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

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 and/or livestock resource concern(s). Conditions may require suppression or eradication of current invasive vegetation by conventional mechanical or chemical methods to ensure establishment success of the new planting after stands have been planted.

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 Cove

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $162.81

Scenario Cost/Unit: $162.81

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.	Acre	$6.17	2	$12.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	$91.25	1	$91.25

Practice: 390 - Riparian Herbaceous Cover

Scenario #40 - Introduced Cool Season Grasses

Scenario Description:

Cool Season Grasses: 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 Range Planting (528), 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). This practice can be used nation wide. 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. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of only cool season grasses tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

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 eradication of current vegetation by conventional mechanical or chemical methods. 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 Cover

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $116.28

Scenario Cost/Unit: $116.28

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.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
Three Species Mix, Cool Season, Native Perennial Grass	2316	Cool season, native grass mix. Includes material and shipping only.	Acre	$139.51	0.5	$69.76

Practice: 391 - Riparian Forest Buffer

Scenario #1 - Cuttings

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of tree and/or shrub poles and live stakes (whips) planted by hand. Materials will be from a nearby, off-site location. The ratio of whips to poles will be 5:1. The cuttings will be planted in a mosaic pattern while still dormant. Tree mesh will be placed on the large cuttings. Resource concerns to be addressed are 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.

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 above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $5,463.14

Scenario Cost/Unit: $2,731.57

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.	Hour	$63.09	10	$630.90
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$7.35	10	$73.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	10	$284.40
Tractor, agricultural, 30 HP	1501	Agricultural tractor with horsepower range of less than 50. Equipment and power unit costs. Labor not included.	Hour	$9.38	10	$93.80
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.	Hour	$15.99	10	$159.90
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	10	$123.60
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	$2.44	10	$24.40
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.	Hour	$20.64	70	$1,444.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	10	$210.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
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.	Hour	$106.41	4	$425.64
Materials						
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.48	250	$120.00
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$17.74	50	$887.00
Tree shelter, mesh tree tube, 48"	1556	48" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.11	50	$55.50

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	$171.75	1	$171.75
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 391 - Riparian Forest Buffer

Scenario #2 - Bare-root, hand planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of hand planted bare-root shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Resource concerns to be addressed are 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.

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 above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $2,555.40

Scenario Cost/Unit: $851.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
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.	Hour	$7.30	2	$14.60
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	16	$197.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	3	$1,186.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	1210	$677.60
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	194	$75.66
Tree, conifer, seedling, bare root, 1-1	1513	Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only.	Each	$0.12	242	$29.04

Practice: 391 - Riparian Forest Buffer

Scenario #3 - Bare-root, machine planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of machine planted bare-root shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Resource concerns to be addressed are 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.

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 above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $2,747.21

Scenario Cost/Unit: $915.74

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.	Hour	$24.91	6	$149.46
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	6	$42.06
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	3	$1,186.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	14	$288.96
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	6	$126.00
Materials						
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	1210	$677.60
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	194	$75.66
Tree, conifer, seedling, bare root, 1-1	1513	Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only.	Each	$0.12	242	$29.04
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	$171.75	1	$171.75

Practice: 391 - Riparian Forest Buffer

Scenario #4 - Small container, hand planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of hand planted small containerized shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Resource concerns to be addressed are 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.

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 above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $6,538.12

Scenario Cost/Unit: $2,179.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
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.	Hour	$7.30	2	$14.60
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	32	$395.52
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	3	$1,186.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Materials						
Shrub, seedling or transplant, potted, 1 qt.	1524	Potted shrub, 1 quart. Includes materials and shipping only.	Each	$2.49	1210	$3,012.90
Tree, hardwood, seedling or transplant, potted, 1 qt.	1529	Potted hardwood tree, 1 quart. Includes materials and shipping only.	Each	$2.44	194	$473.36
Tree, conifer, seedling or transplant, potted, 1 qt.	1534	Potted conifer tree, 1 quart. Includes materials and shipping only.	Each	$2.42	242	$585.64

Practice: 391 - Riparian Forest Buffer

Scenario #5 - Large container, hand planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of hand planted large containerized shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Trees and shrubs will be strategically placed at an average of 48 per acre (30' x 30' spacing if evenly distributed). Tree shelters will be placed on the hardwoods and evergreens. Resource concerns to be addressed are 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.

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 above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $6,811.77

Scenario Cost/Unit: $2,270.59

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.	Hour	$44.85	8	$358.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
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.	Hour	$7.30	2	$14.60
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.	Hour	$15.99	2	$31.98
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	80	$988.80
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	3	$1,186.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	80	$1,651.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Materials						
Shrub, seedling or transplant, potted or B&B, 2-3 gal.	1527	Potted or balled and burlapped shrub, 2-3 gal. Includes materials and shipping only.	Each	$8.89	48	$426.72
Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal.	1532	Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only.	Each	$7.08	48	$339.84
Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal.	1537	Potted or balled and burlapped conifer tree, 2-3 gal. Includes materials and shipping only.	Each	$6.90	48	$331.20
Tree shelter, solid tube type, 4" x 60"	1567	4" x 60" tree tube for protection from animal damage. Materials only.	Each	$5.22	96	$501.12
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	192	$9.60
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	96	$153.60
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 391 - Riparian Forest Buffer

Scenario #6 - Bare root shrubs, 300 stems per acre, no tubes

Scenario Description:

Establish a buffer of hardwood shrubs or trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 12' x 12'; (302 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of 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, 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 will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buffer

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,267.40

Scenario Cost/Unit: $633.70

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.	Hour	$12.36	3	$37.08
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	2	$791.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20
Materials						
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	600	$336.00

Practice: 391 - Riparian Forest Buffer

Scenario #7 - Shrub Planting, 680 stems per acre, no tubes

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of hand planted or machine planting bare-root shrubs. Generally, planting for shrubs will be done at 8' x 8' spacing however, other spacing may be used depending on the objective. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of 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, 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 above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buffer

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,825.00

Scenario Cost/Unit: $912.50

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.	Hour	$12.36	7	$86.52
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	2	$791.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	9	$185.76
Materials						
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	1360	$761.60

Practice: 391 - Riparian Forest Buffer

Scenario #8 - Shrub Planting, 871 stems per acre, no tubes

Scenario Description:

Establish a buffer of trees and/or 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 extending a minimum of 35 feet wide. The planting will consist of hand planted or machine planting bare-root shrubs. Generally, planting for shrubs will be done at 5' x 10' spacing however, other spacing may be used depending on the objective. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of 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, 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 above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buffer

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $2,071.92

Scenario Cost/Unit: $1,035.96

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.	Hour	$12.36	8	$98.88
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	2	$791.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Materials						
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	1742	$975.52

Practice: 391 - Riparian Forest Buffer

Scenario #9 - Bare Root Hardwoods with tubes, 110 trees per acre

Scenario Description:

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 20' x 20'; (110 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of 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, 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 will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buffer

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $9,202.16

Scenario Cost/Unit: $920.22

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.	Hour	$12.36	16	$197.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	10	$3,955.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
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.	Hour	$38.33	4	$153.32
Materials						
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	1100	$2,365.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	2200	$110.00
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	1100	$1,760.00

Practice: 391 - Riparian Forest Buffer

Scenario #10 - Bare Root Hardwoods with tubes, 150 trees per acre

Scenario Description:

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 15' x 20'; (150 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of 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, 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 will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buffer

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $11,651.28

Scenario Cost/Unit: $1,165.13

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.	Hour	$12.36	24	$296.64
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	10	$3,955.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	48	$990.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	1500	$480.00
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	1500	$3,225.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	1500	$2,400.00

Practice: 391 - Riparian Forest Buffer

Scenario #11 - Bare Root Hardwoods with tubes, 300 trees per acre

Scenario Description:

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 12 X 12 (300 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of 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, 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 will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buffer

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $18,386.96

Scenario Cost/Unit: $1,838.70

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.	Hour	$12.36	48	$593.28
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	10	$3,955.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	96	$1,981.44
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.	Hour	$38.33	8	$306.64
Materials						
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	3000	$6,450.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	6000	$300.00
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	3000	$4,800.00

Practice: 391 - Riparian Forest Buffer

Scenario #14 - Natural regeneration with some limited tree planting

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 extending a minimum of 35 feet wide. The planting will consist of hand planted deciduous tree whips at a tree spacing of 40' x 40' (25 trees per acre). The area will be sprayed twice to remove existing heavy fescue sod and planted to a companion planting (once under 490 to kill fescue and once under 391 at planting to kill remaining competition). This will allow for natural regeneration and existing vegetation available from adjacent seed tree sources as well as from soil seed bank to establish and fill in between the planted trees at a 40'x40' spacing. Resource concerns to be addressed are 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. Payment includes trees, equipment and labor to plant trees and a companion planting (foregone income for the land taken out of production to install the riparian buffer not allowed per PS Notice 16-11). Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control.

Before Situation:

Cropland and pasture in the geomorphic floodplain and adjacent to a perennial stream or watercourse. The field is used to produce row-crops such as corn, wheat and soybeans grown in rotation or pasture for grazing. 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: Acre of riparian forest buffer

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $538.17

Scenario Cost/Unit: $538.17

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.	Hour	$24.91	1	$24.91
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$117.59	1	$117.59
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Materials						
Tree, hardwood, seedling or transplant, bare root, 36-60"	1511	Bare root hardwood trees 3 to 5 foot tall. Includes materials and shipping only.	Each	$0.89	25	$22.25
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	25	$53.75
Stakes, wood, 3/4" x 3/4" x 48"	1582	3/4" x 3/4" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$1.19	25	$29.75
Native or Non-Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2502	Native or Non-Native Grass and Forb Mix, including specialized species. Includes material and shipping only.	Acre	$124.80	1	$124.80

Practice: 393 - Filter Strip

Scenario #5 - Filter Strip, Native species

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural 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 contribution area while protecting environmentally-sensitive areas.

Feature Measure: number of acres

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $166.18

Scenario Cost/Unit: $166.18

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.	Acre	$11.20	3	$33.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	1.5	$42.66
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	1	$68.44

Practice: 393 - Filter Strip

Scenario #6 - Filter Strip, Introduced species

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural 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.

Feature Measure: Number of acres

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $174.49

Scenario Cost/Unit: $174.49

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.	Acre	$11.20	3	$33.60
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	1.5	$42.66
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	$0.42	30	$12.60
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	$0.48	20	$9.60
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	1	$47.90

Practice: 393 - Filter Strip

Scenario #16 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $540.07

Scenario Cost/Unit: $540.07

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.	Acre	$11.20	3	$33.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	1.5	$42.66
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.5	$197.78
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.5	$153.30
Materials						
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	$91.25	1	$91.25

Practice: 393 - Filter Strip

Scenario #17 - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $525.57

Scenario Cost/Unit: $525.57

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.	Acre	$11.20	3	$33.60
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	1.5	$42.66
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.5	$197.78
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.5	$153.30
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	$0.42	30	$12.60
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	$0.48	20	$9.60
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	1	$47.90

Practice: 394 - Firebreak

Scenario #1 - FireBreak-Disked

Scenario Description:

Installation of a bare-ground firebreak of a minimum width of 20' around a 20 acre field/farm using farm equipment. 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. This practice is typically implemented to control fire during a prescribed burn of a field with shrubs and/or warm season grasses managed for wildlife. 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:

Associated Practices: 338-Prescribed Burning; 383-Fuelbreak; 643- Restoration and Management of Declining Habitats; 645-Upland Habitat Development and Management; 647-Early Successional Habitat

Feature Measure: Length of firebreak

Scenario Unit:: Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $458.65

Scenario Cost/Unit: $0.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	6.8	$76.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	3	$61.92
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
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	$171.75	1	$171.75

Practice: 394 - Firebreak

Scenario #2 - Constructed - Medium equipment, flat-medium slopes (< 15% slopes)

Scenario Description:

Use of medium equipment such as small dozers to blade, disk, plow, etc. bare-soil firebreaks on slopes less than 15%. Generally, water control devices such as water bars are limited to 10 or less per 1,000 feet when properly planned and installed using the same equipment. Resource concerns include Wildfire hazards 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. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is negligible.

Feature Measure: Length of firebreak

Scenario Unit:: Foot

Scenario Typical Size: 3,000.0

Scenario Total Cost: $1,430.00

Scenario Cost/Unit: $0.48

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.	Hour	$66.50	4	$266.00
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.	Foot	$2.49	325	$809.25
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 394 - Firebreak

Scenario #3 - Constructed - Medium equipment, steep slopes (>= 15% slopes)

Scenario Description:

Use of equipment such as small dozers to blade bare-soil firebreaks on slopes equal to or greater than 15%. Water control devices such as water bars placed at approximately 15 to 25 per 1,000 ft section of firebreak, are necessary to control erosion. These will be installed with the same equipment. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, Habitat degradation, 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. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Length of firebreak

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,367.75

Scenario Cost/Unit: $1.37

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.	Hour	$66.50	4	$266.00
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.	Foot	$2.49	300	$747.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 394 - Firebreak

Scenario #4 - Vegetated 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 with the use of a bush hog or similar equipment. 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:

Firebreak installed in the fall prior to scheduled spring prescribed burn to control fire. Green firebreak established by planting clover and winter wheat. Soil amendments applied at seeding.

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:: Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $614.65

Scenario Cost/Unit: $0.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2	$104.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	2	$12.34
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	2	$13.30
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	2	$21.38
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
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.	Hour	$20.64	4	$82.56
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	$0.48	120	$57.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	120	$43.20
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	2	$65.52
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	2	$63.14
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	$70.51	1	$70.51

Practice: 394 - Firebreak

Scenario #6 - FireBreak-Dozer-Fire Plow

Scenario Description:

Practice is installed to facilitate a prescribed burn which will help maintain or enhance habitat (cover, shelter and forage) as well as connecting fragmented habitats. This practice scenario will be implemented to enhance plant condition by improving productivity, health and vigor of desired tree species. Habitat quality will also be improved as a result of reducing the stocking density of plants in the understory by and enabling regeneration of ground level vegetation

Before Situation:

A stand of forestland age 12-40+ with prescribed burning planned. Some border or property line firebreaks exist but additional firebreaks are needed to facilitate planned

After Situation:

After Practice Implementation: Firebreaks are installed by a contractor using a bulldozer/Fireplow and push blade to clear flammable debris and vegetation along the planned location. Raking and hand work is used to tie bladed firebreaks into streams, wetlands and other sensitive areas. Planned firebreaks are installed according design bladed width. Associated Practices: 338-Prescribed Burning; 383-Fuelbreak; 643- Restoration and Management of Declining Habitats; 645-Upland Habitat Development and Management; 647-Early Successional Habitat

Feature Measure: Length of feet

Scenario Unit:: Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $1,378.39

Scenario Cost/Unit: $0.28

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.	Hour	$195.23	4	$780.92
Fire Plow	1306	Heavy wildland plow or disk used for installing firebreaks. Equipment costs only for plow, use with a dozer component. Labor not included.	Hour	$50.36	4	$201.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

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 root wads 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: Bankfull width x reach length

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $20,784.37

Scenario Cost/Unit: $20,784.37

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.	Hour	$165.37	16	$2,645.92
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	8	$778.08
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	20	$593.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	30	$901.50
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$41.44	1	$41.44
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$17.74	300	$5,322.00
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	40	$1,398.00
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.51	50	$25.50
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	15	$378.15
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$231.59	30	$6,947.70
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$9.08	20	$181.60
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	$487.54	2	$975.08

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 biologist 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: Bankfull width x reach length

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $14,196.42

Scenario Cost/Unit: $14,196.42

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.	Hour	$165.37	16	$2,645.92
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	8	$778.08
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.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	30	$889.50
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	120	$3,606.00
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$17.74	100	$1,774.00
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	60	$2,097.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	20	$504.20
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	$487.54	2	$975.08

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 scenario 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: stream length X bankfull width

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $33,696.30

Scenario Cost/Unit: $33,696.30

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.	Hour	$165.37	16	$2,645.92
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	8	$778.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	60	$1,613.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	24	$495.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	180	$6,899.40
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.	Hour	$106.41	32	$3,405.12
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	17	$504.05
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	60	$1,803.00
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$41.44	1	$41.44

Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$17.74	300	$5,322.00
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	40	$1,398.00
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.51	8	$4.08
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	7	$176.47
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$231.59	30	$6,947.70
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$9.08	10	$90.80
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	$487.54	2	$975.08

Practice: 396 - Aquatic Organism Passage

Scenario #1 - Concrete Dam Removal

Scenario Description:

Full or partial removal of a concrete dam 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. A hydraulic analysis of the up and downstream impacts including potential loss of flood protection, irrigation, recreation, etc. must be completed and approved with the associated state and or federal requirements, environmental impact statement. Even though the structure is on private property state and federal regulations must be followed and signed off by a PE. Pre-removal sediment assays are completed to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done 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. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including canals, raceways, adjacent spillways, navigation locks, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: 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. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

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.

After Situation:

The existing dam is removed and reach geometry and slope 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: Cubic Yards of concrete in dam and

Scenario Unit:: Cubic Yard

Scenario Typical Size: 250.0

Scenario Total Cost: $115,608.26

Scenario Cost/Unit: $462.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$276.59	1.5	$414.89
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	320	$52,918.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	160	$7,176.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Foot	$148.67	50	$7,433.50
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	40	$4,892.80
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	$0.33	6100	$2,013.00
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.	Hour	$26.89	160	$4,302.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	160	$3,302.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	520	$12,922.00

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	80	$3,066.40
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$34.33	450	$15,448.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	3	$1,462.62

Practice: 396 - Aquatic Organism Passage

Scenario #3 - Blockage Removal

Scenario Description:

Removal of passage barriers, including small relict earthen diversions (e.g., splash dams), failing or undersized culverts, and sediment or large woody material (>10cm diameter and 2m length) from mass wasting or major flood events. Instream material associated with the previously mentioned circumstances or structures prevents aquatic organism passage by the creation of channel-spanning blockages, or areas of shallow depth, high velocities, or extensive changes in water surface elevation. In addition, these features may encourage abrupt channel changes that endanger adjacent capital infrastructure or transportation corridors. Excessive streambank erosion by flows deflected around or impounded behind these features may impair water quality by introducing fine sediment out of phase with the natural hydrograph and the life history requirements of native aquatic species. A hydraulic analysis of the up and downstream impacts including potential loss of flood protection, irrigation, recreation, etc. must be completed and approved with the associated state and or federal requirements, environmental impact statement. Even though the structure is on private property state and federal regulations must be followed and signed off by a PE. Removal is done with an assortment of equipment, including tracked excavators outfitted with buckets with "thumbs", bull dozers, skid steers, front-end loaders, and dump trucks. The channel and adjacent floodplain are restored to pre-blockage conditions to the fullest extent practicable. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the blockage can be used in site reclamation. Large woody material, if present, is used for instream reclamation, replaced in the channel downstream of the blockage, or trucked offsite for disposal or stockpiling for future projects. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed in the active channel and floodplain. RESOURCE CONCERNS: 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 Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (643) Restoration and Management of Rare and Declining Habitats. ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An instream feature spanning the active channel creates hydraulic conditions that exceed the swimming or crawling abilities of native aquatic organisms. Event-driven mass wasting or instream deposits of coarse sediment create channel blockages or areas of shallow, fast-moving water. An instream plug of material transported to the site by flood flows or delivered to the channel from a hillslope failure not only blocks passage, but may deflect the stream toward a new course than endangers adjacent capital infrastructure or transportation corridors. Elevated risks associated with eventual over-topping or failure of the blockage to downstream features or communities are imminent in the event of a blockage that forms a temporary dam. Accelerated instream or lateral channel erosion may introduce fine sediment that impairs water quality.

After Situation:

The instream barrier is removed by a combination of methods and equipment and the channel and affected floodplain are restored to pre-blockage conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of mineral sediment, fil

Scenario Unit:: Cubic Yard

Scenario Typical Size: 200.0

Scenario Total Cost: $22,342.74

Scenario Cost/Unit: $111.71

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.	Hour	$56.37	40	$2,254.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	40	$6,614.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	40	$1,794.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Foot	$148.67	10	$1,486.70
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	20	$2,446.40
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	$0.33	2000	$660.00
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.	Hour	$26.89	40	$1,075.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	140	$3,479.00

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	40	$1,533.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 396 - Aquatic Organism Passage

Scenario #5 - CMP Culvert

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, 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. The first estimate of culvert size--diameter or span--is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert diameter or span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the CMP diameter or span is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wing walls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and corrugations are determined by road loading requirements. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. . Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a sub excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Backfill depths are typically at least 20% of the culvert diameter or rise, but may deviate based on the shape of the culvert used, channel dimensions, substrate size, and the site longitudinal profile. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: 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 Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are 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.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream 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 promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: CMP

Scenario Unit:: Foot

Scenario Typical Size: 40.0

Scenario Total Cost: $29,894.79

Scenario Cost/Unit: $747.37

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	$2.30	100	$230.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	40	$6,614.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	40	$1,794.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Foot	$148.67	25	$3,716.75
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	40	$4,892.80
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.	Hour	$26.89	40	$1,075.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	120	$2,982.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	40	$1,533.20
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	75	$1,890.75
Pipe, CMP, 96", 14 Gauge	1835	96" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	$89.91	40	$3,596.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 396 - Aquatic Organism Passage

Scenario #8 - Concrete Box Culvert

Scenario Description:

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, concrete box culverts 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. The first estimate of culvert width is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert width is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert width is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wing walls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: 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. Use (578) Stream Crossing when the primary intent is not a biological concern, but hydrologic or for moving animals, vehicles or humans across or fording stream. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are 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.

After Situation:

The undersized culvert is replaced with a concrete box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream 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 promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: Length of Concrete box culvert

Scenario Unit:: Foot

Scenario Typical Size: 20.0

Scenario Total Cost: $38,455.08

Scenario Cost/Unit: $1,922.75

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	$2.30	100	$230.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	60	$9,922.20
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	40	$1,794.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Foot	$148.67	25	$3,716.75
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	40	$4,892.80
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.	Hour	$26.89	40	$1,075.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	60	$1,238.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	140	$3,479.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	40	$1,533.20
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	45	$1,134.45
Geocell, 6''	1842	6-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	$21.93	45	$986.85
Culvert, box, 6' x 8'	2175	Precast concrete box culvert, 6'X8'. Typically in 4' sections. Materials only.	Foot	$361.07	20	$7,221.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	2	$975.08

Practice: 396 - Aquatic Organism Passage

Scenario #12 - Concrete Ladder

Scenario Description:

Formed, reinforced, poured-in-place concrete structures outfitted with baffles (Denil), vertical slots, pools and weirs, submerged orifices, chutes or some combination thereof to provide upstream passage for aquatic organisms over dams and other hydraulic structures. Although fish ladder designs vary according to target species and site conditions, they can generally be described as a three-sided concrete channel with integrated hydraulic features that provide a gradual elevation increase across some distance that allows aquatic organism to swim over a barrier--they convert the total barrier head elevation into passable increments. Concrete ladders are often constructed with resting pools and may have switchbacks. The primary water source for a concrete ladder comes from streamflow diverted into the ladder exit (upstream end) and since it is passed through the ladder to the river below, it is not a consumptive use. These ladders often require flow control and regulating devices (sometimes automated), gates, and may need auxiliary pumps to provide attraction flows at the ladder entrance (downstream end) or augment flow in the ladder. Gages above and below the dam are required to inform ladder operation. Trash racks are used at the upstream end to block debris from entering the ladder. Concrete ladders also require frequent maintenance, and flow through unautomated ladders may need to be adjusted manually when adjacent river conditions or dam operations change. Concrete ladder designs can be complex and require interactions between engineering and ecological sciences for successful implementation. For example, the ladder entrance is one of the most important elements of the structure, and placement of this entrance in the downstream reach is a function of site characteristics and aquatic organism biology. In addition, some aquatic animals will not swim through a submerged orifice, so use of pool-orifice ladders is not recommended. Partners associated with dam ownership and operation, regulatory agencies, and others are consulted and included in the design and construction process. Ladder designs account for run volume and timing, and the swimming capabilities of target species. Some ladders in highly visible areas are finished with masonry facades to blend the ladder to the site in the interest of aesthetics or to conform with historic appearances. Concrete ladders are constructed with equipment for excavation, placing material, and delivering and removing material. Lifts or booms are required to place concrete into forms. Because ladders are often attached to existing dams, personnel familiar with the dam structure are involved at all phases of the process to ensure that plans conform with site requirements. Bed and bank excavation are necessary to create the location for concrete ladders, so site isolation and sediment and erosion control measures are used. Disturbed areas are revegetated using Critical Area Planting (342) and access control and signage are provided. Scenario does not include additional measures in the adjacent active channel necessary to control flow, address channel elevation or stability, or encourage fish guidance into the concrete ladder. Scenario does not include structures used as counting stations or to trap and sample upstream migrants. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An operational, low hazard class fixed crest concrete dam becomes the target of parties interested in providing fish passage. The dam presently blocks the upstream migration of a number of native aquatic organisms, and suitable spawning and rearing habitats for targeted fish species exists in upstream river reaches. Assessment of site conditions, dam operation, and target species swimming abilities indicate that a concrete ladder will provide suitable passage conditions during the migration season and pass the expected run volume without excessive delays.

After Situation:

A concrete pool and chute ladder outfitted with aluminum internal features and 2 turn/resting pool is installed. The ladder is attached to the face and abutment of the dam, and the entrance is located along the streambank where migrating aquatic organisms are likely to encounter it. The ladder passes the estimated run volume with minimal delays, and native aquatic animals are able to reach upstream spawning and rearing areas and successfully produce offspring that become part of the population. The ladder has an operating plan that stipulates actions and responsible parties for every month of the year. The ladder is fenced to control access and signage indicating its function and relevant warnings is provided at numerous locations. Resource Concerns are addressed within the context of the site.

Feature Measure: Barrier height (feet)

Scenario Unit:: Foot

Scenario Typical Size: 20.0

Scenario Total Cost: $250,404.77

Scenario Cost/Unit: $12,520.24

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 Yard	$359.17	500	$179,585.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$276.59	3	$829.77
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	60	$3,382.20
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.	Hour	$165.37	80	$13,229.60
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	80	$3,588.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Foot	$148.67	6	$892.02

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.	Hour	$79.21	60	$4,752.60
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	60	$5,835.60
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.	Hour	$26.89	80	$2,151.20
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.	Hour	$20.64	60	$1,238.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	280	$6,958.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	80	$3,066.40
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.	Hour	$106.41	220	$23,410.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	2	$975.08

Practice: 396 - Aquatic Organism Passage

Scenario #15 - Low Water Crossing

Scenario Description:

Structure installed on low volume or on unimproved roads at watercourse crossings. Primary use is to allow livestock and equipment access to other parcels of land or operational units. Low-water crossings provide safe and stable stream crossings that don't negatively impact water and ecological quality while remaining stable across a wide range of flows. Variations exist, but a common application consists of an improved or hardened ford located above a hydraulic control (e.g., bedrock outcropping, riffle, or step composed of coarse substrates). Properly designed and installed low water crossings provide aquatic organism passage (AOP), promote stream ecological and geomorphic function, remain stable over time, and can pass sediment and woody debris. Conservation planning and interaction with the landowner is vital to determine if existing crossings can be consolidated into fewer, more reliable locations. Characterizing a site according to its watershed position and geomorphic function will aid design decisions. Optimal AOP conditions are usually realized when the backfill is composed of a mixture that mimics bed material as evaluated from a reference reach adjacent to the crossing—preferably at least 10-20 estimated bankfull channel widths above an existing crossing to avoid effects that alter channel geometry or bedform composition and spacing. Low water crossings are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Low water crossings provide the best mix of function and longevity when they are designed and built to conform to existing channel geometry and slope, constructed to match the shape of the existing channel, and oriented to cross the stream at a 90 degree angle. Crossing width, measured along the downstream axis, should not exceed 2X bankfull width. Low water crossings are commonly constructed by over excavating the crossing section 6-12 inches below the existing streambed and backfilling the void with well-graded rock back to natural bed elevation. Geotextile lining may be required in some settings. Rock size and gradation is the smallest mix needed to remain stable under prevailing flow conditions—larger rock can endanger livestock and turbulence impairs passage. Sand or soil may be added into the mix to seal the section to ensure that the stream doesn't percolate into the crossing substrate. Smaller material increases bed diversity, chokes voids between bigger stones, and helps preserve passage quality. Smaller rock smaller (< 2 inches) at the finished surface may become lodged in livestock hooves. The road/trail surface of the crossing should be extended to an elevation that exceeds the known high water level on each side of the crossing. The downstream edge of the crossing should not produce a sharp drop in water surface to preserve AOP quality and discourage sediment deposition and debris accumulation. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Stream corridor fencing should be considered to control livestock access and preserve water and riparian quality. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A small farming operation has a mixture of pastures, hay meadows, and crops that all require seasonal movement of equipment and livestock between parcels. Four unimproved stream crossings provide unreliable access across the property and require yearly maintenance to clear debris and sediment. Farm equipment has gotten stuck in the past, and uncontrolled livestock access and frequent crossing or loafing in the stream contributes to chronic water quality problems associated with elevated fine sediment, high water temperatures, invasive aquatic vegetation, and fecal coliform bacteria. Livestock avoid three of the crossings when streamflow increases moderately. Two of the crossings are overwide and shallow, and impair AOP. The property and landowner's yearly operations are reviewed by conservation planners and—with the input and agreement of the landowner—it is decided that three of the four crossings can be eliminated and consolidated at one site above a cobble/boulder deposit in the stream.

After Situation:

An improved ford is constructed by excavating the channel just upstream of the boulder/cobble hydraulic control. The cut is lined with geotextile to control seepage and subsurface flow, and backfilled up to the existing bed elevation with a well-graded mix of rock sized to mimic the material in the channel upstream of the crossing. The finished crossing surface is at grade with the up and downstream channel elevation, and no drop exists along the downstream edge. Approaches on either side of the crossing are extended up to the adjacent floodplain surface, and the finished instream portion of the ford matches the existing channel cross section. Approach slopes are shallow enough for expected equipment traffic, including towed combinations, and armored as needed with larger rock to protect against erosion that may occur when the floodplain is inundated. The crossing is fenced and gated to control livestock access and provide greater flexibility to the landowner's grazing needs. AOP is provided, and the crossing remains stable across a range of flow and sediment and debris transport events. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yard of Crossing Material

Scenario Unit:: Cubic Yard

Scenario Typical Size: 42.0

Scenario Total Cost: $10,295.65

Scenario Cost/Unit: $245.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$276.59	0.5	$138.30
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	85	$195.50
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	24	$121.68
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	16	$2,645.92
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	16	$717.60
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	16	$1,957.12

Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	16	$430.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	48	$1,192.80
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.	Hour	$38.33	16	$613.28
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	48	$1,210.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 396 - Aquatic Organism Passage

Scenario #16 - Step Pool Weir

Scenario Description:

Step pool weirs are constructed features that provide passage around an instream barrier or in place of a removed barrier. Step Pool Weirs are constructed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Disturbed areas are revegetated using Critical Area Planting (342) and access control and signage are provided. Scenario does not include additional measures needed in the active channel and floodplain or at an existing dam necessary to control flow associated with nature-like fishway. RESOURCE CONCERNS: 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; EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Associated Practices (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment, 580 Streambank and Shoreline Protection, (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control580 Streambank and Shoreline Protection. Use (578) Stream Crossing when the primary intent is not a biological concern, but hydrologic or for moving animals, vehicles or humans across or fording stream.

Before Situation:

An instream barrier prevents upstream migration of native aquatic organisms and no support exists for removal. Similarly, an instream barrier is removed, and interested parties require maintenance of an upstream pool or pond.

After Situation:

A step pool weir is constructed in place of a removed barrier. The step pool weir is constructed of rock that provides quality passage conditions for a number of species and geomorphic stability over a range of flows. Resource Concerns are addressed within the context of the site. The typical scenario is for a 35' wide channel 100 feet long with weirs every 10'.

Feature Measure: Cubic Yard of Material

Scenario Unit:: Cubic Yard

Scenario Typical Size: 800.0

Scenario Total Cost: $89,421.59

Scenario Cost/Unit: $111.78

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	$2.30	390	$897.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	80	$13,229.60
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	80	$3,588.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Foot	$148.67	10	$1,486.70
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	40	$4,892.80
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.	Hour	$26.89	22	$591.58
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	200	$4,970.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	10	$383.30
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.	Hour	$106.41	80	$8,512.80
Materials						
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	1200	$41,940.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	292	$7,361.32
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 410 - Grade Stabilization Structure

Scenario #1 - Check Dams

Scenario Description:

Typical setting is on a 40-acre pasture/hayland field having a slope of 5 to 10 percent where ephemeral gullies have formed. Typical installation consists of stabilizing/regrading the gully and installing six check dams with a top width of 3', average height of 2.5', 19' length, and 2:1 side slopes, ; containing an average of 21 tons of rock for a total of 126 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The operator presently has erosion 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 vegetation of disturbed areas use Critical Area Planting (342).

Feature Measure: Tons of rock installed

Scenario Unit:: Ton

Scenario Typical Size: 126.0

Scenario Total Cost: $7,225.18

Scenario Cost/Unit: $57.34

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 Yard	$1.59	160	$254.40
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.	Hour	$20.64	8	$165.12
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	84	$6,294.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 410 - Grade Stabilization Structure

Scenario #2 - Embankment, Pipe <= 6 inches

Scenario Description:

An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. 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 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas 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), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit:: Cubic Yard

Scenario Typical Size: 2,000.0

Scenario Total Cost: $10,238.05

Scenario Cost/Unit: $5.12

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 Yard	$3.84	2000	$7,680.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	20	$101.40
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.	Hour	$114.38	5	$571.90
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	20	$537.80
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.	Hour	$20.64	10	$206.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	5	$124.25
Materials						
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	80	$505.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 410 - Grade Stabilization Structure

Scenario #3 - Embankment, Pipe 8-12 inches

Scenario Description:

An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. 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 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas 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), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit:: Cubic Yard

Scenario Typical Size: 2,500.0

Scenario Total Cost: $14,974.19

Scenario Cost/Unit: $5.99

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 Yard	$3.84	2500	$9,600.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	29	$147.03
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	10	$1,143.80
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.	Hour	$26.89	30	$806.70
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.	Hour	$20.64	30	$619.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	3	$88.95
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	60	$82.80
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	$18.40	90	$1,656.00
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

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Tennessee

Practice: 410 - Grade Stabilization Structure

Scenario #4 - Embankment, Pipe >12 inches

Scenario Description:

An earthen embankment dam with a principle spillway pipe greater than 12 inches. 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 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas 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), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit:: Cubic Yard

Scenario Typical Size: 2,500.0

Scenario Total Cost: $18,910.62

Scenario Cost/Unit: $7.56

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 Yard	$113.81	1	$113.81
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	2	$718.34
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	2500	$9,600.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	129	$654.03
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	13	$1,486.94
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	38	$1,021.82
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	42	$866.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	13	$323.05
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	14	$1,049.16
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$0.92	30	$27.60
Steel, Plate, 1/8"	1047	Flat Steel Plate, 1/8" thick, materials only.	Square Foot	$3.92	82	$321.44
Pipe, Steel, 12", Std Wt, USED	1356	Materials: - USED - 12" - Steel Std Wt	Foot	$21.63	90	$1,946.70
Pipe, Steel, 16", Std Wt, USED	1357	Materials: - USED - 16" - Steel Std Wt	Foot	$28.52	7	$199.64
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	$70.51	1	$70.51

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 410 - Grade Stabilization Structure

Scenario #5 - Embankment, Soil Treatment

Scenario Description:

An earthen embankment dam with a principal spillway pipe where on site soils are not acceptable and require extra processing or hauling from off farm, distances greater than one mile. 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 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas 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), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit:: Cubic Yard

Scenario Typical Size: 2,500.0

Scenario Total Cost: $23,224.19

Scenario Cost/Unit: $9.29

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 Yard	$3.84	2500	$9,600.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	29	$147.03
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	10	$1,143.80
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	$0.33	25000	$8,250.00
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.	Hour	$26.89	30	$806.70
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.	Hour	$20.64	30	$619.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	3	$88.95
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	60	$82.80
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	$18.40	90	$1,656.00
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

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Practice: 410 - Grade Stabilization Structure

Scenario #6 - Pipe Drop, Plastic

Scenario Description:

A full flow pipe drop (i.e.: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. 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 6 ft high 18" (1.5') PVC riser with a 40 ft long barrel (1.5' x 3.14 x 40' = 188 SF). Disturbed areas 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 Foot

Scenario Typical Size: 188.0

Scenario Total Cost: $4,691.29

Scenario Cost/Unit: $24.95

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 Yard	$359.17	1	$359.17
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	100	$384.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	20	$101.40
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.	Hour	$114.38	2	$228.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Pipe, PVC, 18", SCH 40	1373	Materials: - 18" - PVC - SCH 40 - ASTM D1785	Foot	$30.82	40	$1,232.80
Coupling, PVC, Tee, 24x18, SCH 40	1374	Materials: - Tee, 24"x18" - PVC - SCH 40 - ASTM D1785	Each	$1,672.52	1	$1,672.52
Pipe, PVC, 24", ASTM-2241, SDR 26	1945	Materials: -24" -PVC - ASTM 2241, SDR 26	Foot	$28.66	6	$171.96
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 410 - Grade Stabilization Structure

Scenario #7 - Pipe Drop, Steel

Scenario Description:

A full flow pipe drop (i.e.: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. 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 pipe drop structure with a 36", 12' tall riser and a 100' long 30" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 30ft = 940). Disturbed areas 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 Foot

Scenario Typical Size: 940.0

Scenario Total Cost: $13,503.36

Scenario Cost/Unit: $14.37

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 Yard	$3.84	600	$2,304.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	100	$507.00
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.	Hour	$114.38	4	$457.52
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.	Hour	$26.89	11	$295.79
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Steel, Plate, 1/8"	1047	Flat Steel Plate, 1/8" thick, materials only.	Square Foot	$3.92	30	$117.60
Pipe, Steel, 30", Std Wt, USED	1361	Materials: - USED - 30" - Steel Std Wt	Foot	$76.61	100	$7,661.00
Pipe, Steel, 36", Std Wt, USED	1362	Materials: - USED - 36" - Steel Std Wt	Foot	$97.81	12	$1,173.72
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$11.08	9	$99.72
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 410 - Grade Stabilization Structure

Scenario #8 - Weir Drop Structures

Scenario Description:

A Straight, semicircular, or Box 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 (i.e.: outlet apron elevation).Disturbed areas 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 Foot

Scenario Typical Size: 90.0

Scenario Total Cost: $7,783.52

Scenario Cost/Unit: $86.48

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 Yard	$359.17	9	$3,232.53
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	9	$20.70
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	40	$81.20
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	75	$288.00
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.	Hour	$114.38	5	$571.90
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	10	$268.90
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	30	$619.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	5	$124.25
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	3	$90.15
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$34.33	11	$377.63
Corrugated Steel, 12 Gauge, galvanized	1376	Corrugated Steel, 12 gauge, 3" by 1" corrugations, galvanized, meets ASTM A 929. Materials only.	Square Foot	$7.46	212	$1,581.52
Pipe, CMP, 12", 14 Gauge	1377	12" - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only.	Foot	$8.42	2	$16.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 410 - Grade Stabilization Structure

Scenario #9 - Rock Drop Structures

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are 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 gabion wall structure with a drop of 3ft and weir length of 8ft (24 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 (i.e.: outlet apron elevation).Disturbed areas 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 Foot

Scenario Typical Size: 24.0

Scenario Total Cost: $3,285.44

Scenario Cost/Unit: $136.89

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	$2.30	23	$52.90
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 Yard	$2.03	7	$14.21
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	40	$153.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	5	$571.90
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	$107.68	3	$323.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	5	$124.25
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	10	$383.30
Materials						
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 Yard	$135.02	7	$945.14
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service

Tennessee

Practice: 410 - Grade Stabilization Structure

Scenario #10 - Panel Rock Drop Structures

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire "cattle" panels. These structures are 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 structure with a drop of 4ft and weir length of 8ft (32 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 (i.e.: outlet apron elevation).Disturbed areas 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 Foot

Scenario Typical Size: 32.0

Scenario Total Cost: $2,343.65

Scenario Cost/Unit: $73.24

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 Yard	$2.03	17	$34.51
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	40	$153.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	3	$343.14
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.	Hour	$20.64	5	$103.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	3	$74.55
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	5	$191.65
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	$3.44	123	$423.12
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$34.33	25	$858.25
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	27	$119.07
Cattle Panel	1409	Welded wire cattle panel typically 1/4" galvanized steel rods, 50" high x 16' long. Materials only.	Each	$21.28	2	$42.56

Practice: 410 - Grade Stabilization Structure

Scenario #12 - Chute Structure

Scenario Description:

A chute structure consisting of rock riprap, pavers, concrete or any other durable material 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 10' wide chute that has 2:1 side slopes and is 1' deep and consists of rock that is 20" thick, stone that is 6" thick, and geotextile. The chute drops 6' vertical on a 2:1 slope with a 3' flat inlet and a 6' flat outlet, therefore, the typical surface area of the project is 14.4' x 22' or 323 SqFt. The unit of payment measurement is defined as the Tons of Rock Riprap used to build the rock structure, including the chute, side slopes, entrance and exit sections. Disturbed areas 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: Ton of Riprap

Scenario Unit:: Ton

Scenario Typical Size: 33.0

Scenario Total Cost: $1,823.98

Scenario Cost/Unit: $55.27

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 Yard	$2.03	10	$20.30
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	10	$50.70
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	2	$228.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$34.33	33	$1,132.89
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	36	$45.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 410 - Grade Stabilization Structure

Scenario #13 - Pipe Inlet

Scenario Description:

A pipe inlet installed consisting of plastic or CMP that does not require any additional appurtenances such as headwalls or risers. The pipe inlet may be of any size, typically 12" and less than 18" and may require a face plate, which is included as a part of the structure. Payment rate is based on 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 swales that outlet into field borders or filter strips. Cost estimate is based upon 30 foot long, 12" PVC pipe with a faceplate. Disturbed areas 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: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 30.0

Scenario Total Cost: $1,255.75

Scenario Cost/Unit: $41.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	5	$25.35
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	30	$35.70
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.	Hour	$20.64	4	$82.56
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	5	$374.70
Steel, Plate, 3/16"	1048	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	$5.89	1	$5.89
Pipe, PVC, 12", SDR 35	1252	Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only.	Foot	$18.66	30	$559.80
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	$171.75	1	$171.75

Practice: 412 - Grassed Waterway

Scenario #1 - GWW < 1000ft long

Scenario Description:

Typical practice is 500' long, 12' bottom, 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. 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. 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, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 500' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according 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: Square Foot of Waterway

Scenario Unit:: Square Foot

Scenario Typical Size: 18,000.0

Scenario Total Cost: $988.28

Scenario Cost/Unit: $0.05

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.	Acre	$6.65	0.4	$2.66
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	0.4	$4.28
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.4	$5.07
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$1.59	334	$531.06
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.	Hour	$20.64	1	$20.64
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.	Hour	$38.33	3	$114.99
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	$0.57	20	$11.40
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	$0.48	20	$9.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	20	$7.20
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.21	$6.88
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	0.4	$19.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 412 - Grassed Waterway

Scenario #2 - GWW > 1,000ft long

Scenario Description:

Typical practice is 1,500' long, 12' bottom, 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. 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. 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, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1,500 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,228.69

Scenario Cost/Unit: $2,228.69

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.	Acre	$6.65	1.25	$8.31
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	1.25	$13.36
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1.25	$15.84
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$1.59	1000	$1,590.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20
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.	Hour	$38.33	1	$38.33
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	$0.57	50	$28.50
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	$0.48	60	$28.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	60	$21.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	2	$65.52
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	1.25	$59.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 412 - Grassed Waterway

Scenario #3 - GWW with geotextile or stone checks

Scenario Description:

Typical practice is 1,200 ' long, 12' bottom, 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. Fabric or 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. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). 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, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1,200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,685.10

Scenario Cost/Unit: $2,685.10

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 Yard	$2.03	33	$66.99
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	33	$167.31
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	1	$10.69
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$1.59	800	$1,272.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	12	$247.68
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.	Hour	$38.33	2	$76.66
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	$0.57	40	$22.80
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	$0.48	50	$24.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	50	$18.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1.5	$49.14
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	132	$165.00
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	1	$47.90
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	1	$70.51
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 422 - Hedgerow Planting

Scenario #1 - Wildlife, NWSGs and trees, hand plant trees, machine plant grass

Scenario Description:

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native warm season grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. This scenario assumes approximate average width of 25 feet but may vary throughout. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

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 available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Square foot of planting

Scenario Unit:: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $641.98

Scenario Cost/Unit: $0.03

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.	Acre	$16.70	0.25	$4.18
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	0.25	$5.37
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	25	$516.00
Materials						
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	100	$39.00
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	100	$53.00
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	$29.31	0.25	$7.33
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	0.25	$17.11

Practice: 422 - Hedgerow Planting

Scenario #2 - Wildlife machine plant

Scenario Description:

This scenario is for machine planting of woody species. Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. This scenario assumes approximate average width of 25 feet but may vary throughout. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

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 available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Square foot of planting

Scenario Unit:: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $912.66

Scenario Cost/Unit: $0.05

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.	Acre	$16.70	0.33	$5.51
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	0.33	$7.09
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	2.5	$17.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	25	$516.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
Materials						
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	100	$39.00
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	100	$53.00
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	$29.31	0.33	$9.67
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	$91.25	0.33	$30.11
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	$171.75	1	$171.75

Practice: 422 - Hedgerow Planting

Scenario #3 - Wildlife cool season grass and trees, hand plant tree, machine plant grass

Scenario Description:

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A native cool season grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. This scenario assumes approximate average width of 35 feet but may vary throughout. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

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 available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Planting Area

Scenario Unit:: Square Foot

Scenario Typical Size: 28,000.0

Scenario Total Cost: $663.78

Scenario Cost/Unit: $0.02

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.	Acre	$16.70	0.25	$4.18
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	0.25	$5.37
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	25	$516.00
Materials						
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	100	$39.00
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	100	$53.00
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	$29.31	0.25	$7.33
One Species, Cool Season, Native Perennial Grass	2312	Native, cool season perennial grass. Includes material and shipping only.	Acre	$155.64	0.25	$38.91

Practice: 430 - Irrigation Pipeline

Scenario #1 - Buried Pipe Less Than or Equal to 2 Inch Diameter

Scenario Description:

Description: Below ground installation of main, submain, etc. PVC or PE pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch; Scenario- Install 1000 feet of 1.5-inch, Sch 40 PVC ASTM 1785 (0.52 #/ft) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). 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. 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.

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.

Feature Measure: Pipe Length

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,726.02

Scenario Cost/Unit: $2.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	7	$35.49
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	1000	$1,190.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.53	598	$914.94
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 430 - Irrigation Pipeline

Scenario #2 - Buried Pipe Greater Than 2 Inch Diameter and Less Than 6 Inch Diameter

Scenario Description:

Description: Below ground installation of main, submain, etc. PVC or PE pipeline.. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch; Scenario: Install 1000 feet of 4-inch, Sch 40 PVC (2 #/ft) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). 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. 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.

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.

Feature Measure: Pipe Length

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,330.08

Scenario Cost/Unit: $5.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	7	$35.49
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	1000	$1,190.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.53	2300	$3,519.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 430 - Irrigation Pipeline

Scenario #3 - Buried Pipe Greater Than or Equal to 6 Inch Diameter

Scenario Description:

Description: Below ground installation of main, submain, etc. PVC or PE pipeline.. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch. Scenario Install 1000 feet of 6-inch, Sch 40 PVC (3.6 #/ft) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). 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. 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.

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.

Feature Measure: Pipe Length

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $8,145.28

Scenario Cost/Unit: $8.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	7	$35.49
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	1000	$1,190.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.53	4140	$6,334.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 430 - Irrigation Pipeline

Scenario #4 - Surface HDPE

Scenario Description:

Description: Surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. Typical size of pipe installed: 1-inch to 4-inch; Install 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.43 lb/ft Appurtenances include: couplings, fittings, anchors, tees, air vents, thrust blocks, gate valves, air release valves, drain valve, and pressure relief valve, etc. and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe Cost of appurtenances does not include flow meters or backflow preventers. HDPE Pipeline with appurtenances, on the ground surface, next to fence line. Typical installation applies to soils with no special requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient 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.

Before Situation:

Pipeline leaking, too small for efficiency, needs replacement or supplement irrigation conveyance system.

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.

Feature Measure: Pipe Length

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,316.73

Scenario Cost/Unit: $1.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	$24.41	4	$97.64
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.	Hour	$20.64	12	$247.68
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	495	$900.90
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	1	$70.51

Practice: 436 - Irrigation Reservoir

Scenario #7 - Plastic Tank 2,000 - 4,000 gallons

Scenario Description:

A 3,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. 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.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit:: Gallon

Scenario Typical Size: 3,000.0

Scenario Total Cost: $3,823.99

Scenario Cost/Unit: $1.27

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.	Hour	$44.85	4	$179.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	4	$107.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	3000	$2,910.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	2	$41.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 436 - Irrigation Reservoir

Scenario #16 - Plastic Tank < 2000 gallons

Scenario Description:

A 1,200Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. 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.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram, or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit:: Gallon

Scenario Typical Size: 1,200.0

Scenario Total Cost: $2,069.83

Scenario Cost/Unit: $1.72

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.	Hour	$44.85	4	$179.40
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.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	1200	$1,164.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	2	$41.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 436 - Irrigation Reservoir

Scenario #17 - Plastic Tank > 4,000 gallons

Scenario Description:

A 7,000Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. 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.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram, or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit:: Gallon

Scenario Typical Size: 7,000.0

Scenario Total Cost: $7,703.99

Scenario Cost/Unit: $1.10

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.	Hour	$44.85	4	$179.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	4	$107.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	7000	$6,790.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	2	$41.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 441 - Irrigation System, Microirrigation

Scenario #1 - SDI (Subsurface Drip Irrigation)

Scenario Description:

A subsurface drip irrigation system (SDI) with a lateral spacing between 37-59 inches. This buried drip irrigation system utilizes a thinwall dripper line or tape with inline emitters at a uniform spacing for the system laterals. The dripper line or tape is normally installed by being plowed in approx. 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system includes an automated filter station, flow meter, backflow prevention device, automated control box or timer, the thinwall dipper line or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This is an all-inclusive system starting with the filter station including all required system components out to the flush valves. The water supply line from the water source to the filter station is an irrigation pipeline (430) and is not included as part of this system 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, 433 - Irrigation Flow Measurement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality

After Situation:

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 60 acre cropland or hayland field. The system lateral (thinwall dripper line or tape) spacing would 40 inches. This highly efficient SDI (buried) irrigation system provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed these SDI systems are capable of very uniform water applications. Typical field size is 60 acres.

Feature Measure: Acres in System

Scenario Unit:: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $118,815.36

Scenario Cost/Unit: $1,980.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	6800	$8,092.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$1,508.81	1	$1,508.81
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.53	4800	$7,344.00
Micro Irrigation, Media Filter, 30" to 48" Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$5,347.77	3	$16,043.31
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$345.53	1	$345.53
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$1,357.55	1	$1,357.55
Micro Irrigation, buried drip tape	2521	Tape that is installed underground for sub-surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tape is a minimum of 10 mil thick thick and has emitters built in. Includes labor and installtion.	Foot	$0.10	824108	$82,410.80
Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer	2523	Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only.	Each	$1,458.01	1	$1,458.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 441 - Irrigation System, Microirrigation

Scenario #2 - Surface PE with emitters

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trellis or above ground) with emitters to provide irrigation for an orchard, vineyard, or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed on a 60 acre vineyard on the ground surface or trellis. The vineyard has a plant spacing of 8 feet x 9 feet. Laterals are spaced 9 feet apart. This system utilizes emitters at each tree or plant as the water application device. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, emitters, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). 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, 433 - Irrigation Flow Measurement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A vineyard 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 vineyard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit:: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $148,208.56

Scenario Cost/Unit: $2,470.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	6800	$8,092.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$1,508.81	1	$1,508.81
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.53	4800	$7,344.00
Micro Irrigation, Media Filter, 30" to 48" Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$5,347.77	3	$16,043.31
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$345.53	1	$345.53
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$1,357.55	1	$1,357.55
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Foot	$0.35	319440	$111,804.00
Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer	2523	Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only.	Each	$1,458.01	1	$1,458.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 441 - Irrigation System, Microirrigation

Scenario #3 - Microjet

Scenario Description:

A micro-irrigation system, utilizing micro-jets to provide irrigation and\or frost protection for an orchard or other specialty crops grown in a grid pattern. The system is installed with all fittings, control valves, pressure reducing/regulating valves, air/vacuum release, sand media/screen/disc filters, pressure gauges, submains, lateral lines, and micro-jet sprayers to deliver water to the trees. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). The typical installation is a permanent, microjet -irrigation system installed on a 60 acre orchard. Typical tree spacing is 20' x 20 feet. 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, 433 - Irrigation Flow Measurement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

An orchard has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A micro-spray microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit:: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $183,027.52

Scenario Cost/Unit: $3,050.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	6800	$8,092.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$1,508.81	1	$1,508.81
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.53	4800	$7,344.00
Micro Irrigation, Media Filter, 30" to 48" Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$5,347.77	3	$16,043.31
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$345.53	1	$345.53
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$1,357.55	1	$1,357.55
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.	Foot	$1.02	143748	$146,622.96
Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer	2523	Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only.	Each	$1,458.01	1	$1,458.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 441 - Irrigation System, Microirrigation

Scenario #4 - Surface Tape 1.1 - 6 acres

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. 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 issue as required for proper operation of the system. Water source is typically groundwater well or public water source. 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, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applications and significant water losses affecting both water quantity and water quality.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 3 acre irrigated field with lateral spacing of 2 feet.

Feature Measure: Acres in System

Scenario Unit:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $5,637.72

Scenario Cost/Unit: $1,879.24

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.	Hour	$20.64	4	$82.56
Materials						
Valve, Air Vacuum Release, Manual	1041	Materials for <2" Manual Air/Vacuum Relief Valve	Each	$33.33	1	$33.33
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	49	$89.18
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	$222.74	1	$222.74
Water Meter, Microirrigation, <= 2”, with Volume Totalizer	2437	Microirrigation water meter less than or equal to 2 inch diameter, with volume totalizer. Includes materials only.	Each	$293.51	1	$293.51
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2" diameter.	Each	$14.07	1	$14.07
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.	Foot	$0.07	65340	$4,573.80
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	$156.78	1	$156.78
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$171.75	1	$171.75

Practice: 441 - Irrigation System, Microirrigation

Scenario #5 - Surface Tape > 6 acres

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or other field crops. Spacing of drip tape similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. Does not include Pump, power source, water source. 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 a part of regular operation and maintenance as required for proper operation of the system. 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, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would include an existing inefficient sprinkler or surface irrigation system used to irrigate vegetables or other crops. The existing irrigation system would supply excessive or inadequate non-uniform irrigation applications with significant water losses affecting both water quantity and water quality.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Crop water requirements are met. Water applications are normally reduced and runoff eliminated. Offsite water quality is improved, and on site water use reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 15 acre irrigated field with lateral spacing of 2.5 feet.

Feature Measure: Acres in System

Scenario Unit:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $17,612.16

Scenario Cost/Unit: $1,174.14

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.	Hour	$20.64	8	$165.12
Materials						
Valve, Air Vacuum Release, Manual	1041	Materials for <2" Manual Air/Vacuum Relief Valve	Each	$33.33	1	$33.33
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	49	$89.18
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	$222.74	1	$222.74
Water Meter, Microirrigation, <= 2”, with Volume Totalizer	2437	Microirrigation water meter less than or equal to 2 inch diameter, with volume totalizer. Includes materials only.	Each	$293.51	1	$293.51
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2" diameter.	Each	$14.07	1	$14.07
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.	Foot	$0.07	235224	$16,465.68
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	$156.78	1	$156.78
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$171.75	1	$171.75

Practice: 441 - Irrigation System, Microirrigation

Scenario #6 - Hoop House Surface Microirrigation

Scenario Description:

Surface Microirrigation system for 30' x 96' seasonal high tunnel, 24" rows with emitters on a 12" spacing. 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, 433 - Irrigation Flow Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A field has an inefficient garden-hose based 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 area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Microirrigation area

Scenario Unit:: Square Foot

Scenario Typical Size: 2,880.0

Scenario Total Cost: $1,101.19

Scenario Cost/Unit: $0.38

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.	Hour	$20.64	4	$82.56
Materials						
Test, comprehensive specialized water test, well water	2002	Comprehensive testing for a broad spectrum of pesticides, inorganic chemicals or volatile organics not included in a basic well suitability test. Includes materials and shipping only.	Each	$222.74	1	$222.74
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 Foot	$0.12	2880	$345.60
Water Meter, Microirrigation, <= 2”, with Volume Totalizer	2437	Microirrigation water meter less than or equal to 2 inch diameter, with volume totalizer. Includes materials only.	Each	$293.51	1	$293.51
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	$156.78	1	$156.78

Practice: 441 - Irrigation System, Microirrigation

Scenario #17 - Surface Tape < or = 1 acre

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. 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 issue as required for proper operation of the system. Water source is typically groundwater well or public water source. 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, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applications and significant water losses affecting both water quantity and water quality.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1 acre irrigated field with lateral spacing of 3 feet.

Feature Measure: Acres in System

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,181.96

Scenario Cost/Unit: $2,181.96

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.	Hour	$20.64	4	$82.56
Materials						
Valve, Air Vacuum Release, Manual	1041	Materials for <2" Manual Air/Vacuum Relief Valve	Each	$33.33	1	$33.33
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	49	$89.18
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	$222.74	1	$222.74
Water Meter, Microirrigation, <= 2”, with Volume Totalizer	2437	Microirrigation water meter less than or equal to 2 inch diameter, with volume totalizer. Includes materials only.	Each	$293.51	1	$293.51
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2" diameter.	Each	$14.07	1	$14.07
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.	Foot	$0.07	15972	$1,118.04
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	$156.78	1	$156.78
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$171.75	1	$171.75

Practice: 442 - Sprinkler System

Scenario #5 - Traveling Gun System, < 2 inch 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 3 acres. The irrigation system is installed with all necessary appurtenances. 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)

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 The irrigation system is installed with all necessary appurtenances.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12,257.34

Scenario Cost/Unit: $12,257.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System with <= 2" Nominal size hose, and appurtenances light duty	1478	Irrigation, Traveling Gun System with <= 2" 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	$12,257.34	1	$12,257.34

Practice: 442 - Sprinkler System

Scenario #6 - Traveling Gun System, 2 to 3 inch 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. 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)

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.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $24,037.02

Scenario Cost/Unit: $24,037.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System, > 2" to 3 " Nominal size hose	1479	Irrigation, Traveling Gun System with 2.3 to 3 " 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	$8,012.34	3	$24,037.02

Practice: 442 - Sprinkler System

Scenario #7 - Traveling Gun System, > 3 inch 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. 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)

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.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $47,558.92

Scenario Cost/Unit: $47,558.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System, > 3" Nominal size hose	1762	Irrigation, Traveling Gun System with > 3" Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 1300'	Each	$47,558.92	1	$47,558.92

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. 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)

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.

Feature Measure: Number of Sprinkler Pods

Scenario Unit:: Each

Scenario Typical Size: 14.0

Scenario Total Cost: $3,697.44

Scenario Cost/Unit: $264.10

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	$254.03	14	$3,556.42
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	$70.51	2	$141.02

Practice: 442 - Sprinkler System

Scenario #9 - Renovation of Existing Sprinkler System

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. A typical scenario assumes a 1300 LF span, including end booms renozzled with low-pressure nozzles. 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)

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.

Feature Measure: Length of Lateral Retrofitted

Scenario Unit:: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $10,989.83

Scenario Cost/Unit: $8.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hour	$42.42	8	$339.36
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.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
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.	Foot	$7.74	1300	$10,062.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario #1 - Surge Valve & Controller

Scenario Description:

This scenario would typically include installation and utilization of a 10-inch surge valve with automated controller (including all appurtenances) and installation labor needed to convert from a conventional surface irrigated system to a surge irrigation system. Typical field size is 80 acres. The surge valve will be used with PVC Gated Pipe or PE Gated Tubing to convey and distribute irrigation water to alternating irrigation sets in a timed surge cycle that results in reduced a surging irrigation application. The surging action increases rate of advance along set length, reduces deep percolation at upper end of field, increases uniformity of application along row length, and on lower intake soils can significantly reduce runoff losses. The result is improved irrigation efficiency, reduced leaching and erosion losses, and conserved energy. This scenario does not include gated pipe or associated practices. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Unacceptable irrigation application uniformity along existing surface irrigation system furrow or border length caused by excessive run length or soil infiltration rate when operated with continuous inflow on existing system. System is over irrigated in attempt to adequately irrigate low end of field.

After Situation:

A surge surface irrigation system is in place. After implementation, distribution uniformity and irrigation efficiency is improved, by reducing irrigation application volume and deep percolation losses. Runoff reductions, reduced energy use, and air quality improvements can also result.

Feature Measure: Number of Surge Valves

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,277.59

Scenario Cost/Unit: $2,277.59

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.	Hour	$20.64	2	$41.28
Materials						
Surge Valve And Controller	1477	Surge Valve and Controller, with appurtenances. Material cost includes valve, controller, all appurtenances, and mobilization.	Each	$2,236.31	1	$2,236.31

Practice: 449 - Irrigation Water Management

Scenario #1 - Basic IWM <= 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

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 15 ac. corn field (average between 1 ac. and 30 ac.) 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.

Feature Measure: Area of Irrig. Systems Managed

Scenario Unit:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $318.44

Scenario Cost/Unit: $21.23

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.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32

Practice: 449 - Irrigation Water Management

Scenario #2 - Basic IWM > 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

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 100 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.

Feature Measure: Area of Irrig. Systems Managed

Scenario Unit:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $483.56

Scenario Cost/Unit: $9.67

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.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	4	$153.32

Practice: 449 - Irrigation Water Management

Scenario #3 - Intermediate IWM <= 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. 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 Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

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 corn field with a surface irrigation system. The typical irrigated field is a 15 acre corn field(average between 1 ac. and 30 ac.) 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.

Feature Measure: Area of Irrig. Systems Managed

Scenario Unit:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $644.04

Scenario Cost/Unit: $42.94

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.	Hour	$20.64	9	$185.76
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.	Hour	$38.33	4	$153.32
Materials						
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$304.96	1	$304.96

Practice: 449 - Irrigation Water Management

Scenario #4 - Intermediate IWM > 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. 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 Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

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 100 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.

Feature Measure: Area of Irrig. Systems Managed

Scenario Unit:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $809.16

Scenario Cost/Unit: $16.18

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.	Hour	$20.64	17	$350.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$304.96	1	$304.96

Practice: 449 - Irrigation Water Management

Scenario #5 - Advanced- 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. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and read sensors or meter. 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. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

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 supplemented by weather station data providing improved irrigation water management and reduced energy use. Two monitoring stations are installed.

Feature Measure: Number of Measuring Sites

Scenario Unit:: Each

Scenario Typical Size: 2.0

Scenario Total Cost: $1,376.58

Scenario Cost/Unit: $688.29

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.	Hour	$20.64	7	$144.48
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.	Hour	$38.33	5	$191.65
Materials						
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$304.96	1	$304.96
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$292.95	1	$292.95
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$37.69	8	$301.52
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	$70.51	2	$141.02

Practice: 449 - Irrigation Water Management

Scenario #6 - Soil Moisture Sensors with Data Recorder

Scenario Description:

This practice includes the installation of one weather station, eight 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 two data loggers to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Typical Scenario involves installation of resistance sensor blocks in a 120 acre field of sprinkler irrigated cropland, two monitor stations are installed representing 60 acres of typical soil and crop. 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. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

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 management and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit:: Each

Scenario Typical Size: 2.0

Scenario Total Cost: $2,710.87

Scenario Cost/Unit: $1,355.44

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.	Hour	$26.89	4	$107.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20
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.	Hour	$38.33	5	$191.65
Materials						
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$304.96	1	$304.96
Data Logger	1453	Data Logger W/Graphic Output for water management. Materials only.	Each	$780.48	2	$1,560.96
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$37.69	8	$301.52
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	$70.51	2	$141.02

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 Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $3,537.46

Scenario Cost/Unit: $0.79

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 Yard	$2.03	90	$182.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$5.65	535	$3,022.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 468 - Lined Waterway or Outlet

Scenario #2 - Rock Lined, 12 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before 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:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit:: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $14,123.01

Scenario Cost/Unit: $3.14

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 Yard	$2.03	276	$560.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	176	$13,189.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 468 - Lined Waterway or Outlet

Scenario #3 - Rock Lined - 18 inches

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 12", Velocity ~ 9 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 12" Rock Riprap. 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:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit:: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $20,896.37

Scenario Cost/Unit: $4.64

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 Yard	$2.03	364	$738.92
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.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	264	$19,784.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 468 - Lined Waterway or Outlet

Scenario #4 - Rock Lined, 24 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before 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:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit:: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $27,592.76

Scenario Cost/Unit: $6.13

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 Yard	$2.03	451	$915.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	351	$26,303.94
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 468 - Lined Waterway or Outlet

Scenario #8 - Plunge Pool - Rock

Scenario Description:

Install a 2 ft thick rock lined plunge pool that is 15 ' long, 10ft btm width, 2:1ss and 5' deep lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of outlet erosion. Situation is to difficult to handle with vegetative stabilization.

After Situation:

Rock lined plunge pool is 15 ' long, 10ft btm width, 2:1ss and 5' deep. Plunge 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: Cubic Yard of Rock Placed

Scenario Unit:: Cubic Yard

Scenario Typical Size: 50.0

Scenario Total Cost: $4,813.81

Scenario Cost/Unit: $96.28

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 Yard	$2.03	86	$174.58
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.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	8	$306.64
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	50	$3,747.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 472 - Access Control

Scenario #1 - Trail and or road closure

Scenario Description:

Restricting access to the use of forest/farm roads and trails by the use of a gate and limited fencing. Resource concerns include Undesirable plant productivity and health, Concentrated flow erosion, Soil compaction, Excessive sediment in surface waters, and Wildlife habitat degradation.

Before Situation:

Roads are damaged or misused, illegal activities occur and/or forest resources are at risk. Extensive amount of fencing (other than that needed to restrict access at the site of ingress) is not included in this scenario, but instead will be planned and installed with the Fence practice (382).

After Situation:

Roads are protected, illegal activities are stopped and/or forest resources are secure.

Feature Measure: Number

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $578.45

Scenario Cost/Unit: $578.45

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.	Hour	$7.35	2	$14.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
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.	Hour	$20.64	4	$82.56
Materials						
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	4	$25.52
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	4	$61.52
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$169.37	1	$169.37
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$3.75	10	$37.50

Practice: 472 - Access Control

Scenario #2 - Animal exclusion from riparian zone

Scenario Description:

Livestock remain excluded by a fence from a riparian area that was previously grazed, in order to protect water quality. Monitoring occurs to ensure development of invasive plants or plants toxic to livestock is detected. In addition, monitoring occurs to ensure impacts of human access does not degrade natural resources. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be established using the associated practice 382 Fencing. The primary resource concern is water quality; secondary concern: wildlife habitat. Other associated practices include: 390 Riparian Herbaceous Buffer and 391 Riparian Forest Buffer;

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.

Feature Measure: Area of Riparian zone

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $54.50

Scenario Cost/Unit: $27.25

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	$16.93	2	$33.86
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.	Hour	$20.64	1	$20.64

Practice: 472 - Access Control

Scenario #3 - Animal exclusion from other sensitive areas such as wetlands and sinkholes

Scenario Description:

Livestock remain excluded by a fence from springs, seeps, wetlands, tidal marsh areas, sinkholes or other similarly sensitive ecological site that was previously grazed, in order to protect water quality. Monitoring occurs to ensure development of invasive plants or plants toxic to livestock is detected. In addition, monitoring occurs to ensure impacts of human access does not degrade natural resources. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be established using the associated practice 382 Fencing. The primary resource concern is water quality; secondary concern: wildlife habitat. Other associated practices include: 390 Riparian Herbaceous Buffer and 391 Riparian Forest Buffer;

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.

Feature Measure: Area with sensitive landscape

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $18.02

Scenario Cost/Unit: $18.02

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	$16.93	0.15	$2.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	0.75	$15.48

Practice: 472 - Access Control

Scenario #4 - Animal exclusion from woodland areas

Scenario Description:

Livestock remain excluded by a fence from woodlands sites that were previously grazed, in order to protect water quality. Monitoring occurs to ensure development of invasive plants or plants toxic to livestock is detected. In addition, monitoring occurs to ensure impacts of human access does not degrade natural resources. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be established using the associated practice 382 Fencing. The primary resource concern is water quality; secondary concern: wildlife habitat. Other associated practices include: 390 Riparian Herbaceous Buffer and 391 Riparian Forest Buffer;

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.

Feature Measure: Wooded area

Scenario Unit:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $46.04

Scenario Cost/Unit: $3.07

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	$16.93	1.5	$25.40
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.	Hour	$20.64	1	$20.64

Practice: 484 - Mulching

Scenario #1 - Natural Material - Full Coverage

Scenario Description:

Application of straw mulch or 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 125 bales/acre (3 bales/1000 sq ft)

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:

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $543.61

Scenario Cost/Unit: $543.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	0.5	$10.96
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.	Hour	$20.64	10	$206.40
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	2.5	$326.25

Practice: 484 - Mulching

Scenario #2 - Erosion Control Blanket

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, straw and is typically covered on both sides with polypropylene netting. Used to help control erosion and establish vegetative cover.

Before Situation:

There are areas of concentrated flow or very steep eroding areas needing a high level of erosion protection. Soil erosion is a concern and there is little to no vegetation.

After Situation:

The erosion control blanket is placed on concentrated flow or steep areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit:: Square Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $1,062.84

Scenario Cost/Unit: $0.21

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.	Hour	$20.64	16	$330.24
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	555	$732.60

Practice: 484 - Mulching

Scenario #3 - Synthetic Material

Scenario Description:

Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, moderate soil temperature, and provide erosion control. Payment based on actual area covered by mulching material.

Before Situation:

Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased.

Feature Measure: SF Covered by Mulch

Scenario Unit:: Square Foot

Scenario Typical Size: 43,560.0

Scenario Total Cost: $11,132.00

Scenario Cost/Unit: $0.26

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	$2.30	4840	$11,132.00

Practice: 484 - Mulching

Scenario #4 - Tree and Shrub

Scenario Description:

Barrier fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting to support establishment. Typically used during the installation of conservation practices. Rate is per tree/shrub and assumes 1 square yard of barrier fabric and 5 staples/tree.

Before Situation:

Site conditions vary. Typical scenario is an installation of 100 native trees and shrubs to enhance wildlife habitat. Sites are often remote and trees may not be planted in rows, requiring each tree to be mulched individually

After Situation:

Barrier fabric squares are installed with 5 sod staples each, around individual trees and shrubs to aid establishment. Weeds are controlled and soil moisture conserved to aid tree/shrub growth establishment.

Feature Measure: Number of Trees Mulched

Scenario Unit:: Each

Scenario Typical Size: 100.0

Scenario Total Cost: $230.00

Scenario Cost/Unit: $2.30

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	$2.30	100	$230.00

Practice: 484 - Mulching

Scenario #56 - Natural Material - Partial Coverage

Scenario Description:

Application of straw mulch or other state approved natural material (such as wood chips, compost, or hay) to reduce erosion, moderate soil temperature and suppress weeds. Typically used to provide partial coverage (either in-row or between rows) to suppress weeds. Payment based on total acres mulched, assuming 3-5 ft. swatch and 10-12 ft. row spacing.

Before Situation:

Site conditions vary. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Implementation Requirements are prepared according to the 484 Mulching Standard and implemented. 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 weed growth is suppressed.

Feature Measure: Total Acres Mulched

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $490.55

Scenario Cost/Unit: $49.06

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.	Hour	$24.91	5	$124.55
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	2	$261.00

Practice: 490 - Tree/Shrub Site Preparation

Scenario #1 - Ground Applied Herbicide, Forestland

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, 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.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $8,392.15

Scenario Cost/Unit: $209.80

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.	Acre	$6.17	40	$246.80
Materials						
Herbicide, Fosamine	333	Used as foliar spray applied in late summer or early fall for control and/or growth suppression of woody species. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$158.11	40	$6,324.40
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.	Acre	$37.83	40	$1,513.20
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.	Acre	$1.31	40	$52.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 490 - Tree/Shrub Site Preparation

Scenario #2 - Aerial Applied Herbicide, Forestland

Scenario Description:

This practice involves the use of herbicides applied by helicopter in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. This typical scenario includes open land such as abandoned fields, pastures or forestlands that were 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 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.

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 40 acres.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,950.04

Scenario Cost/Unit: $98.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, aerial application, turn-key operation	1994	Turn-key chemical application performed by helicopter on forest only. Includes all cost of chemical application including equipment, mobilization, labor and material.	Acre	$88.11	40	$3,524.40
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.	Hour	$106.41	4	$425.64

Practice: 490 - Tree/Shrub Site Preparation

Scenario #3 - Hand Applied Herbicide, Forestland

Scenario Description:

This practice involves the use of various herbicides applied using backpack sprayer or similar equipment, and hack-n-squirt for tree control, in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, previous forestlands that have been abandoned and are now covered with a mixture of grasses, forbs, shrubs and some remnant trees. Resource concerns are: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation, including woody and herbaceous plants, occupy 100 % of the site. 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 40 acres.

Feature Measure: area of treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $9,567.62

Scenario Cost/Unit: $239.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	10	$219.10
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	20	$1,305.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Fosamine	333	Used as foliar spray applied in late summer or early fall for control and/or growth suppression of woody species. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$158.11	40	$6,324.40
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.	Acre	$37.83	40	$1,513.20
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.	Acre	$1.31	40	$52.40

Practice: 490 - Tree/Shrub Site Preparation

Scenario #6 - Shear and Pile, Forest, Dozer

Scenario Description:

This practice involves the use of heavy machinery to treat an area in order to improve site conditions for establishing trees and/or shrubs. Typical sites include 1-5 year old cut-over forest land with trees and heavy brush cover 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 degradation - soil erosion - sheet and rill.

Before Situation:

The site is non stocked or inadequately stocked forestland to be reforested, dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush). 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 occurring in areas where the soil was severely disturbed exposing 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 heavy mechanical methods like shearing and piling to 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 40 acres.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $16,989.54

Scenario Cost/Unit: $424.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
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.	Acre	$221.17	40	$8,846.80
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.	Acre	$191.38	40	$7,655.20
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	$487.54	1	$487.54

Practice: 490 - Tree/Shrub Site Preparation

Scenario #7 - Mow and Spray, NonForest

Scenario Description:

This practice involves the use of a tractor pulling bush hog mower and band sprayed herbicide to clear above ground vegetation and target plants in order to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, and agricultural fields. 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, 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.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,594.74

Scenario Cost/Unit: $89.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	25	$1,305.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	24	$148.08
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.	Hour	$20.64	5	$103.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	25	$525.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
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.	Acre	$18.87	12	$226.44
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.	Acre	$37.83	12	$453.96
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.	Acre	$1.31	12	$15.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 490 - Tree/Shrub Site Preparation

Scenario #8 - Mow and Disk, NonForest

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, and over grown agricultural fields. 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 40 acres.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,480.46

Scenario Cost/Unit: $87.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	25	$1,305.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	40	$668.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	25	$525.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 490 - Tree/Shrub Site Preparation

Scenario #9 - Spray, Cross Rip ARRI

Scenario Description:

Spray site with glyphosate product in the summer then mechanically treat proposed planting areas with 4 foot single shank ripper using a D9 dozer or equivalent on an 8 foot by 8 foot cross section to reduce soil compaction on previously reclaimed mine lands to improve conditions for tree and/or shrub plantings. Cross ripping of sloped area is done on the contour to minimize erosion. This scenario reflects work being done through the Appalachian Regional Reforestation Initiative (ARRI) . http://arri.osmre.gov/fra/advisories/fra_no.4.pdf

Before Situation:

Open area has compacted soils and undesirable vegetation due mine reclamation land shaping techniques that will negatively affect the survival and growth of newly planted trees and/shrubs. This practice is used to reduce soil compaction and competing vegetation. Typical treatment area is 5 acres.

After Situation:

A previously mined site is sprayed with herbicide and cross ripped to alleviate compaction to allow the desired tree/shrub to be planted in the treated area. Resulting site is more conducive to tree/shrub growth because completion has been eliminated.

Feature Measure: Acreage treated

Scenario Unit:: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $3,053.25

Scenario Cost/Unit: $610.65

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.	Hour	$195.23	8	$1,561.84
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	5	$30.85
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.	Hour	$20.64	12	$247.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$106.41	4	$425.64
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.	Acre	$18.87	5	$94.35
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.	Acre	$1.31	5	$6.55
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	$487.54	1	$487.54

Practice: 500 - Obstruction Removal

Scenario #4 - 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 a 5.0 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 Yard

Scenario Typical Size: 500.0

Scenario Total Cost: $4,844.49

Scenario Cost/Unit: $9.69

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.	Hour	$63.09	21	$1,324.89
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	21	$2,042.46
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.	Hour	$20.64	21	$433.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	42	$1,043.70

Practice: 500 - Obstruction Removal

Scenario #5 - Removal and Disposal of Steel and or Concrete Structures

Scenario Description:

Remove and disposal of steel and or concrete structures by demolition, excavation or other means required for removal. Dispose of all steel and or concrete structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all steel and or concrete structures by removal to an approved location, or reuse location. Remove and dispose all steel and or concrete structures in order to apply conservation practices or facilitate the planned land use. Steel and or concrete structure 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 2000 square feet of impaired land. The removal of steel and or concrete structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all steel and or concrete structures 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 Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $29,065.66

Scenario Cost/Unit: $14.53

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.	Hour	$195.23	64	$12,494.72
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.	Hour	$63.09	64	$4,037.76
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	64	$7,828.48
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.	Hour	$26.89	65	$1,747.85
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	65	$1,341.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	65	$1,615.25

Practice: 500 - Obstruction Removal

Scenario #6 - Removal and Disposal of Wood Structures

Scenario Description:

Remove and disposal of wood structures by demolition, excavation or other means required for removal. Dispose of all wood structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all wood structures by removal to an approved location, landfill, or reuse location. Remove and dispose all wood structures in order to apply conservation practices or facilitate the planned land use. Wood structure 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 2000 square feet of impaired land. The removal of wood structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all wood structures 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 Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $14,569.02

Scenario Cost/Unit: $7.28

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.	Hour	$195.23	32	$6,247.36
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.	Hour	$63.09	32	$2,018.88
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hour	$122.32	32	$3,914.24
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.	Hour	$26.89	33	$887.37
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	33	$681.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	33	$820.05

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: Acreage of forage managed

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $76.95

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.	Hour	$26.89	1	$26.89
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.03	2	$50.06

Practice: 511 - Forage Harvest Management

Scenario #10 - Organic Preemptive Harvest

Scenario Description:

Preemptive harvest of forage crops to prevent damage from insects (such as leafhopper on alfalfa) or other pests results in better forage quality and better livestock performance.

Before Situation:

Forage pests are usually controlled with pesticides.

After Situation:

In organic or transitioning to organic systems, forage pests are controlled by executing a preemptive harvest before pests can damage forage quality. Forage yields are reduced because of immature stage of forage growth. Forage tests are submitted to an accredited lab for analysis. Records of forage quality components are used to adjust feeding rations.

Feature Measure: Relative Feed Value Maintained

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $141.95

Scenario Cost/Unit: $4.73

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	$65.00	1	$65.00
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.	Hour	$26.89	1	$26.89
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.03	2	$50.06

Practice: 511 - Forage Harvest Management

Scenario #11 - Double cropping Annuals- Delayed harvest and subsequent planting

Scenario Description:

In double cropped annual forages, delaying the harvest of the first crop will provide feed and shelter for ground nesting birds. Delaying the harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), 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 the young have fledged the second crop will be planted, approximately one month later than normal. Subsequently, the harvest of the second crop will cause an approximately 20% yield decline. The selected area should be large enough to buffer adults and nestlings from silage chopping in adjacent areas or fields. After young have fledged the field will be chopped and used as grain or silage. This practice is best planned cooperatively with the farmer and appropriate wildlife agencies far enough in advance to reduce disturbance to ground nesting birds. For example, Tricolored Blackbirds need a 35-day window from the time of nest building to fledge young and the silage needs to remain uncut until then.

Before Situation:

Double cropped annual forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation:

Double cropped annual crops are harvested with a delayed mowing and a subsequent later planting of the second crop; forage quality is compromised somewhat, however, the survival of ground nesting birds is promoted.

Feature Measure: Increased grassland bird populatio

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $141.95

Scenario Cost/Unit: $4.73

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	$65.00	1	$65.00
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.	Hour	$26.89	1	$26.89
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.03	2	$50.06

Practice: 511 - Forage Harvest Management

Scenario #12 - Hay Distribution

Scenario Description:

Changing management to meet livestock needs and protect natural resources. Livestock feeding on concentrated areas near water bodies during late fall, winter and early spring runoff is minimized. Use of grassland is improved, soil erosion is reduced, water quality is protected and livestock health is improved. This practice develops a feeding strategy that allows for animals to be moved between sites at a frequency that minimizes adverse impacts. Forages will be utilized by grazing livestock to the greatest extent possible while maintaining the condition of the pasture stand. As part of a planned winter grazing system, supplemental hay will need to be utilized. When hay is feed as a supplement for grazing forages, hay will be distributed in a manner to distribute livestock manures, reduce soil erosion, and minimize soil compaction. Increased level of management in hay distribution and rotation of livestock during winter months will promote recovery of spring forages due to improved nutrient distribution and reduce confinement of livestock during the winter months. Resource Concerns include: LIVESTOCK PRODUCTION LIMITATION: Inadequate feed and forage, WATER QUALITY: Excess nutrients in surface water INEFFICIENT ENERGY USE - Equipment and Facilities/Farming/Ranching Practices, SOIL CONDITION - Organic Matter Depletion, SOIL EROSION - Sheet and Rill

Before Situation:

Pasture and/or hayland - Traditionally pastures and hay meadows are not fully utilized and managed during the winter months and hay is fed close to the barn on an area that becomes overused and vegetative cover on feeding areas is destroyed. Hay fed in one area is wasted due to trampling. Livestock waste is confined to a small area. Excess nutrients build up in hay feeding areas.

After Situation:

Management system is changed to meet livestock needs and protect natural resources. Pastures and hay meadows are managed as part of an improved management system in which supplemental feed such as hay is fed where livestock nutrients are needed most. Distribution of hay feeding sites limits destruction of vegetative cover and improves soil quality. Management practices such as unrolling of hay, or distributing feeding areas evenly throughout the pasture/hayland area are commonly used. Hay bales may be staged in locations within the winter grazing area prior to the onset of harsh weather, and livestock may be moved to paddocks that include hay. Equipment use can be reduced. Spring cleanup time and effort is minimized. Hay waste is reduced as are winter hay needs. Water quality is improved because manure is evenly distributed throughout the pasture as livestock graze and nutrient loading at hay feeding sites, if needed, is reduced. Typical Scenario Size - 20 acres

Feature Measure: Area

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,099.50

Scenario Cost/Unit: $204.98

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.	Hour	$24.91	90	$2,241.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	90	$1,857.60

Practice: 511 - Forage Harvest Management

Scenario #13 - Delayed Mowing for Wildlife

Scenario Description:

Delaying the harvest of the first cutting in perennial forage crops will benefit ground nesting birds. Research at the University of Vermont showed that breeding success for declining grassland songbirds (e.g. Bobolink) went from 0 on a regularly harvested hay field to 2.8 fledglings per female per year when the first harvest on a hayfield was delayed until August 1st. Bobolinks, Eastern Meadowlarks, and Savannah Sparrows require a nesting period to fledge young that lasts through the end of July in most parts of the eastern US. The delayed harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), 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 hayfield size 20 acres. Resource Concern INADEQUATE HABITAT FOR FISH AND WILDLIFE – Quantity, quality or cover/shelter is inadequate to meet requirements of identified fish, wildlife or invertebrate species

Before Situation:

Perennial forage crops are produced and harvested throughout the nesting season; ground nesting birds are disturbed and/or fledgling birds are killed in the process. Typical hayfield size 20 acres

After Situation:

Perennial crops are harvested with a delayed mowing until after the nesting season; forage quality is compromised, however, the survival of ground nesting birds is promoted. Typical hayfield size 20 acres.

Feature Measure: Acre

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $572.90

Scenario Cost/Unit: $28.65

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	$65.00	1	$65.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	30	$507.90

Practice: 512 - Forage and Biomass Planting

Scenario #1 - Native warm season grass

Scenario Description:

Establish or reseed adapted perennial native grasses 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 native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $7,626.61

Scenario Cost/Unit: $254.22

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.	Acre	$6.17	30	$185.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	30	$199.50
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	30	$320.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$43.24	75	$3,243.00
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Herbicide, Imazapic	335	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$13.48	30	$404.40
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	30	$2,053.20

Practice: 512 - Forage and Biomass Planting

Scenario #3 - Native warm season grass mix

Scenario Description:

Establish or reseed adapted perennial native warm season grasses 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 perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $11,702.11

Scenario Cost/Unit: $390.07

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.	Acre	$11.20	30	$336.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	30	$185.10
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	30	$320.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$43.24	75	$3,243.00
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	30	$6,396.60

Practice: 512 - Forage and Biomass Planting

Scenario #4 - Native warm season grass mix, mined land

Scenario Description:

Establish or reseed adapted perennial native warm season grasses 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 perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Reclaimed mine land with low ph. Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $13,667.71

Scenario Cost/Unit: $455.59

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.	Acre	$11.20	30	$336.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	30	$185.10
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	30	$320.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$43.24	75	$3,243.00
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	60	$1,965.60
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	30	$6,396.60

Practice: 512 - Forage and Biomass Planting

Scenario #5 - Cool season grass and legume forage

Scenario Description:

Establish adapted perennial introduced cool season grasses and legumes 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 perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesirable 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $7,417.21

Scenario Cost/Unit: $247.24

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.	Acre	$11.20	30	$336.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	30	$185.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	30	$199.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
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	$0.57	1200	$684.00
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	$0.48	1500	$720.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	1500	$540.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	60	$1,965.60
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	30	$1,566.30

Practice: 512 - Forage and Biomass Planting

Scenario #6 - Warm season, introduced forage

Scenario Description:

Establish or reseed adapted introduced warm season grasses 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 perennial introduced warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $7,706.11

Scenario Cost/Unit: $256.87

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.	Acre	$11.20	30	$336.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	30	$185.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	30	$199.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
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	$0.57	1200	$684.00
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	$0.48	1500	$720.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	1500	$540.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	60	$1,965.60
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Introduced, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	$61.84	30	$1,855.20

Practice: 512 - Forage and Biomass Planting

Scenario #8 - Overseeding Legumes-No Fertilizer

Scenario Description:

Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture with no legumes present .

After Situation:

Legumes will be maintained through proper grazing management and improve plant diversity and soil quality.

Feature Measure: Acres of Forage and Biomass Planti

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $2,210.70

Scenario Cost/Unit: $73.69

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.	Acre	$21.48	30	$644.40
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	30	$1,566.30

Practice: 512 - Forage and Biomass Planting

Scenario #10 - Frost-Seeding Legumes-No Fertilizer

Scenario Description:

Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility and plant health and enhancing the quality of forage. Consider frost seeding legumes on soils with adequate soil pH (>6.0)and good fertility. Site preparation is achieved by grazing livestock. This scenario assumes seed, equipment and labor for seeding. This practice may be utilized for organic or regular production.

Before Situation:

Existing stand of perennial grasses or monoculture with no legumes present.

After Situation:

Legumes will be established and maintained through proper grazing management and will improve plant diversity and soil quality.

Feature Measure: Acres of Forage and Biomass Planti

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $635.86

Scenario Cost/Unit: $63.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	4	$113.76
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	10	$522.10

Practice: 512 - Forage and Biomass Planting

Scenario #11 - Annuals in conversion to desirable cool season grass-legume mix

Scenario Description:

Convert from a degraded toxic endophyte infected sod and establish a preferred, perennial cool season, grass- legume mix to improve forage quality or quantity to meet the nutritional needs and production goals of livestock, and promote soil health. The conversion will include a minimum, one-year double-crop, grazed annual mix, to smother the competition in combination with targeted burndown herbicide applications to kill the existing sod and escaped undesirable plants. Used for no-till seeding of annual and perennial grasses and legumes for pasture and hayland. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding and spreading. The practice is not complete until the perennial is established.

Before Situation:

Existing stand of degraded perennial grass legume mix or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable perennial cool season grass-legume species mix is established to improve forage quality and quantity and reduce soil erosion on pasture or hayland.

Feature Measure: Acres of Forage and Biomass Planti

Scenario Unit:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $10,170.01

Scenario Cost/Unit: $339.00

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.	Acre	$6.17	30	$185.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	30	$199.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
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	$0.48	1500	$720.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	1500	$540.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	60	$1,965.60
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	30	$1,566.30
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	30	$1,437.00
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$58.99	30	$1,769.70

Practice: 512 - Forage and Biomass Planting

Scenario #12 - Annuals in conversion to NWSG Mix

Scenario Description:

Convert from a degraded, mixed grass pasture to establish to a native warm season grass mix to improve forage quality or quantity, to improve or maintain livestock/wildlife nutrition and health, extend the length of forage production and grazing season in combination with grazing management, provide soil cover to reduce erosion and promote soil health. The conversion will include a minimum, one-year double-crop annual mix, to smother the competition, in combination with multiple targeted burndown herbicide applications to kill the existing sod and escaped plants between seasons. Used for no-till seeding of annual and perennial grasses and/or legumes for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding and spreading. This practice is not complete until the perennial is established.

Before Situation:

Existing stand of degraded perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable native warm season perennial plant mixture is 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:: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $12,886.81

Scenario Cost/Unit: $429.56

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.	Acre	$6.17	30	$185.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	30	$199.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	30	$982.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	30	$566.10
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	30	$1,566.30
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$58.99	30	$1,769.70
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	30	$6,396.60

Practice: 512 - Forage and Biomass Planting

Scenario #53 - Endophyte infect fescue conversion to native warm season grass mixture

Scenario Description:

Convert existing stand of endophyte-infected fescue stand to NWSGs to improve livestock nutrition and health and improve wildlife habitat values of the site. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings.

Before Situation:

Existing stand of endophyte-infected fescue grass provides poor nutrition to grazing livestock; poor wildlife habitat also. Resource concerns include undesirable forage quality and livestock health; may also include soil erosion and soil quality concerns.

After Situation:

Suitable NWSG species are established to improve forage quality, livestock nutrition and health as well as wildlife habitat. May also reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forage and Biomass Plant

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,173.20

Scenario Cost/Unit: $417.32

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.	Acre	$16.70	10	$167.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	20	$123.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	10	$214.80
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	10	$77.40
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$43.24	25	$1,081.00
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	20	$377.40
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: 512 - Forage and Biomass Planting

Scenario #54 - Chemical free fescue conversion to cool season grass and legume mixture

Scenario Description:

Organic farm situation most typical: an existing stand of fescue that will be smothered/suppressed using tillage and a summer annual mixture (multi-species, multi-functional group cover crop mix) followed by a winter annual mix. Tillage alone is not as successful as tillage plus smother crops and spraying is not permitted in organic operations. This cover serves to prepare for a desired end state when a cool season grass/legume mixture is established the following spring. This scenario assumes that all seed will be planted with a drill. The existing fescue sod will be setback initially using tillage followed by drilling summer annuals. The summer annuals should be allowed to generate as much biomass as possible, without delaying planting of the following ground cover. The summer annual species will be terminated or removed through mechanical means prior to planting the winter annual mix. The winter annuals will be terminated or removed using mechanical weed control/vegetation termination prior to planting the subsequent cool season grass and legume mixture. Establishment of cool season alternatives to fescue is for the purpose of increasing plant diversity, soil quality and fertility and plant health and enhancing the quality of forage. Initial site preparation (before tillage) may be achieved by grazing livestock. This scenario assumes seed, equipment and labor for seeding. This practice may be utilized for organic or non-organic production. This practice is not complete until the perennial is established.

Before Situation:

An existing stand of degraded fescue provides low biodiversity, poor soil health, poor wildlife habitat, poor quality and limited quantity forage and diminishing erosion control functions.

After Situation:

Field planted with two multispecies, multi-function annual mixes after primary tillage to set fescue back. The average field size is 10 acres. The annuals are seeded with a drill. No additional fertilizer is applied. The summer annuals provide soil erosion control cover by early summer; the winter annuals provide soil erosion control cover by late fall, throughout the winter, and into the early spring. The summer annuals are terminated using mechanical termination; the winter annuals are terminated with mechanical weed control/vegetation termination prior to spring planting of subsequent ground cover timed to maximize the smother effect on the original fescue stand.

Feature Measure: Acres of Forage and Biomass Planti

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,082.20

Scenario Cost/Unit: $308.22

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.	Acre	$11.20	10	$112.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	10	$167.00
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.65	20	$413.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	30	$644.40
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	20	$154.80
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	10	$522.10
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	10	$479.00
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$58.99	10	$589.90

Practice: 516 - Livestock Pipeline

Scenario #1 - Buried Pipeline, all diameters

Scenario Description:

Description: Buried installation of PVC or HDPE (Iron Pipe Size & Tubing) pipeline. Scenario is for 1000 feet of 1½-inch, Sch 40 PVC, ASTM D1785 (0.52#/ft) or (SIDR-PR) ASTM D2239 (PE 3408) HDPE pipe weighs 0.43 lb/ft. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 5% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pond (378), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,785.03

Scenario Cost/Unit: $2.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	1000	$1,190.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	12	$247.68
Materials						
Pipe, PVC, 1 ½", SCH 40	975	Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785	Foot	$1.04	1050	$1,092.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 516 - Livestock Pipeline

Scenario #2 - Surface Pipeline, all diameters

Scenario Description:

Description: Surface installation of PVC or HDPE (Iron Pipe Size & Tubing) pipeline. Scenario is for 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708) HDPE pipe weighing 0.43 lb/ft. Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Pond (378), Watering Facility (614), and Water Harvesting Catchment (636). 5% added to pipe length for appurtenances.

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,155.91

Scenario Cost/Unit: $1.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	$24.41	4	$97.64
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.	Hour	$20.64	8	$165.12
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	452	$822.64
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	$70.51	1	$70.51

Practice: 516 - Livestock Pipeline

Scenario #3 - Buried Pipeline in Rocky Terrain

Scenario Description:

Description: Buried installation of PVC or HDPE (Iron Pipe Size & Tubing) pipeline with 10% of line in rocky terrain. 1000 feet of 1½-inch, Sch 40 PVC, ASTM D1785 (0.52#/ft) or (SIDR-PR) ASTM D2239 (PE 3408) HDPE pipe weighs 0.43 lb/ft. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 5% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), Pond (378) and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,191.68

Scenario Cost/Unit: $5.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	900	$1,071.00
Trenching, Rock	1097	Includes equipment and labor for cutting trench in rock 6" x 36"	Foot	$24.96	100	$2,496.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	12	$247.68
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	1	$29.65
Pipe, PVC, 1 ½", SCH 40	975	Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785	Foot	$1.04	1050	$1,092.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 516 - Livestock Pipeline

Scenario #4 - Rural water connection in steep topography with a Reduced Pressure Zone device

Scenario Description:

The rural water connection includes 60' of pipe, a Reduced Pressure Zone device (RPZ), all valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. This item includes installation, all materials, appurtenances, and labor required to construct and install meter box. This item does not include the hook-up fees to the rural water system. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

Before Situation:

Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest in the northern plains region.

After Situation:

A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on pasture. The meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

Feature Measure: Rural water connection

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,740.54

Scenario Cost/Unit: $1,740.54

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.	Hour	$56.37	2	$112.74
Trencher, 8"	936	Equipment and power unit costs. Labor not included.	Hour	$90.34	2	$180.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Materials						
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	60	$82.80
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$461.35	1	$461.35
Valve, Double Check Backflow Preventer	2559	Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only.	Each	$143.15	1	$143.15
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 516 - Livestock Pipeline

Scenario #5 - Rural water connection without a Reduced Pressure Zone device

Scenario Description:

The rural water connection includes 60' of pipe, all valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. This item includes installation, all materials, appurtenances, and labor required to construct and install meter box. This item does not include the hook-up fees to the rural water system. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

Before Situation:

Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest in the northern plains region.

After Situation:

A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on pasture. The meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

Feature Measure: Rural water connection

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,279.19

Scenario Cost/Unit: $1,279.19

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.	Hour	$56.37	2	$112.74
Trencher, 8"	936	Equipment and power unit costs. Labor not included.	Hour	$90.34	2	$180.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Materials						
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	60	$82.80
Valve, Double Check Backflow Preventer	2559	Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only.	Each	$143.15	1	$143.15
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 516 - Livestock Pipeline

Scenario #6 - Freeze Proof Hydrant

Scenario Description:

Provide an adequate amount and quality of drinking water for livestock and address the associated resource concerns such as excessive nutrient buildup, grazing management, poor plant diversity and quality and soil/water quality. This scenario is for a pasture rotation or enhanced pasture management and utilization by installing freeze proof hydrants or quick connect couplers to support small portable water troughs (100 gallon) which provide a water supply. Because the system does not flow continuously a float is needed to maintain the water level within the portable trough. Trough is moved from paddock to paddock as needed.

Before Situation:

The setting takes place where livestock have open access to existing natural water supplies and/or poor grazing mgt. results in: poor water quality from soil erosion and manure deposit, poor grazing distribution and plant health, overgrazing, poor manure distribution, and poor animal health.

After Situation:

Improved: water/soil quality, grazing management, plant diversity and quality, manure distribution, water quality, and animal health. A hydrant is located in the pasture and is protected from trampling by a wooden post. A portable heavy duty polyethylene trough is part of an intensive rotational grazing management system. The trough is connected to a water supply system via quick coupler or frost free hydrant. The trough is secured to wooden posts to prevent overturning.

Feature Measure: Number of Freeze Proof Hydrants I

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $157.47

Scenario Cost/Unit: $157.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	10	$11.90
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	1	$20.64
Materials						
Freeze Proof Hydrant, <= 3' Bury	240	Freeze Proof Hydrant, 3 foot or less bury. Materials only.	Each	$80.05	1	$80.05
Pipe, PVC, ¾", SCH 40	972	Materials: - 3/4" - PVC - SCH 40 - ASTM D1785	Foot	$0.56	10	$5.60
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$1.61	10.79	$17.37

USDA - Natural Resources Conservation Service

Tennessee

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario #34 - 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 Yard

Scenario Typical Size: 1,613.0

Scenario Total Cost: $10,645.80

Scenario Cost/Unit: $6.60

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 Yard	$3.84	1613	$6,193.92
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	6	$348.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
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.	Hour	$106.41	2	$212.82
Materials						
Soil Dispersant	1490	Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent)	Ton	$483.91	6.53	$3,159.93
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 i	Dollar	$1.02	1	$1.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario #35 - 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 Yard

Scenario Typical Size: 3,226.0

Scenario Total Cost: $16,839.72

Scenario Cost/Unit: $5.22

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 Yard	$3.84	3226	$12,387.84
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	6	$348.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
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.	Hour	$106.41	2	$212.82
Materials						
Soil Dispersant	1490	Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent)	Ton	$483.91	6.53	$3,159.93
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 i	Dollar	$1.02	1	$1.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario #36 - 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 Yard

Scenario Typical Size: 1,613.0

Scenario Total Cost: $118,205.97

Scenario Cost/Unit: $73.28

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 Yard	$3.84	1613	$6,193.92
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	6	$348.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	7	$147.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	3	$319.23
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.21	5227	$110,864.67
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 i	Dollar	$1.02	1	$1.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

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Tennessee

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario #37 - 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 Yard

Scenario Typical Size: 1,613.0

Scenario Total Cost: $124,403.73

Scenario Cost/Unit: $77.13

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 Yard	$3.84	3227	$12,391.68
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	6	$348.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	7	$147.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	3	$319.23
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.21	5227	$110,864.67
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 i	Dollar	$1.02	1	$1.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario #38 - Material haul < 1 mile

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. 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 (including

Scenario Unit:: Cubic Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $26,140.31

Scenario Cost/Unit: $10.80

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 Yard	$3.84	2420	$9,292.80
Excavation, clay, large equipment, 1500 ft	1217	Bulk excavation of clay with scrapers with average haul distance of 1500 feet. Includes equipment and labor.	Cubic Yard	$6.57	1613	$10,597.41
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	807	$3,042.39
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.	Hour	$106.41	14	$1,489.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	3	$1,462.62

USDA - Natural Resources Conservation Service

Tennessee

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario #39 - Material haul > 1 mile

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 protection of the finished liner. 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.

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 Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $31,071.76

Scenario Cost/Unit: $12.84

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 Yard	$3.84	2420	$9,292.80
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hour	$88.65	20	$1,773.00
Excavation, clay, large equipment, 1500 ft	1217	Bulk excavation of clay with scrapers with average haul distance of 1500 feet. Includes equipment and labor.	Cubic Yard	$6.57	1613	$10,597.41
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	807	$3,042.39
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	$0.33	8065	$2,661.45
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	20	$497.00
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.	Hour	$106.41	14	$1,489.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	3	$1,462.62

Practice: 521A - Pond Sealing or Lining, Flexible Membrane

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: $25,776.72

Scenario Cost/Unit: $10.65

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	$2.30	2420	$5,566.00
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.	Hour	$26.89	40	$1,075.60
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.	Hour	$106.41	32	$3,405.12
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.50	2420	$15,730.00

USDA - Natural Resources Conservation Service

Tennessee

Practice: 521A - Pond Sealing or Lining, Flexible Membrane

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: $33,811.12

Scenario Cost/Unit: $13.97

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	$2.30	2420	$5,566.00
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.	Hour	$26.89	40	$1,075.60
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.	Hour	$106.41	32	$3,405.12
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.50	2420	$15,730.00
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$3.32	2420	$8,034.40

USDA - Natural Resources Conservation Service

Tennessee

Practice: 521A - Pond Sealing or Lining, Flexible Membrane

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: $28,875.60

Scenario Cost/Unit: $11.93

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	$2.30	2420	$5,566.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	807	$3,098.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	40	$1,075.60
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.	Hour	$106.41	32	$3,405.12
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.50	2420	$15,730.00

USDA - Natural Resources Conservation Service

Tennessee

Practice: 521A - Pond Sealing or Lining, Flexible Membrane

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: $36,910.00

Scenario Cost/Unit: $15.25

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	$2.30	2420	$5,566.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	807	$3,098.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	40	$1,075.60
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.	Hour	$106.41	32	$3,405.12
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.50	2420	$15,730.00
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$3.32	2420	$8,034.40

Practice: 527 - Karst Sinkhole Treatment

Scenario #1 - Sinkhole Treatment

Scenario Description:

Installing a sinkhole protection cap on a circular sinkhole with a vertical opening. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Sinkholes are routinely used for waste pits by landowners. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Typical Sinkhole treated is 30' Dia & 5' depth

After Situation:

Debris removed and properly disposed of off site. The sinkhole protection cap installation resolves the safety issue for people, livestock, & wildlife. The sinkhole is filled with porous material so as not to disrupt the hydrology of the karst system while filtering runoff. For this scenario, the sinkhole is assumed to be 5' deep. An inverted filter consisting of 1.5' of riprap and 2' of aggregate capped by 1.5' of compacted soil will be used. The gravel will be covered with geotextile fabric to prevent loss of soil. The concrete is removed from the components because the filter is supposed to be porous. The pipe is removed to avoid creating a direct conduit into the sinkhole. For practice units: total of 94 CY x 27 = 2538 CF

Feature Measure: Cubic Foot of Treatment

Scenario Unit:: Cubic Foot

Scenario Typical Size: 2,538.0

Scenario Total Cost: $5,548.46

Scenario Cost/Unit: $2.19

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	$2.30	65	$149.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	40	$126.00
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.	Hour	$114.38	16	$1,830.08
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.	Hour	$20.64	4	$82.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	16	$397.60
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	36	$1,081.80
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$34.33	29	$995.57
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	1800	$630.00

Practice: 527 - Karst Sinkhole Treatment

Scenario #2 - Debris removal and proper disposal

Scenario Description:

Removing and properly disposing of debris. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Sinkholes are routinely used for waste pits by landowners. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Typical Sinkhole treated is 30' Dia & 8' depth

After Situation:

Debris removed and properly disposed of off site. Associated practices to be used include 382 Fencing, 390 Riparian Herbaceous Buffer or 391 Riparian Forest Buffer or 393 Filter Strip to create a setback around the sinkhole.

Feature Measure: Each

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $840.56

Scenario Cost/Unit: $840.56

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.	Hour	$114.38	3	$343.14
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	$0.33	320	$105.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	3	$61.92
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	3	$74.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 528 - Prescribed Grazing

Scenario #1 - Pasture Standard (3-4 paddocks)

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.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely 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:

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. Grazing system success will be evaluated through short term monitoring.

Feature Measure: Acreage of paddocks

Scenario Unit:: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $924.89

Scenario Cost/Unit: $15.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	15	$426.60
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.	Hour	$38.33	13	$498.29

Practice: 528 - Prescribed Grazing

Scenario #2 - Pasture Intensive (5 or more paddocks)

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: trend, composition, production, etc.), record keeping, and routine fecal sample testing. Additional monitoring requires completion of training to adopt the new technology and a greater amount of labor that standard prescribed grazing.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely 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:

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. Grazing system success will be evaluated through short term monitoring. Livestock performance is increased and inputs are lowered through improved forage nutrition and cycling of nutrients within the pasture.

Feature Measure: Acreage of paddocks

Scenario Unit:: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $1,565.38

Scenario Cost/Unit: $26.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	20	$568.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	26	$996.58

Practice: 528 - Prescribed Grazing

Scenario #19 - Pasture Deferment

Scenario Description:

Defer the pasture for 90 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.

Before Situation:

Over-grazed pasture, a pasture with a low condition score, or a newly established pasture converted from cropland with a need for proper grazing management.

After Situation:

Improve the health and vigor of the sward, through deferment of grazing and improve the nesting habitat for wildlife.

Feature Measure: <Unknown>

Scenario Unit:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $474.28

Scenario Cost/Unit: $4.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6'8" x 24'. Includes equipment, power unit and labor costs.	Mile	$3.04	25	$76.00
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	$51.08	1	$51.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	5	$134.45
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20

Practice: 528 - Prescribed Grazing

Scenario #20 - Targeted Grazing

Scenario Description:

Management of woody non-herbaceous plant species through the use of off farm rented livestock (goats, sheep, llamas, etc.) that are closely herded by off farm livestock owner to concentrate grazing on targeted shrubs. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. This scenario is an alternative for organic producers.

Before Situation:

Area consist of dense stands of woody non-herbaceous species 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:

Woody species are grazed to limit the regrowth of shrubs 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, hydrology and plant health and vigor is returning to near normal levels.

Feature Measure: Acres Treated

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,311.69

Scenario Cost/Unit: $32.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6'8" x 24'. Includes equipment, power unit and labor costs.	Mile	$3.04	2	$6.08
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	4	$113.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	20	$412.80
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	$13.39	50	$669.50

Practice: 528 - Prescribed Grazing

Scenario #21 - Stockpiling Forage for Extended Grazing

Scenario Description:

Livestock are excluded from forages during late summer and fall months (approx. 90 days). The stockpiled forages are grazed at a later time using strip grazing to allow animals to utilize the forage within the strip for a specified period of time and thereby extending the grazing season. Resource Concerns include: DEGRADED PLANT CONDITION: Undesirable plant productivity and health, DEGRADED PLANT CONDITION – Inadequate structure and composition, LIVESTOCK PRODUCTION LIMITATION: Inadequate feed and forage, WATER QUALITY: Excess nutrients in surface water INEFFICIENT ENERGY USE - Equipment and Facilities/Farming/Ranching Practices, SOIL CONDITION - Organic Matter Depletion, SOIL EROSION - Sheet and Rill

Before Situation:

Pasture and/or hayland (cropland) - Current implementation of a grazing plan does not allow for extending the grazing season. Annual forage production is insufficient causing the producer to begin supplemental feeding earlier in the year and concentrating livestock on winter feeding areas. Vegetative cover on feeding areas is destroyed. Plant productivity/health and structure/composition is reduced by overgrazing. Producer must buy or cut and bale additional hay for supplemental feeding. Excess nutrients build up in hay feeding areas.

After Situation:

Managing grazing land to stockpile forages for later use extends the grazing season and promotes a move to yearlong grazing. Stockpiling also provides long term grass sustainability and improved forage health resulting in higher quality forage for livestock. Eliminating a minimum of one hay cutting reduces fuel use, labor and erosion potential. Water quality is improved because manure is more evenly distributed throughout the pasture as livestock graze and nutrient loading at hay feeding sites, if needed, is reduced. Typical Scenario Size - 20 acres

Feature Measure: Acre

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $805.11

Scenario Cost/Unit: $40.26

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	$65.00	1	$65.00
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	20	$568.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8.3	$171.31

Practice: 533 - Pumping Plant

Scenario #1 - Pump <= 1.5 HP

Scenario Description:

Typical application of a less than or equal to 1.5 HP pump at water source (well or spring) in order to pump water to appropriate locations within the prescribed grazing system. Pump enables the development of new watering sites that are removed from hydrologically sensitive areas and provide for a better distribution of animal wastes and associated nutrients. Cattle exclusion from surface water results in improved surface water quality, reduced erosion. Also used for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Scenario typically includes a pressure tank. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Livestock: A pump is needed to move water to provide proper flow rate for watering facility which is used as part of a prescribed grazing system.

After Situation:

A 1 HP pump is installed at water source (well or spring) in order to pump water uphill to appropriate locations within the prescribed grazing system. Pump enables the development of new watering sites that are removed from hydrologically sensitive areas and provide for a better distribution of animal wastes and associated nutrients. Cattle exclusion from surface water results in improved surface water quality, reduced erosion. Associated practices: Fence (382), Prescribed Grazing (528), Water Well (642), Pipeline (516), Spring Development (574), Watering Facility (614)

Feature Measure: Pump

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,592.10

Scenario Cost/Unit: $2,592.10

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 Yard	$230.94	0.6	$138.56
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	4	$225.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
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.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
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 Includes material and shipping only.	Each	$564.23	1	$564.23
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	$424.66	1	$424.66
Pressure Tank, 40 gallon	1038	Pressure Tank, 40 gallon. Includes materials and shipping only.	Each	$475.76	1	$475.76
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 533 - Pumping Plant

Scenario #2 - Water Ram

Scenario Description:

A water ram is used to transfer water from a live stream to a Watering Facility (614) or small Irrigation Reservoir (436) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614 or 436), without erosion or impairment to water quality. In the livestock scenario, 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 while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. The water ram may need to be fenced for protection from curious bovines. While it is generally not considered practical for irrigation, in the irrigation scenario, water can be retrieved from a stream and stored in a small 436 to provide water for a very small (0.1 acre) irrigation system. Resource Concerns: Insufficient stock water. Associated Practices: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Water in a nearby stream is not available at the desired location, pressure and/or flow rate.

After Situation:

A 2" diameter inlet pipe is installed and connected to a water ram pump with all appurtenances and anchored to a concrete pad (9 ft x 4 ft x 5 in) or other appropriate secure base. Depending upon the application, either a 1-inch diameter Livestock Pipeline (516) or an Irrigation Pipeline (430) is installed from the water ram to a 5,000 gallon storage facility. Improved water quantity or quality, grazing management, plant diversity, animal health, and/or irrigation purposes as outlined in the appropriate NRCS irrigation system standard. A 2" water ram, with 10 gpm of inlet flow and 10 feet of drop, can supply about 1.0 gpm to a location about 50 feet higher than the water ram.

Feature Measure: Number of Pumps

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,579.27

Scenario Cost/Unit: $1,579.27

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 Yard	$230.94	0.5	$115.47
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
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.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	12	$459.96
Materials						
Pump, Ram	1114	Ram pump kit, 2 inch. Includes materials and shipping only.	Each	$585.96	1	$585.96

Practice: 533 - Pumping Plant

Scenario #3 - Livestock Nose Pump

Scenario Description:

A Nose Pump is a diaphragm pump 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. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. 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 nose pump is adequate for 20 cattle. Resource Concerns: Insufficient stock water; 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 nose pump is installed with all appurtenances anchored to concrete pad 4 ' x 4 ' x 4" 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: $709.79

Scenario Cost/Unit: $709.79

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 Yard	$230.94	0.2	$46.19
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	4	$82.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Nose Pump	1052	Materials and delivery.	Each	$383.90	1	$383.90

Practice: 533 - Pumping Plant

Scenario #4 - Pump >1.5 HP and <= 5 HP

Scenario Description:

The typical scenario supports replacement of a pump in an existing micro irrigation system on cropland using a typical 4 HP pump. Size of pump is determined by required GPM derived from a design for specific irrigation system on cropland. Scenario could also be used for a 4 HP for silage leachate, barnyard runoff, and milkhouse waste (as part of a waste transfer system) at farm headquarters. Irrigation Setting: existing micro irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; or Waste Transfer Setting: various types of liquid waste at the headquarters is uncollected causing surface and ground water issues. 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. Also can be used as Livestock Water Pump for systems requiring larger than 1 HP.

Before Situation:

Irrigation Setting: existing micro irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; or Waste Transfer Setting: various types of liquid waste at the headquarters is uncollected causing surface and ground water issues. 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.

After Situation:

Irrigation Setting: For micro irrigation system, a properly designed pump is installed reducing water and energy usage. Waste Transfer Setting: For liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities. Associated practices: Waste Transfer (634), Irrigation Pipeline (430), Irrigation System, Micro-Irrigation (441), Heavy Use Area Protection (561), Irrigation Water Management (449),Waste Storage Facility (313), Vegetated Treatment Area (635)

Feature Measure: Pump Power Requirement

Scenario Unit:: Brake Horse Power

Scenario Typical Size: 4.0

Scenario Total Cost: $5,071.81

Scenario Cost/Unit: $1,267.95

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.	Hour	$56.37	3	$169.11
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	3	$65.73
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	3	$74.55
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 Includes material and shipping only.	Each	$564.23	1	$564.23
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	$424.66	4	$1,698.64
Manhole, 4' x 4'	1053	Precast Manhole with base and top delivered. 4' diameter x 4' depth. Materials only.	Each	$1,698.84	1	$1,698.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 533 - Pumping Plant

Scenario #5 - Pump >5 and <= 10 HP

Scenario Description:

The typical scenario supports replacement of a pump in an existing irrigation system (includes backflow prevention device or water meter as appropriate) on cropland with a typical 8 HP permanent pump. Size of pump is determined by required GPM derived from a design for specific irrigation system on cropland. Scenario could also be used for a 8 HP pump for silage leachate, barnyard runoff, and milkhouse waste (as part of a waste transfer system) at farm headquarters. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley.

Before Situation:

Irrigation Setting: Either an existing irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; or Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed reducing water and energy usage. Waste Transfer Setting: 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: Waste Transfer (634), Irrigation Pipeline (430), Irrigation System, Micro-Irrigation (441), Heavy Use Area Protection (561), Irrigation Water Management (449),Waste Storage Facility (313), Vegetated Treatment Area (635)

Feature Measure: Pump Power Requirement

Scenario Unit:: Brake Horse Power

Scenario Typical Size: 8.0

Scenario Total Cost: $5,846.50

Scenario Cost/Unit: $730.81

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.	Hour	$56.37	3	$169.11
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	3	$65.73
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$2,020.31	1	$2,020.31
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$128.60	8	$1,028.80
Manhole, 4' x 4'	1053	Precast Manhole with base and top delivered. 4' diameter x 4' depth. Materials only.	Each	$1,698.84	1	$1,698.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 533 - Pumping Plant

Scenario #6 - Pump >10 and <= 20 HP

Scenario Description:

This is a close-coupled, 3-phase, 15 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (600 gpm and 50 psi) sprinkler or large microirrigation (850 gpm and 35 psi) system or a large-sized surface irrigation system (1,200 gpm) or a large-sized (1,200 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. 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.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility or to a distribution system.

Feature Measure: Pump Power Requirement

Scenario Unit:: Brake Horse Power

Scenario Typical Size: 15.0

Scenario Total Cost: $10,316.05

Scenario Cost/Unit: $687.74

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 Yard	$230.94	2	$461.88
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	8	$450.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	56	$1,226.96
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	56	$1,155.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	56	$2,146.48
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$2,020.31	1	$2,020.31
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$128.60	15	$1,929.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 533 - Pumping Plant

Scenario #7 - Pump >20 HP

Scenario Description:

This is a close-coupled, 3-phase, 50 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a very large-sized surface irrigation system (2,800 gpm) or a very large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit:: Brake Horse Power

Scenario Typical Size: 50.0

Scenario Total Cost: $16,107.77

Scenario Cost/Unit: $322.16

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 Yard	$230.94	2	$461.88
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	8	$450.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	56	$1,226.96
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	56	$1,505.84
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.	Hour	$20.64	56	$1,155.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	56	$2,146.48
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$2,020.31	1	$2,020.31
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$128.60	50	$6,430.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 533 - Pumping Plant

Scenario #8 - Variable Frequency Drive

Scenario Description:

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time. Resource concerns: Insufficient water - Inefficient use of irrigation water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility.

Before Situation:

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s) need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or inefficient water application in the irrigation system.

After Situation:

VFD Modifications are implemented at the pump site to allow for varying the speed of a 40 Hp electric motor to match the pressure and flow requirements for a center pivot irrigation system.

Feature Measure: Pump Power Requirement

Scenario Unit:: Brake Horse Power

Scenario Typical Size: 50.0

Scenario Total Cost: $12,493.56

Scenario Cost/Unit: $249.87

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.	Hour	$26.89	4	$107.56
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$247.72	50	$12,386.00

Practice: 533 - Pumping Plant

Scenario #9 - Tractor Power Take Off (PTO) Pump

Scenario Description:

This scenario involves a PTO driven pump to either transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) to cropland or; to transfer semi-solid/ liquid manure (as part of a waste transfer system) at the farm headquarters from a Waste Storage Facility - 313, to an irrigation system or waste treatment facility. In both cases, a PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water issues. A transfer method for waste is needed. 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.

After Situation:

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 2,000 gallons per minute and is portable so that it can be used at several locations.

Feature Measure: Each

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $10,959.73

Scenario Cost/Unit: $10,959.73

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 Yard	$230.94	2	$461.88
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Materials						
Pump, Ag Water PTO, 1,000 GPM	1923	Materials, labor, controls: Ag Water PTO Pump 1,000 GPM - 8"	Each	$9,850.81	1	$9,850.81

Practice: 533 - Pumping Plant

Scenario #11 - Electric Sump Pump <= 5 Hp

Scenario Description:

A 3 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated water needs to be moved to a containment facility.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

Feature Measure: Pump Power Requirement

Scenario Unit:: Brake Horse Power

Scenario Typical Size: 3.0

Scenario Total Cost: $2,037.03

Scenario Cost/Unit: $679.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	3	$61.92
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.	Hour	$38.33	3	$114.99
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 Includes material and shipping only.	Each	$564.23	1	$564.23
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	$424.66	3	$1,273.98

Practice: 533 - Pumping Plant

Scenario #34 - Photovoltaic <= 0.5 HP Pump

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stock water. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of a 230-watt photovoltaic (PV) panel, capable of operating a 1/4 Hp (0.25 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1/4 Hp solar-powered submersible pump to deliver about 1.5 gpm and develop a pressure at the pump outlet of about 60 psi.). 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. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Number of Pumps

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,602.86

Scenario Cost/Unit: $4,602.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	3	$65.73
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	8	$306.64
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 Includes material and shipping only.	Each	$564.23	1	$564.23
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	$424.66	0.25	$106.17
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	$472.52	1	$472.52
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	$8,474.04	0.3	$2,542.21

Practice: 554 - Drainage Water Management

Scenario #1 - Drainage Water Management (DWM)

Scenario Description:

This scenario is the process of managing water discharges from surface and/or subsurface agricultural drainage systems by reducing nutrient loading into surface waters. Typical systems consist of a 75 acre field with existing drainage tile lines and installed water control structures. The operator goes to 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; 3 structures control field water levels and 2 structures control a single denitrifying bioreactor. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management .

Before Situation:

Existing drainage systems are in place and water flows uncontrolled.

After Situation:

Existing drainage systems are managed to reduce flow of field drainage waters from the site and reduce nitrate loading by denitrification.

Feature Measure: Number of Control Structures

Scenario Unit:: Each

Scenario Typical Size: 5.0

Scenario Total Cost: $424.80

Scenario Cost/Unit: $84.96

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	$65.00	0.33	$21.45
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	15	$403.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 558 - Roof Runoff Structure

Scenario #1 - Gutters and downspouts

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s) and splashguards. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. 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:

Gutters, downspouts and splashguards servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln. ft. serviced with gutter, downspouts, and appurtenances.

Feature Measure: Linear Length of Roof to be Gutter

Scenario Unit:: Foot

Scenario Typical Size: 180.0

Scenario Total Cost: $975.66

Scenario Cost/Unit: $5.42

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	$2.30	6	$13.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	4	$82.56
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	1	$30.05
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Foot	$2.76	180	$496.80
Downspout, Aluminum, Small	1700	Aluminum downspout (3" to 5") in width with hangers. Materials only.	Foot	$2.72	60	$163.20
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	$171.75	1	$171.75
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	$0.35	50	$17.50

Practice: 558 - Roof Runoff Structure

Scenario #2 - Gutters, downspouts and fascia boards

Scenario Description:

A roof runoff structure, consisting of gutter(s) and downspout(s) only. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. 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 downspout servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln. ft. serviced with gutter, downspouts, and appurtenances.

Feature Measure: Linear Length of Roof to be Gutter

Scenario Unit:: Foot

Scenario Typical Size: 180.0

Scenario Total Cost: $1,534.58

Scenario Cost/Unit: $8.53

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	$2.30	6	$13.80
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.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	4	$82.56
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	1	$30.05
Dimension Lumber, untreated, rot resistant	1613	Untreated dimension lumber with nominal thickness equal or less than 2" milled from a rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Foot	$1.91	180	$343.80
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Foot	$2.76	180	$496.80
Downspout, Aluminum, Small	1700	Aluminum downspout (3" to 5") in width with hangers. Materials only.	Foot	$2.72	60	$163.20
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	$171.75	1	$171.75
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	$0.35	50	$17.50

Practice: 558 - Roof Runoff Structure

Scenario #3 - Gutters, downspouts and 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 180 ln. ft. serviced with gutter, downspouts, and appurtenances. A 1,500 gallon tank is installed for storage and use of roof runoff.

Feature Measure: Linear Length of Roof to be Gutter

Scenario Unit:: Foot

Scenario Typical Size: 180.0

Scenario Total Cost: $3,209.98

Scenario Cost/Unit: $17.83

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	$2.30	9	$20.70
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	2	$4.06
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	1	$26.89
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	7	$144.48
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2	$60.10
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	100	$632.00
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	1500	$1,455.00
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Foot	$2.76	180	$496.80
Downspout, Aluminum, Small	1700	Aluminum downspout (3" to 5") in width with hangers. Materials only.	Foot	$2.72	60	$163.20
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	$171.75	1	$171.75
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	$0.35	100	$35.00

Practice: 558 - Roof Runoff Structure

Scenario #4 - Concrete Curb

Scenario Description:

A roof runoff structure, consisting of a concrete curb or parabolic 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 curb. 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 curb or parabolic channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete curb (6" high - 2' wide) 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:: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $2,490.52

Scenario Cost/Unit: $12.45

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 Yard	$113.81	10	$1,138.10
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	16	$36.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	30	$60.90
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	6	$61.32
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	$0.33	60	$19.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	7	$207.55
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	7	$210.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
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	$0.35	700	$245.00

Practice: 558 - Roof Runoff Structure

Scenario #5 - Trench Drain

Scenario Description:

A roof runoff structure, consisting of a trench filled with rock, with a polyethylene, corrugated, perforated drain tile installed in trench bottom. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. 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 2' deep by 3' wide by 200 long deep rock filled, tile drained trench and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion.

Feature Measure: Linear Length of Roof to be Draine

Scenario Unit:: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $2,495.06

Scenario Cost/Unit: $12.48

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	$2.30	222	$510.60
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 Yard	$2.03	44	$89.32
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.	Hour	$20.64	6	$123.84
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	44	$1,322.20
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	$0.48	220	$105.60
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	$171.75	2	$343.50

Practice: 558 - Roof Runoff Structure

Scenario #6 - Drip pad

Scenario Description:

A roof runoff structure, consisting of a pad filled with rock located at the drip line of a building. Used to provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. 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 6" deep by 2' wide by 200 long deep rock filled splash pad, servicing the portion of the building roof that creates erosion and addresses a water quality resource concern.

Feature Measure: Linear length of roof to be drained

Scenario Unit:: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $709.42

Scenario Cost/Unit: $3.55

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 Yard	$2.03	7.4	$15.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	7.4	$222.37
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	$171.75	1	$171.75
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	$0.35	740	$259.00

Practice: 558 - Roof Runoff Structure

Scenario #7 - Roof runoff storage tank

Scenario Description:

A roof runoff storage tank is added to an existing structure with gutters and downspouts that meet our 558 Roof Runoff Structure standard. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use. Must be coupled with a stable outlet for any excess to ground surface in a way that avoids erosion (typically combined with 620 Underground Outlet). Facilitates water 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 structure is already in place/is included in an overall plan for waste management; (2) roof runoff needs to be stored and used with any possible overflow 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:

Storage tank added to existing gutters and downspouts that meet NRCS standards and are servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln. ft. serviced with a water storage tank added. A 1,500 gallon tank is installed for storage and use of roof runoff.

Feature Measure: Gallons of storage capacity

Scenario Unit:: Gallon

Scenario Typical Size: 1,500.0

Scenario Total Cost: $2,435.82

Scenario Cost/Unit: $1.62

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	$2.30	9	$20.70
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	2	$4.06
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	1	$26.89
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	3	$61.92
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2	$60.10
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	95	$600.40
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	1500	$1,455.00
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	$171.75	1	$171.75
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	$0.35	100	$35.00

Practice: 560 - Access Road

Scenario #1 - New 6 inch gravel road in level terrain

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in relatively level ground. 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 level terrain lands.

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top. It is 90% on original ground with 10% on fill with an average fill height of 1 foot. 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:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $13,040.37

Scenario Cost/Unit: $13.04

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	$2.30	1670	$3,841.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	60	$230.40
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	60	$189.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	24	$1,596.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	0.7	$4.66
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	0.7	$7.48
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.	Acre	$12.67	0.1	$1.27
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	0.6	$12.89
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hour	$44.96	0.7	$31.47
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	1	$26.89
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
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	$0.57	28	$15.96
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	$0.48	35	$16.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	35	$12.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1.1	$36.04

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	275	$5,698.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	1.4	$182.70
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	0.1	$3.16
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.6	$26.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 560 - Access Road

Scenario #2 - Rehabilitation of existing gravel road in level terrain

Scenario Description:

Repair and rehabilitation of gravel road with min. 6 inch thick compacted gravel surface on existing alignment in level terrain. The extent of construction work over an existing alignment is assumed to average 50% of the work for a new installation. 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 with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of level terrain lands.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width with a 6" gravel surface at the top, mostly in original ground. Less than 10% of the total is in fill with an average height of 1' and typical side slopes 2:1. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. 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:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $6,383.65

Scenario Cost/Unit: $6.38

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	$2.30	835	$1,920.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	30	$115.20
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	30	$94.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
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.	Acre	$12.67	0.07	$0.89
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.	Hour	$26.89	3	$80.67
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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	$0.57	2.8	$1.60
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	$0.48	3.5	$1.68
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	3.5	$1.26
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.1	$3.28
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	140	$2,900.80
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.15	$19.58
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	0.07	$2.21
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 560 - Access Road

Scenario #3 - New 6 inch gravel road in sloped terrain

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface on sloped ground. 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 land areas with sloped terrain.

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top. Seventy percent will be on original ground with 15% in embankment less than 2 feet in depth (average 1 foot) and 15% in excavation less than 2 feet in height (average 1 ft) with typical side slopes 2:1. The excavation is assumed to be 80% common earth and 20% rock excavation. 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 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:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $16,485.69

Scenario Cost/Unit: $16.49

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	$2.30	1670	$3,841.00
Excavation, Rock, Ripping	47	Excavation, rock, mechanical ripping, includes equipment and labor	Cubic Yard	$4.31	18	$77.58
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	72	$146.16
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	90	$345.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	90	$283.50
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$195.23	24	$4,685.52
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	0.6	$3.99
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	0.6	$6.41
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.1	$1.27
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	0.5	$10.74
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	1	$26.89
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
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	$0.57	24	$13.68
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	$0.48	30	$14.40

Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	30	$10.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.9	$29.48
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	275	$5,698.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	1.2	$156.60
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.6	$26.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 560 - Access Road

Scenario #4 - Rehabilitation of existing gravel road in sloped terrain

Scenario Description:

Repair and rehabilitation of gravel road with min. 6 inch thick compacted gravel surface on existing alignment in sloped terrain. The extent of construction work over an existing alignment is assumed to average 40% of the work for a new installation. 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 with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dust. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of land with steep sloped terrain.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width with a 6" gravel surface at the top. Approximately 85% of the road surface will need some regrading for 50% of the surface. The areas previously cut to install this road need no additional cut. The 15% of the road that has fill material will need to be refilled for 50% of the area. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. 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:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $6,864.11

Scenario Cost/Unit: $6.86

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	$2.30	835	$1,920.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	45	$172.80
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	45	$141.75
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	8	$997.76
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.07	$0.89
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.	Hour	$26.89	3.5	$94.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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	$0.57	2.8	$1.60
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	$0.48	3.5	$1.68
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	3.5	$1.26
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.1	$3.28
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	135	$2,797.20
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.15	$19.58
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	0.07	$2.21

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 561 - Heavy Use Area Protection

Scenario #1 - Reinforced Concrete, no curb

Scenario Description:

An eroding area around a watering trough will be stabilized with a reinforced concrete pad with no curb. Installation includes all materials, equipment, vegetation of disturbed areas, and labor to install this practice. Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

The area around a watering trough is muddy and eroding due to trampling by animals as they use the trough.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of approximately 12 cubic yards of welded wire mesh reinforced concrete (6” thick) with 8 cubic yards of sand or gravel foundation material (4” deep). Excavation of about 20 CY of soil is required. The removed material will be spread in the adjacent area to a depth of 2”. Approximately 400 square feet of disturbed areas and 3200 sf of spoil area is seeded.

Feature Measure: Area

Scenario Unit:: Square Foot

Scenario Typical Size: 630.0

Scenario Total Cost: $3,654.80

Scenario Cost/Unit: $5.80

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 Yard	$230.94	12	$2,771.28
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	4	$179.40
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.1	$1.27
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	3	$61.92
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	8	$240.40
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	$0.57	4	$2.28
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	$0.48	5	$2.40
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	5	$1.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.15	$4.91
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.2	$26.10
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.1	$3.79
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.1	$4.49
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service **Tennessee**

Practice: 561 - Heavy Use Area Protection

Scenario #2 - Rock/Gravel on Geotextile

Scenario Description:

An eroding area where there is winter feeding of livestock will be stabilized with a rock and/or gravel pad on a geotextile fabric foundation. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Typical situation is in a pasture setting where a small herd (< 30 head) is fed at a small winter feeding area away from surface water bodies. This pad is usually shared by 2 or more rotated pastures and has good grass or other filter area between it and water conveyance. The feeding area is muddy and eroding.

After Situation:

The stabilized area is surfaced with approximately 1624 square feet (28 ft x 58 ft x 6 in thick) of rock/gravel over a geotextile. Approximately 200 square yards of geotextile fabric will be used. Excavation of 30 CY of material will be needed. The removed material will be spread in the adjacent area to a depth of 2”. Revegetation of disturbed areas is assumed to extend 10 feet from the perimeter of the pad (2120 sf) and will include the spoil area of 4862 sf.

Feature Measure: Area of Rock and or Gravel

Scenario Unit:: Square Foot

Scenario Typical Size: 1,624.0

Scenario Total Cost: $2,369.97

Scenario Cost/Unit: $1.46

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.	Hour	$44.85	8	$358.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.16	$2.03
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.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	30	$901.50
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	$0.57	6.4	$3.65
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	$0.48	8	$3.84
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	8	$2.88
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.24	$7.86
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	200	$250.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.32	$41.76
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.16	$6.07
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.16	$7.19
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 561 - Heavy Use Area Protection

Scenario #5 - Concrete Slab with curb (reinforced)

Scenario Description:

A concrete pad with a curb is intensively used by larger herds (> 50 head) of livestock typically concentrated year round. Manure and wasted feed are collected/transferred very frequently (daily to every other day) to a storage facility. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation. A concrete pad with a curb is intensively used by larger herds (> 50 head) of livestock typically concentrated year round. Manure and wasted feed are collected/transferred very frequently (daily to every other day) to a storage facility. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Cattle are fed in a concentrated area all year round. Animal waste is causing a resource concern because it is difficult to collect from the existing earthen surface.

After Situation:

The stabilized area is 40' x 100'x 5.5” thick reinforced concrete pavement on 49 cubic yards of compacted, graded aggregate gravel material. The site has a slope of less than or equal to 10%. The concrete HUA is designed to support heavy equipment loads for manure management. It provides a permanent area of steel reinforced 5.5" thick concrete (typically #4 or #5 rebar on 12" centers). A 12 inch tall by 8 inch wide reinforced concrete curb is included around the perimeter of the slab to contain scraped waste materials for transport to storage facility. The curb extends down the long sides of the pad. A 18" wide by 12" deep footer is placed along the short sides of the pad which will have tractor access. Excavation of 111 CY of material will be needed. The removed material will be spread in the adjacent area to a depth of 2”. Revegetation of disturbed areas is assumed to extend 10 feet from the perimeter of the pad (3200 sf) and will include the spoil area of about 18,000 sf.

Feature Measure: Area of concrete

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $25,479.72

Scenario Cost/Unit: $6.37

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 Yard	$230.94	68	$15,703.92
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 Yard	$359.17	10	$3,591.70
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$195.23	8	$1,561.84
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	8	$358.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.5	$6.34
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	24	$495.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	16	$397.60
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.	Hour	$38.33	24	$919.92
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	49	$1,472.45
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	$0.57	20	$11.40

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	$0.48	25	$12.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	25	$9.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.75	$24.57
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	1	$130.50
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.5	$18.96
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.5	$22.47
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 561 - Heavy Use Area Protection

Scenario #6 - Concrete(reinforced) Curb on existing slab

Scenario Description:

This practice is typically associated with confined animal feeding operation but can be considered for larger herds (> 50 head) on multiple pasture-based grazing systems where animals are managed in controlled central area for winter feeding and lounging. A Comprehensive Nutrient Management Plan (CNMP) would usually address use of this scenario on a confined animal feeding operation. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Before the practice is installed cattle waste accumulates on the slab but can run off the edges of the slab since there are no curbs to contain it.

After Situation:

A 12" tall by 8" wide reinforced concrete curb is installed on the two long sides of an existing 100’ x 40’ concrete slab. The curb is typically reinforced with #4 or #5 steel bars. The curbs will aid in manure management and reduce water quality degradation.

Feature Measure: Length of concrete curb in Ln Ft

Scenario Unit:: Foot

Scenario Typical Size: 280.0

Scenario Total Cost: $3,973.29

Scenario Cost/Unit: $14.19

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 Yard	$359.17	7	$2,514.19
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	24	$495.36
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.	Hour	$38.33	24	$919.92

Practice: 561 - Heavy Use Area Protection

Scenario #7 - Reinforced concrete slab on a hillside site

Scenario Description:

A concrete pad with a curb is intensively used by larger herds (> 50 head) of livestock typically concentrated year round. Manure and wasted feed are collected/transferred very frequently (daily to every other day) to a storage facility. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Cattle are fed in a concentrated area. Animal waste is causing a resource concern as it is not being captured and properly utilized.

After Situation:

The stabilized area is 40' x 100'x 5.5” thick reinforced concrete pavement on 49 cubic yards of compacted, graded aggregate gravel material. The site has a slope of less than or equal to 10%. The concrete HUA is designed to support heavy equipment loads for manure management. It provides a permanent area of steel reinforced 5.5" thick concrete (typically #4 or #5 rebar on 12" centers). A 12 inch tall by 8 inch wide reinforced concrete curb is included around the perimeter of the slab to contain scraped waste materials for transport to storage facility. The curb extends down the long sides of the pad. An 18" wide by 12" deep footer is placed along the short sides of the pad which will have tractor access. Excavation and re-placement of 634 CY of material will be needed. Cuts and fills will be balanced. The removed material will be spread in the adjacent area to a depth of 2”. Revegetation of disturbed areas is assumed to extend 25 feet from the perimeter of the pad (8000 sf).

Feature Measure: Area of concrete

Scenario Unit:: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $33,540.03

Scenario Cost/Unit: $8.39

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 Yard	$230.94	68	$15,703.92
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 Yard	$359.17	10	$3,591.70
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	634	$2,434.56
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	4	$225.48
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$195.23	32	$6,247.36
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.18	$2.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	36	$894.60
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.	Hour	$38.33	32	$1,226.56
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	49	$1,472.45
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	$0.57	7.2	$4.10
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	$0.48	9	$4.32
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	9	$3.24

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.27	$8.85
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.36	$46.98
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.18	$6.83
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.18	$8.09
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 561 - Heavy Use Area Protection

Scenario #8 - Concrete Slab, not rebar reinforced

Scenario Description:

A small winter feeding area will be stabilized by installation of a 5 inch thick concrete slab that is .not rebar reinforced. Waste materials are removed periodically from the pad with small front end loader tractor and land applied at appropriate times. This practice is typically associated with pasture grazing operations and would be located to serve 2 or more pastures. Installation includes all materials, equipment, vegetation of disturbed areas, and labor to install this practice. Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

This scenario addresses stabilizing soil areas where livestock are fed, typically during winter months. Typical herd size is small to medium (~30 to 50 head). Currently the cattle are winter fed on the ground and they disturb the soil, degrading soil quality. Animal waste is also able to run off the site, causing potential degradation to water quality.

After Situation:

The 25' by 25' x 5.5” thick (630 square foot) stabilized area is surfaced with approximately 11 cubic yards of concrete with fiber reinforcement on 8 cubic yards of graded aggregate gravel material for surfacing areas. Excavation of about 18 CY of soil is required. The removed material will be spread in the adjacent area to a depth of 2”. Approximately 1400 square feet of disturbed areas and 3020 sf of spoil area is reseeded.

Feature Measure: Area of concrete

Scenario Unit:: Square Foot

Scenario Typical Size: 630.0

Scenario Total Cost: $2,735.82

Scenario Cost/Unit: $4.34

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.	Hour	$44.85	4	$179.40
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.1	$1.27
Concrete, CIP, Slab on Grade, fiber reinforced	2001	Fiber reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$174.02	11	$1,914.22
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	8	$240.40
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	$0.57	4	$2.28
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	$0.48	5	$2.40
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	5	$1.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.15	$4.91
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.2	$26.10
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.1	$3.79
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.1	$4.49
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 570 - Stormwater Runoff Control

Scenario #1 - 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 storm water 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 permanent vegetation will use Critical Area Planting (342).

Feature Measure: Area of construction site

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $731.26

Scenario Cost/Unit: $731.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1.5	$32.87
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.	Hour	$20.64	10	$206.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1.5	$57.50
Materials						
Silt Fence	43	Silt Fence with support post. Includes materials, equipment and labor	Foot	$0.79	100	$79.00
Wattles, straw, 8-9"x25'	1405	Tubes of rice straw, approximately 8-9 inch in diameter, 25 feet long . Includes materials and shipping only (including stakes).	Foot	$1.01	100	$101.00
Straw bales	2186	Straw bales buried at defined intervals to halt rill and gulley formation. Materials and shipping only.	Each	$5.08	25	$127.00
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 i	Dollar	$1.02	125	$127.50

Practice: 570 - Stormwater Runoff Control

Scenario #2 - Silt Fence

Scenario Description:

This scenario involves installation of silt fence on construction sites as part of a conservation engineering system. The system 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 situation.

Before Situation:

The silt fence scenario is applicable in all construction sites and watersheds. Lack of erosion control is resulting in sediment filled runoff entering surface waters.

After Situation:

When properly installed, silt fences can slow down runoff flow velocity and reduce high velocity erosion, detain and filter the storm water runoff and provide a controlled release to the downstream areas. Silt fences also help to protect lakes, ponds, rivers and streams from sediment pollution. . 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. If earthen basins are warranted for water quality improvement purpose, 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: Linear Foot of Silt Fence Installed

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,358.84

Scenario Cost/Unit: $2.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	16	$350.56
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16	$613.28
Materials						
Silt Fence	43	Silt Fence with support post. Includes materials, equipment and labor	Foot	$0.79	500	$395.00

Practice: 574 - Spring Development

Scenario #1 - Large spring with Concrete Cutoff Wall

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing 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) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

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.

Feature Measure: Number of Developments

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,816.88

Scenario Cost/Unit: $3,816.88

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 Yard	$359.17	2	$718.34
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	11	$25.30
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	16	$901.92
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.	Hour	$20.64	32	$660.48
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	2	$59.30
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2	$60.10
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.57	20	$71.40
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	$0.48	50	$24.00
Pipe, CMP, 48", 14 Gauge	1280	48" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	$40.33	6	$241.98
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	$172.36	1	$172.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70
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	$0.35	100	$35.00

Practice: 574 - Spring Development

Scenario #2 - Small Spring with Concrete Cutoff Wall

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock, irrigation, wildlife needs, etc. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 40 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (40 ft long) and behind a concrete cutoff wall (6 inch x 3 ft height x 8 ft long) to retain water. Water is directed (via 10 ft long, 4 inch PVC) to a spring box (18 inch diameter x 6 ft long HDPE Corrugated, Smooth Wall) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

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.

Feature Measure: Number of Developments

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,356.58

Scenario Cost/Unit: $1,356.58

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 Yard	$359.17	0.45	$161.63
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	9	$20.70
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	4	$225.48
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.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	2	$59.30
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2	$60.10
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.57	10	$35.70
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	$0.48	40	$19.20
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	38.4	$69.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	100	$35.00

Practice: 574 - Spring Development

Scenario #3 - Small Spring with Compacted Clay Cutoff Wall

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock, irrigation, wildlife needs, etc. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 40 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (40 ft long) and behind a compacted clay cutoff wall (2' x 3 ft height x 8 ft long) to retain water. Water is directed (via 10 ft long, 4 inch PVC) to a spring box 6 ft long 18 inch HDPE Corrugated, Smooth Wall) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation has 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.

Feature Measure: Number of Developments

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,203.03

Scenario Cost/Unit: $1,203.03

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	$2.30	9	$20.70
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	4	$225.48
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 Yard	$2.16	2	$4.32
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.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	2	$59.30
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2	$60.10
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.57	10	$35.70
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$3.75	1	$3.75
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	$0.48	40	$19.20
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	38.4	$69.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	100	$35.00

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Practice: 574 - Spring Development

Scenario #4 - Small Spring with Compacted Clay Cutoff Wall with Tank

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock, irrigation, wildlife needs, etc. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 40 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (40 ft long) and behind a compacted clay cutoff wall (2' x 3 ft height x 8 ft long) to retain water. Water is directed (via 10 ft long, 4 inch PVC) to a spring box 6 ft long 18 inch HDPE Corrugated, Smooth Wall) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. Because the spring is low flow, water must be collected overnight to meet the resource needs. Aa outflow pipe from the spring box is directed into a 1550 gallon storage tank (with overflow as needed) down slope of the spring and placed on 4" thick concrete pad, where stored water is distributed to livestock watering facilities, crops or both. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342), Underground Outlet (620).

Before Situation:

Livestock and crop operation has inadequate quantity and quality of fresh water 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.

Feature Measure: Number of Developments

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,208.22

Scenario Cost/Unit: $3,208.22

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 Yard	$359.17	1.1	$395.09
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	9	$20.70
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	4	$225.48
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 Yard	$2.16	2	$4.32
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.	Hour	$20.64	20	$412.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	2	$59.30
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2.8	$84.14
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.57	10	$35.70
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	1550	$1,503.50
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$3.75	1	$3.75
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	$0.48	40	$19.20
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$1.82	38.4	$69.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	100	$35.00

Practice: 575 - Trails and Walkways

Scenario #2 - Vegetated Trail

Scenario Description:

A vegetated trail is installed to facilitate the movement of animals, people, or off-road vehicles in order to provide or improve access to forage, water, working/handling facilities, and/or shelter; improve grazing efficiency and distribution; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide trails for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, surfacing material, and all equipment, labor and incidental materials necessary to install the practice. Vegetation of areas disturbed by construction is included. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice also applies to a trail constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

The existing access to the site is located adjacent to a stream and needs to be moved to prevent erosion of materials into the stream. Only animal or ATV access is needed. The trail has very limited usage and soils are suitable for a vegetative surface.

After Situation:

The typical trail is a 12 foot wide, 300 foot long, lane of vegetated earth. This scenario includes vegetation of 3600 square foot for surfacing and vegetation of 1800 square feet of disturbed areas beside the trail. Stream Crossing (Code 578) will be used where the trail crosses a stream or shallow water area. Consider the use of water bars to control and direct water flow in the trail per the criteria in Access Road (Code 560). All culverts for drainage features will be applied under Structure for Water Control (Code 587). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Use Fencing (Code 382) when needed to control animal movement. The vegetation of this trail will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of trail

Scenario Unit:: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $1,242.13

Scenario Cost/Unit: $0.35

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.	Hour	$44.85	8	$358.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	0.12	$2.58
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.	Hour	$26.89	4	$107.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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	$0.57	4.8	$2.74
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	$0.48	6	$2.88
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	6	$2.16
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.18	$5.90
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.24	$31.32
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.12	$4.55
Three Species Mix, Cool Season, Native Perennial Grass	2316	Cool season, native grass mix. Includes material and shipping only.	Acre	$139.51	0.12	$16.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 575 - Trails and Walkways

Scenario #3 - Reinforced Concrete Walkway

Scenario Description:

Construct an reinforced concrete walkway on a gravel 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; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide walkways for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, reinforced concrete surfacing, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a walkway constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

A dairy operation moves cows from the pasture/loafing area to the milking parlor and back twice daily. The existing earthen path is covered in manure and is difficult to clean.

After Situation:

The typical walkway is 12 foot wide and 300 foot long and is constructed of reinforced concrete. Approximately 1800 square feet of disturbed area along the walkway and 8500 square feet (4 inches deep) of spoil area will be vegetated. The walkway will require approximately 106 CY of excavation (9.5 inches deep), 62 CY of reinforced concrete (5.5 inches thick), and 45 CY gravel foundation (4 inches thick). Stream Crossing (Code 578) will be used when the walkway crosses a stream or shallow water area. Culverts for drainage features will be applied using Structure for Water Control (Code 587). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Fencing (Code 382) will be used when needed to control animal movement. The concrete surface material for the walkway will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of Walkway

Scenario Unit:: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $17,827.67

Scenario Cost/Unit: $4.95

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 Yard	$230.94	62	$14,318.28
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 Yard	$2.03	106	$215.18
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.3	$3.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.3	$3.80
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.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	45	$1,352.25
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	$0.57	12	$6.84
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	$0.48	15	$7.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	15	$5.40

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.45	$14.74
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.6	$78.30
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.3	$11.38
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.3	$13.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 575 - Trails and Walkways

Scenario #4 - Rock/Gravel on Geotextile, Walkway

Scenario Description:

A walkway with a rock and/or gravel surface treatment over a geotextile fabric foundation will be installed 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; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide walkways for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, rock and/or gravel, geotextile, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a walkway constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

A beef operation moves cattle between pastures frequently. The existing earthen path is eroding and muddy.

After Situation:

The typical walkway is 12 foot wide and 300 foot long and is constructed of rock and/or gravel on a geotextile fabric foundation. The walkway will require approximately 67 CY of excavation, 67 CY of aggregate gravel, 460 SY of geotextile fabric (1.15 x 400 SY to account for overlap), and 7200 square feet of vegetation of the disturbed area (1800 square feet) and spoil area (5400 square feet). Stream Crossing (Code 578) will be used when the walkway crosses a stream or shallow water area. All culverts for drainage features will be applied under Structure for Water Control (Code 587). Consider the use of water bars to control and direct water flow in the walkway per the criteria in Access Road (Code 560). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Fencing (Code 382) will be used when needed to control animal movement. The surface material for the walkway will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of Walkway

Scenario Unit:: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $6,071.82

Scenario Cost/Unit: $1.69

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 Yard	$2.03	67	$136.01
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	67	$211.05
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.3	$3.80
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.	Hour	$26.89	8	$215.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	67	$2,013.35
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	$0.57	12	$6.84
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	$0.48	15	$7.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	15	$5.40
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.45	$14.74

Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	460	$2,028.60
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.6	$78.30
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.3	$11.38
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.3	$13.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 576 - Livestock Shelter Structure

Scenario #1 - Prefabricated Portable Shade Structure

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 10 ft x 20 ft prefab portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

Before Situation:

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit:: Square Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $1,101.39

Scenario Cost/Unit: $5.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	3	$114.99
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 Foot	$3.23	200	$646.00

Practice: 576 - Livestock Shelter Structure

Scenario #2 - Portable Shade Structure

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 25 ft x 40 ft portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

Before Situation:

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit:: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,036.04

Scenario Cost/Unit: $4.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hour	$20.53	16	$328.48
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.	Hour	$26.89	16	$430.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Materials						
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	25	$34.50
Steel, Plate, 3/16"	1048	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	$5.89	2	$11.78
Pipe, Steel, 1 ¼", SCH 40	1103	Materials: - 1 1/4" - Steel SCH 40	Foot	$4.12	94	$387.28
Pipe, Steel, 2", SCH 40	1105	Materials: - 2" - Steel SCH 40	Foot	$6.61	185	$1,222.85
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Foot	$1.21	1000	$1,210.00
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	$70.51	1	$70.51

Practice: 578 - Stream Crossing

Scenario #2 - Hard armored low water crossing

Scenario Description:

Stabilize the channel bottom and bank access slope within stream channel using rock riprap or cast in place concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with rock riprap or cast in place concrete on channel bottom and approaches. Final travel surface is 6" gravel(or concrete) surface. Scenario is for a crossing a 6' deep, 30' wide channel (this includes bank to bank computations), access slope of 4:1 SS, with riprap protected cut back banks at 2:1, width is 12 feet for a total length of 78' or area as 936 sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic or not for moving animals, vehicles or humans across or fording stream.

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 could be (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 Foot

Scenario Typical Size: 936.0

Scenario Total Cost: $7,353.99

Scenario Cost/Unit: $7.86

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.	Hour	$56.37	10	$563.70
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	10	$972.60
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	112	$188.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	20	$497.00
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	47	$3,522.18
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	17	$510.85
Floating Turbidity Curtain, Permeable, 4'	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Foot	$19.12	20	$382.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 578 - Stream Crossing

Scenario #3 - 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 water flow 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 could be (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: $4,926.04

Scenario Cost/Unit: $4.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	3	$15.21
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$114.38	10	$1,143.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	2	$149.88
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	50	$1,502.50
Pipe, HDPE, CPT, Double Wall, Soil Tight, 30"	1247	Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$30.71	40	$1,228.40
Floating Turbidity Curtain, Permeable, 4'	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Foot	$19.12	20	$382.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 578 - Stream Crossing

Scenario #4 - Low water crossing using prefabricated products

Scenario Description:

To install a stable crossing medium on channel bottom and approaches. Medium includes but not limited to precast concrete blocks, geocells, pavers, and gabions. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 30 foot bottom width and approaches. Width is 14 feet for a total area as 420sf. Use (396) Aquatic Organism Passage instead, 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:

Access road and water flow 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 could be (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: low water crossing

Scenario Unit:: Square Foot

Scenario Typical Size: 420.0

Scenario Total Cost: $3,475.76

Scenario Cost/Unit: $8.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	2	$194.52
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	18	$30.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	6	$177.90
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	18	$540.90
GeoCell, 4"	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	$25.49	50	$1,274.50
Floating Turbidity Curtain, Permeable, 4'	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Foot	$19.12	20	$382.40

Practice: 580 - Streambank and Shoreline Protection

Scenario #1 - Vegetative

Scenario Description:

Protection of streambanks consisting of 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, critical area vegetation and erosion control fabric; 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; 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 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. 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: Square Foot of Streambank/Shoreli

Scenario Unit:: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $16,883.60

Scenario Cost/Unit: $0.84

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 Yard	$2.03	2500	$5,075.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	16	$1,064.00
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.	Acre	$12.67	0.46	$5.83
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	224	$4,623.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	56	$2,146.48
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	2222	$2,933.04
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.46	$17.44
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

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 brush mattresses, live stakes, joint plantings, vegetated geogrids, branch packing, 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, critical area vegetation, live stake, root wads and revetments: 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; 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 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. 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: Square Foot of Streambank/Shoreli

Scenario Unit:: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $44,651.01

Scenario Cost/Unit: $2.23

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 Yard	$2.03	2500	$5,075.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	2500	$9,600.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	16	$1,064.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	75	$12,402.75
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.46	$5.83
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	370	$7,636.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	75	$1,863.75
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	80	$3,066.40
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	2222	$2,933.04

Tree, willow	1426	Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only.	Each	$0.65	1000	$650.00
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.46	$17.44

Practice: 580 - Streambank and Shoreline Protection

Scenario #3 - Structural-Riprap, Block, Gabions

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, root wad 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 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' 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; 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 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: Tons of Rock Riprap Installed

Scenario Unit:: Ton

Scenario Typical Size: 2,750.0

Scenario Total Cost: $139,691.40

Scenario Cost/Unit: $50.80

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.	Hour	$66.50	16	$1,064.00
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.	Acre	$12.67	0.2	$2.53
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 Yard	$4.31	2500	$10,775.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16	$613.28
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1667	$124,924.98
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	667	$880.44
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.2	$7.58
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 580 - Streambank and Shoreline Protection

Scenario #4 - Structural-J Hook, Cross Vane

Scenario Description:

Protection of streambanks using bank stabilization measures to stabilize eroding stream bank, reduce near bank stress and prevent sediment from entering stream along banks of by constructing bankfull benches and using boulders and or log cluster (with boulders) to construct in-stream structures such as J-Hook, Vanes, Cross Vanes or Combo Root Wad/Log Vane and J-Hook structures. 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. Scenario: Install 2 J hooks on 500 ' section of 100 SM watershed channel, where the bankfull depth is 8.0' and the J hook is as high as 1/2 bankfull or 4.0'. Each J hook develops an average pool depth of 8.0'and have a arm length of 130' long with a 53' long (7' deep)hook. Boulders are an average dimension of 3'x 2.5'x 2' and weigh 1,800#s. 225 boulders are required for one structure (125 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: Tons of boulders installed

Scenario Unit:: Ton

Scenario Typical Size: 412.0

Scenario Total Cost: $26,133.66

Scenario Cost/Unit: $63.43

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 Yard	$3.15	260	$819.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	40	$2,254.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	20	$3,307.40
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.1	$1.27
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	60	$1,491.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16	$613.28
Materials						
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	235	$1,036.35
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	484	$638.88
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	412	$14,399.40
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.1	$3.79
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 580 - Streambank and Shoreline Protection

Scenario #12 - Wood Structure

Scenario Description:

Protection of streambanks using bank stabilization measures to stabilize eroding stream bank, reduce near bank stress and prevent sediment from entering stream along banks by constructing bankfull benches and using engineered structures consisting primarily of wood. This includes but not limited to toe wood and engineered log jams. The purpose of this practice is to maintain, improve, and restore physical, chemical, and biological functions of a stream and to provide diverse aquatic communities to improve habitat for desired aquatic species. Typical stream has 50 foot bankfull width and 6 foot banks. Payment costs include installing toe wood, shaping bank, installing live stakes, and installing erosion control fabric. 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: 584 - Channel Bed Stabilization; 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 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, encourages natural sediment transport and deposition, and increases quantity and quality of aquatic habitat. 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. The wood increases habitat availability and diversity.

Feature Measure: Linear Feet

Scenario Unit:: Linear Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $15,622.24

Scenario Cost/Unit: $156.22

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.	Hour	$165.37	30	$4,961.10
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.	Hour	$20.64	30	$619.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	30	$745.50
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	222	$293.04
Tree, willow	1426	Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only.	Each	$0.65	222	$144.30
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	40	$1,398.00
Wattles or facines, 9 to 12 inch diameter	1905	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 9"- 12" diameter. Includes materials and shipping only.	Foot	$11.89	100	$1,189.00
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$231.59	25	$5,789.75
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$9.08	25	$227.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 584 - Channel Bed Stabilization

Scenario #1 - Bio-engineering

Scenario Description:

Stabilize the bottom and slope of a stream channel using bioengineering methods. Bio-engineering methods include live stakes, fascines, plantings, bare root stock, willow waddles, and live stakes. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Planting entire area at a 2x2 grid with live stakes, potted plants, and bare root mix

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Stream cannot be feasibly controlled with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream 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:

Stream channel is stable and vegetated. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. 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: Area of planting

Scenario Unit:: Square Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $9,455.40

Scenario Cost/Unit: $3.78

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.	Hour	$24.91	40	$996.40
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	200	$178.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	120	$2,476.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	40	$840.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	40	$1,533.20
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	800	$1,056.00
Tree, willow	1426	Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only.	Each	$0.65	1500	$975.00
Wattles or facines, 6 to 8 inch diameter	1904	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 6"-8" diameter. Includes materials and shipping only.	Foot	$7.00	200	$1,400.00

Practice: 584 - Channel Bed Stabilization

Scenario #2 - Rock structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using rock riprap or engineered products that consist primarily of rock or concrete. This includes but not limited to gabions, rock veins, rock weirs, concrete blocks,etc. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Based on degrading channel that needs to be riprapped its entire wetted perimeter.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream 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:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. 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: Area to be stabilized.

Scenario Unit:: Cubic Yard

Scenario Typical Size: 575.0

Scenario Total Cost: $45,817.47

Scenario Cost/Unit: $79.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$276.59	0.2	$55.32
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.	Hour	$20.64	20	$412.80
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	600	$44,964.00
Tree, willow	1426	Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only.	Each	$0.65	200	$130.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 584 - Channel Bed Stabilization

Scenario #3 - Wood structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using engineered structures consisting primarily of wood. This includes but not limited to toe wood, log weirs, log vanes, root wads, log step pools, etc. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Structures spaced at 50 foot intervals.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream 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:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. 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: Number of structures

Scenario Unit:: Each

Scenario Typical Size: 3.0

Scenario Total Cost: $8,310.80

Scenario Cost/Unit: $2,770.27

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 Yard	$2.03	40	$81.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	75	$5,620.50
Wattles or facines, 9 to 12 inch diameter	1905	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 9"- 12" diameter. Includes materials and shipping only.	Foot	$11.89	150	$1,783.50

Practice: 584 - Channel Bed Stabilization

Scenario #4 - Structural- J Hook, Cross Vane, etc. requiring boulders

Scenario Description:

Stabilize Channel to prevent degradation and excessive erosion creating excessive sediment and stream water quality degradation by constructing in stream in channel components such as J-Hooks, Vanes, Cross Vanes or Combo Root Wad/Log Vane and J-Hook structures. 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. Scenario: Install 2 J hooks on 500 ' section of 100 SM watershed channel, where the bankfull depth is 8.0' and the J hook is as high as 1/2 bankfull or 4.0'. Each J hook develops an average pool depth of 8.0'and have a arm length of 130' long with a 53' long (7' deep) hook. Boulders are an average dimension of 3'x2.5'x2' and weigh 1,800#s. 225 boulders are required for one structure. Payment does not include cost of channel low bank shaping (assumed this is covered in either vegetative or bioengineered scenario). 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:

The unstable channel is trying to redefine it's normal meander and reduce erosive forces by vertical and laterally moving into a landowners field at an accelerated rate. The stream has severely degraded streambanks that are unstable and show signs of active erosion. Two J hooks (125 CY each) on high velocity stream require boulders to be installed to naturally create a thalweg to dissipate energy and move erosive factors away from the banks, back into the stream and to create natural pools for habitat. Soil Erosion: The stream channel is unstable causing scoring and erosion. 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:

Stream channel is stable. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. 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: <Unknown>

Scenario Unit:: Cubic Yard

Scenario Typical Size: 250.0

Scenario Total Cost: $25,595.30

Scenario Cost/Unit: $102.38

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 Yard	$3.15	260	$819.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	40	$2,254.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	20	$3,307.40
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.	Hour	$20.64	40	$825.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	16	$397.60
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.	Hour	$38.33	60	$2,299.80
Materials						
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	235	$1,036.35
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	412	$14,399.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 585 - Stripcropping

Scenario #1 - 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. The scenario includes 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:: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $127.65

Scenario Cost/Unit: $1.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	3	$65.73
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	3	$61.92

Practice: 587 - Structure for Water Control

Scenario #1 - Inlet Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and 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 the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 42" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x barre

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 2,100.0

Scenario Total Cost: $14,441.96

Scenario Cost/Unit: $6.88

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 Yard	$3.84	190	$729.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	10	$50.70
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.	Hour	$63.09	4	$252.36
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.	Hour	$26.89	6	$161.34
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	6	$123.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Pipe, Steel, 30", Std Wt	1369	Materials: - 30" - Steel Std Wt	Foot	$214.65	50	$10,732.50
Pipe, Steel, 42", Std Wt	1371	Materials: - 42" - Steel Std Wt	Foot	$302.24	6	$1,813.44
Steel, Angle, 2 1/2" x 2 1/2" x 1/4"	1372	Materials: Angle, 2 1/2" x 2 1/2" x 1/4", Meets ASTM A36	Foot	$3.31	24	$79.44
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$11.08	6	$66.48
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	42	$56.70
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 587 - Structure for Water Control

Scenario #2 - Flashboard Riser w/ Single Headwall

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and 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 the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. They can also be fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) and are called in-line structures. This scenario also includes a headwall installed on either the upstream or downstream section of the barrel. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 42" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment (weir (42) x barrel length (50) = 2100) with a headwall.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), Wetland Wildlife Habitat Management (644), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 2,100.0

Scenario Total Cost: $20,442.21

Scenario Cost/Unit: $9.73

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 Yard	$359.17	15	$5,387.55
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	200	$406.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	200	$768.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	10	$50.70
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.	Hour	$63.09	4	$252.36
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.	Hour	$26.89	6	$161.34
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	6	$123.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	4	$118.60
Pipe, Steel, 30", Std Wt	1369	Materials: - 30" - Steel Std Wt	Foot	$214.65	50	$10,732.50
Pipe, Steel, 42", Std Wt	1371	Materials: - 42" - Steel Std Wt	Foot	$302.24	6	$1,813.44
Steel, Angle, 2 1/2" x 2 1/2" x 1/4"	1372	Materials: Angle, 2 1/2" x 2 1/2" x 1/4", Meets ASTM A36	Foot	$3.31	24	$79.44
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$11.08	6	$66.48
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	42	$56.70

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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service **Tennessee**

Practice: 587 - Structure for Water Control

Scenario #3 - Flashboard Riser w/ Double Headwall

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and 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 the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. They can also be fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) and are called in-line structures. This scenario also includes two headwalls, one installed on the upstream and one installed on the downstream section of the barrel. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 42" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment (weir (42) x barrel length (50) = 2100) with two headwalls.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), Wetland Wildlife Habitat Management (644), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 2,100.0

Scenario Total Cost: $27,083.96

Scenario Cost/Unit: $12.90

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 Yard	$359.17	30	$10,775.10
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 Yard	$2.03	400	$812.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	390	$1,497.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	10	$50.70
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.	Hour	$63.09	4	$252.36
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.	Hour	$26.89	6	$161.34
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	6	$123.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	8	$237.20
Pipe, Steel, 30", Std Wt	1369	Materials: - 30" - Steel Std Wt	Foot	$214.65	50	$10,732.50
Pipe, Steel, 42", Std Wt	1371	Materials: - 42" - Steel Std Wt	Foot	$302.24	6	$1,813.44
Steel, Angle, 2 1/2" x 2 1/2" x 1/4"	1372	Materials: Angle, 2 1/2" x 2 1/2" x 1/4", Meets ASTM A36	Foot	$3.31	24	$79.44
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$11.08	6	$66.48
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	42	$56.70

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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 587 - Structure for Water Control

Scenario #4 - Inline Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and 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 the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 1,800.0

Scenario Total Cost: $6,534.10

Scenario Cost/Unit: $3.63

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 Yard	$3.84	190	$729.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	15	$76.05
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.	Hour	$63.09	4	$252.36
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.	Hour	$26.89	7	$188.23
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
Materials						
Pipe, Steel, 30", Std Wt, USED	1361	Materials: - USED - 30" - Steel Std Wt	Foot	$76.61	50	$3,830.50
Pipe, Steel, 36", Std Wt, USED	1362	Materials: - USED - 36" - Steel Std Wt	Foot	$97.81	6	$586.86
Steel, Angle, 2 1/2" x 2 1/2" x 1/4"	1372	Materials: Angle, 2 1/2" x 2 1/2" x 1/4", Meets ASTM A36	Foot	$3.31	24	$79.44
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$11.08	10	$110.80
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.35	36	$48.60
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 587 - Structure for Water Control

Scenario #5 - Commercial Inline Flashboard Riser

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. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). 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 50' of 15" 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: Flashboard Weir Length (in) x Barre

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,266.79

Scenario Cost/Unit: $5.27

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 Yard	$3.84	190	$729.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	15	$76.05
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.	Hour	$63.09	2	$126.18
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	3	$80.67
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Pipe, PVC, 16", SCH 80	1353	Materials: - 16" - PVC - SCH 80 - ASTM D1785	Foot	$39.02	50	$1,951.00
Water Level Control Structure, Inline, 2 Baffle, 8" diameter	2187	Inline Inlet WCS 6' High x 8" Dia.connections , 2 baffle (3 compartments)	Each	$1,762.61	1	$1,762.61
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 587 - Structure for Water Control

Scenario #6 - Culvert <30 inches HDPE

Scenario Description:

Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $2,040.08

Scenario Cost/Unit: $2.13

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 Yard	$2.03	5	$10.15
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	45	$228.15
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.	Hour	$20.64	10	$206.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	2	$149.88
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	5	$150.25
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	1246	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$23.81	40	$952.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	250	$87.50

Practice: 587 - Structure for Water Control

Scenario #7 - Culvert <30 inches CMP

Scenario Description:

Install a new Corrugated Metal Pipe (CMP) culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing instead for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit:: Diameter Inch Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $2,196.88

Scenario Cost/Unit: $2.29

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 Yard	$2.03	5	$10.15
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	45	$228.15
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.	Hour	$20.64	10	$206.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	2	$149.88
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	5	$150.25
Pipe, CMP, 24", 12 Gauge	1417	24" Corrugated Metal Pipe, Galvanized, Uncoated, 12 gage. Material cost only.	Foot	$27.73	40	$1,109.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
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	$0.35	250	$87.50

Practice: 587 - Structure for Water Control

Scenario #8 - Slide Gate

Scenario Description:

This scenario is the installation of a permanent slide gate structure to control the conveyance of water. The typical size is a 4' diameter opening. The slide gate may be installed on an open channel or pipeline. The slide gate is made of steel and has a hand operated mechanical lifting system, i.e. screw. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are: 533-Pumping Plant.

Before Situation:

A channel or pipeline is in need of a head gate to control the flow of water.

After Situation:

A 4' slide gate is installed and operated by hand is installed.

Feature Measure: diameter

Scenario Unit:: Foot

Scenario Typical Size: 4.0

Scenario Total Cost: $8,092.70

Scenario Cost/Unit: $2,023.18

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.	Hour	$56.37	6	$338.22
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	12	$322.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	12	$247.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	6	$149.10
Materials						
Screw gate, cast iron, 4' diameter, 10/0 head	1746	4' diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Includes materials only.	Each	$6,779.67	1	$6,779.67
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 587 - Structure for Water Control

Scenario #9 - Flap Gate

Scenario Description:

This scenario is the installation of a permanent flap (tide) gate structure to control the direction of flow resulting from tides or high water or back-flow from flooding. The typical size is a 1.5' diameter opening. The gate may be installed on an open channel or pipeline. It is made of aluminum and operates automatically. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are:

Before Situation:

A wetland or other area is in need of a flap gate to control the direction of the water.

After Situation:

A flap gate 1.5' wide is installed.

Feature Measure: Feet Diameter (of Gate)

Scenario Unit:: Foot

Scenario Typical Size: 1.0

Scenario Total Cost: $1,784.69

Scenario Cost/Unit: $1,784.69

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.	Hour	$56.37	6	$338.22
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	12	$322.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	12	$247.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	6	$149.10
Materials						
Flap Gate, 24"	2099	24" diameter cast flap gate. Materials only.	Each	$471.66	1	$471.66
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 587 - Structure for Water Control

Scenario #11 - Rock Checks for Water Surface Profile

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped rock structures with points facing upstream for the purpose of raising the water surface profile. Cost estimate is for three check dams with a top width of 3', max height of 6', min height of 3', and 28' length; containing an average of 58 cubic yards or 29 tons of rock for a total of 87 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

After Situation:

Banks are stabilized, and pools are created raising the Water Surface Profile elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580), Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Tons of rock installed

Scenario Unit:: Ton

Scenario Typical Size: 87.0

Scenario Total Cost: $5,057.80

Scenario Cost/Unit: $58.14

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 Yard	$1.59	84	$133.56
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.	Hour	$20.64	8	$165.12
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	57	$4,271.58
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	$487.54	1	$487.54

Practice: 587 - Structure for Water Control

Scenario #13 - In-Stream Structure for Water Surface Profile - Rock

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped rock structure which points facing upstream for the purpose of raising the water surface profile. Cost estimate is for one cross vane with a effective length (Streambed width) of 36', and total length of 75', effective height of 3' (5ft total height) and width of 5 ft. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

After Situation:

Banks are stabilized, and pools are created raising the water surface elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580) Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Tons of Riprap

Scenario Unit:: Ton

Scenario Typical Size: 116.0

Scenario Total Cost: $6,031.96

Scenario Cost/Unit: $52.00

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 Yard	$2.03	28	$56.84
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.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	70	$5,245.80
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	$487.54	1	$487.54

Practice: 587 - Structure for Water Control

Scenario #17 - Flow Meter with Mechanical Index

Scenario Description:

Permanently installed water flow meter with mechanical, cumulative volume and rate index. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. 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 Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit:: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $2,043.26

Scenario Cost/Unit: $204.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with mechanical Index	1450	10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes material, labor and installation.	Each	$1,902.24	1	$1,902.24
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	2	$141.02

Practice: 587 - Structure for Water Control

Scenario #18 - Flow Meter with Electronic Index

Scenario Description:

Permanently installed water flow meter with an electronic index . Meters can be any flow measurement device that meets CPS 433, (i.e., meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes or data logging capability. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch turbine flow meter, with electronic index output. 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 Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waster Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit:: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $3,888.39

Scenario Cost/Unit: $388.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$3,747.37	1	$3,747.37
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	$70.51	2	$141.02

Practice: 587 - Structure for Water Control

Scenario #19 - Flow Meter with Electronic Index & Telemetry

Scenario Description:

Permanently installed water flow meter with an electronic flow rate and volume index and data telemetry transmission system. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch magnetic flow meter, with electronic index output and telemetry data transfer system for monitoring irrigation system flow rate. 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 Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or cell phone at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit:: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $5,401.76

Scenario Cost/Unit: $540.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with electronic Index and telemetry	1451	10 inch Magnetic Irrigation Flow Meter, with electronic index and equipped for telemetry, permanently installed. Includes material, meter appurtenances, and installation.	Each	$5,260.74	1	$5,260.74
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	$70.51	2	$141.02

Practice: 587 - Structure for Water Control

Scenario #276 - Water Bar

Scenario Description:

Construction of a water bar or broad-based dip across an existing passageway to prevent down gradient erosion due to sheet flow or concentrated flow from rill erosion. Typical dimensions of water control structure are 1.5' high, 12' width (4:1 side slopes), and 20' in length across the passageway. Structure also includes a 12' wide x 20' long x 0.5' deep layer of gravel to protect the flow path of water across passageways.

Before Situation:

Extensive erosion is occurring along the passageway causing soil erosion and water quality resource concerns.

After Situation:

Water bars are installed along the slope of the passageway as required to reduce the slope length, reduce the velocity of water, and to prevent sheet and rill erosion from occurring. Installed water bars intercept and divert the water away from the passageway.

Feature Measure: Each

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $630.21

Scenario Cost/Unit: $630.21

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.	Hour	$66.50	2	$133.00
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	1	$24.91
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	4	$120.20
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	27	$33.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $337.71

Scenario Cost/Unit: $8.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	4	$82.56
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.	Hour	$106.41	2	$212.82
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	2	$20.42

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,396.63

Scenario Cost/Unit: $34.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	40	$668.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
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.	Hour	$106.41	4	$425.64
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	2	$20.42
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.54	1	$45.54
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$50.00	1	$50.00

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: $284.29

Scenario Cost/Unit: $284.29

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.	Hour	$20.64	3	$61.92
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.	Hour	$106.41	1	$106.41
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	2	$20.42
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.54	1	$45.54
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$50.00	1	$50.00

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $728.63

Scenario Cost/Unit: $18.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	8	$165.12
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.	Hour	$106.41	4	$425.64
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	2	$20.42
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.54	1	$45.54
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$50.00	1	$50.00

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,012.77

Scenario Cost/Unit: $50.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	2	$56.88
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	$0.17	40	$6.80
Chlorophyll Reader	1125	Applicator and chlorophyll sensor includes labor. No materials	Acre	$11.28	40	$451.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
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.	Hour	$106.41	6	$638.46
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	60	$612.60
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.03	1	$25.03
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	1	$12.86

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: $2,663.20

Scenario Cost/Unit: $2,663.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	$0.17	1	$0.17
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	25	$516.00
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.	Hour	$106.41	15	$1,596.15
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	2	$20.42
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.03	14	$350.42
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	14	$180.04

Practice: 591 - Amendments for the 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: $5,629.44

Scenario Cost/Unit: $35.18

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	$58.56	8	$468.48
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	$645.12	8	$5,160.96

Practice: 595 - Integrated Pest Management (IPM)

Scenario #1 - Basic IPM Field 1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $692.24

Scenario Cost/Unit: $17.31

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.	Hour	$26.89	2	$53.78
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.	Hour	$106.41	6	$638.46

Practice: 595 - Integrated Pest Management (IPM)

Scenario #2 - Basic IPM Field >1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address multiple identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).

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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $931.95

Scenario Cost/Unit: $23.30

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.	Hour	$26.89	3	$80.67
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.	Hour	$106.41	8	$851.28

Practice: 595 - Integrated Pest Management (IPM)

Scenario #3 - Advanced Field All RCs

Scenario Description:

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,384.48

Scenario Cost/Unit: $34.61

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.	Hour	$26.89	4	$107.56
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.	Hour	$106.41	12	$1,276.92

Practice: 595 - Integrated Pest Management (IPM)

Scenario #4 - Basic IPM Fruit/Veg 1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $958.84

Scenario Cost/Unit: $95.88

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.	Hour	$26.89	4	$107.56
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.	Hour	$106.41	8	$851.28

Practice: 595 - Integrated Pest Management (IPM)

Scenario #5 - Basic IPM Fruit/Veg >1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,225.44

Scenario Cost/Unit: $122.54

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.	Hour	$26.89	6	$161.34
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.	Hour	$106.41	10	$1,064.10

Practice: 595 - Integrated Pest Management (IPM)

Scenario #6 - Advanced IPM Fruit/Veg All RCs

Scenario Description:

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,865.05

Scenario Cost/Unit: $186.51

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.	Hour	$26.89	10	$268.90
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.	Hour	$106.41	15	$1,596.15

Practice: 595 - Integrated Pest Management (IPM)

Scenario #7 - Basic IPM Orchard 1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,225.44

Scenario Cost/Unit: $122.54

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.	Hour	$26.89	6	$161.34
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.	Hour	$106.41	10	$1,064.10

Practice: 595 - Integrated Pest Management (IPM)

Scenario #8 - Basic IPM Orchard >1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,865.05

Scenario Cost/Unit: $186.51

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.	Hour	$26.89	10	$268.90
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.	Hour	$106.41	15	$1,596.15

Practice: 595 - Integrated Pest Management (IPM)

Scenario #9 - Advanced IPM Orchard All RCs

Scenario Description:

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

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).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,800.45

Scenario Cost/Unit: $280.05

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.	Hour	$26.89	25	$672.25
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.	Hour	$106.41	20	$2,128.20

Practice: 595 - Integrated Pest Management (IPM)

Scenario #10 - IPM S-Farm 1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, organic, etc.) to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems.

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).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Small farm treated with IPM

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $585.83

Scenario Cost/Unit: $585.83

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.	Hour	$26.89	2	$53.78
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.	Hour	$106.41	5	$532.05

Practice: 595 - Integrated Pest Management (IPM)

Scenario #11 - IPM S-Farm >1RC

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/ Diversified Systems (e.g. CSA, organic, etc.) to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems.

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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Small farm treated with IPM

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $746.02

Scenario Cost/Unit: $746.02

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.	Hour	$26.89	4	$107.56
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.	Hour	$106.41	6	$638.46

Practice: 595 - Integrated Pest Management (IPM)

Scenario #12 - Advanced IPM S-Farm All RCs

Scenario Description:

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, Organic, etc.) to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings. This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems.

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).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Feature Measure: Small farm treated with IPM

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,119.03

Scenario Cost/Unit: $1,119.03

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.	Hour	$26.89	6	$161.34
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.	Hour	$106.41	9	$957.69

Practice: 595 - Integrated Pest Management (IPM)

Scenario #13 - Risk Prevention IPM All RCs

Scenario Description:

A comprehensive IPM plan based primarily on LGU-approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. LGU-approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns. This type of system is very difficult to achieve, but may be most commonly achieved in Organic Systems that already rely heavily on prevention and avoidance techniques.

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).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan based primarily on Land Grant University approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. Land Grant University approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns.

Feature Measure: Acres treated with IPM

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,467.45

Scenario Cost/Unit: $146.75

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.	Hour	$26.89	15	$403.35
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.	Hour	$106.41	10	$1,064.10

Practice: 600 - Terrace

Scenario #1 - Broadbased

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. The typical installation is a broadbased terrace having 5:1 upstream and 5:1 downstream slopes measuring 2,500 feet in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. 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 Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit:: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $5,570.71

Scenario Cost/Unit: $2.23

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.	Hour	$124.72	34	$4,240.48
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	34	$844.90
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.	Hour	$38.33	6	$229.98
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 600 - Terrace

Scenario #2 - Flat Channel

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. The typical installation is a flat channel (level) terrace storing runoff with a length of 2,500 feet and side slopes of 8:1 or greater in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. 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 flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet height, and 2,500 feet in length 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 Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit:: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $9,087.48

Scenario Cost/Unit: $3.63

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.	Hour	$124.72	57	$7,109.04
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	57	$1,416.45
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 600 - Terrace

Scenario #3 - Grass Backed

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. The typical installation is a system of terraces (2,500 feet in length) that have one relatively flat (5:1) slope and one steep (2:1) slope constructed in a field with slopes from 2% to 8% installed in loam soils or similar soils in regards to workability. The steep slope is established to permanent vegetation with the flatter slope farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Vegetation of one slope is included. 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 with one steep (2:1) and one flat (5:1) slope measuring 2,500 feet in length and 2.5' height 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. Associated practices are Grassed Waterway (412) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit:: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $3,696.95

Scenario Cost/Unit: $1.48

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.	Hour	$124.72	19	$2,369.68
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hour	$44.96	1	$44.96
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	19	$472.15
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	3	$114.99
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	$0.57	40	$22.80
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	$0.48	50	$24.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	50	$18.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1.5	$49.14
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	2	$261.00
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	1	$52.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 600 - Terrace

Scenario #4 - Narrow Base, less than 8% slope

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. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes from 3% to 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Vegetation is included for both slopes. 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 narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5 feet height is constructed 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. Associated practices are Grassed Waterway (412) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit:: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $4,444.80

Scenario Cost/Unit: $1.78

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.	Hour	$124.72	24	$2,993.28
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hour	$44.96	1	$44.96
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	3	$114.99
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	$0.57	40	$22.80
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	$0.48	50	$24.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	50	$18.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1.5	$49.14
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	2	$261.00
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	1	$52.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 600 - Terrace

Scenario #5 - Narrow Base, greater than 8% slope

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. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes exceeding 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Vegetation is included. 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 narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5' height is constructed 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. Associated practices are Grassed Waterway (412) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit:: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $4,782.27

Scenario Cost/Unit: $1.91

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.	Hour	$124.72	26	$3,242.72
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hour	$44.96	1	$44.96
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	26	$646.10
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.	Hour	$38.33	4	$153.32
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	$0.57	40	$22.80
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	$0.48	50	$24.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	50	$18.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1.5	$49.14
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	2	$261.00
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	1	$52.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 606 - Subsurface Drain

Scenario #1 - Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 Inches

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. 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 number of mainline connections for 2,000 feet of subsurface drain line is a total of 3 each. 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.

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.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $7,031.12

Scenario Cost/Unit: $3.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, tile line plowing, earth, 60"	1457	Plowing in 3"-15" CPP drain line into earth, 60" depth, includes equipment and labor for trenching, laying, and backfilling.	Foot	$2.40	2000	$4,800.00
Materials						
Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$1.40	1000	$1,400.00
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	$29.41	3	$88.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 606 - Subsurface Drain

Scenario #2 - Enveloped Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 Inches

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline with Sand-Gravel envelope, using a drainage trencher. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 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. The typical number of mainline connections for 2,000 feet of subsurface drain line is a total of 3 each. 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.

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.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $10,062.32

Scenario Cost/Unit: $5.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hour	$88.65	8	$709.20
Trenching, Earth, 12" x 60"	1459	Trenching, earth, 12" wide x 60" depth, includes equipment and labor for trenching, laying 3"-6" CPP drain line with envelope, and backfilling.	Foot	$1.94	2000	$3,880.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	64	$1,923.20
Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$1.40	1000	$1,400.00
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	$29.41	3	$88.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54
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	$0.35	3200	$1,120.00

Practice: 606 - Subsurface Drain

Scenario #3 - Corrugated Plastic Pipe (CPP), Single-Wall, > 6 Inches

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 10-inch. Construct 1,000 feet of 10-inch, Single-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 1,000 feet of 10-inch, Single-Wall, HDPE CPP weighs 1.80 lb/ft, or a total of 1,800 pounds. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

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.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,895.08

Scenario Cost/Unit: $5.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, tile line plowing, earth, 60"	1457	Plowing in 3"-15" CPP drain line into earth, 60" depth, includes equipment and labor for trenching, laying, and backfilling.	Foot	$2.40	1000	$2,400.00
Materials						
Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$1.40	1800	$2,520.00
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	$487.54	2	$975.08

Practice: 606 - Subsurface Drain

Scenario #4 - Corrugated Plastic Pipe (CPP), Twin-Wall, > 6 Inches

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Twin-Wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 8-inch to 15-inch; and typical scenario size is 12-inch. Construct 1,000 feet of 12-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 1,000 feet of 12-inch, Twin-Wall, HDPE CPP weighs 3.20 lb/ft, or a total of 3,200 pounds. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

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.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $13,695.66

Scenario Cost/Unit: $13.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 24" x 60"	1460	Trenching, earth, 24" wide x 60" depth, includes equipment and labor for trenching and backfilling.	Foot	$3.80	1000	$3,800.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	64	$1,320.96
Materials						
Pipe, HDPE, corrugated double wall, LTE-12", soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12" diameter. Materials only.	Pound	$2.52	3200	$8,064.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 612 - Tree/Shrub Establishment

Scenario #1 - Plug Conifers, hand plant

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs under planting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:

The prescribed number of trees are hand planted on 40 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $6,053.46

Scenario Cost/Unit: $151.34

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.	Hour	$20.64	120	$2,476.80
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.	Hour	$38.33	2	$76.66
Materials						
Tree, conifer, seedling, containerized, 4 cu. in.	1516	Containerized conifer stock, 4 cubic inches (e.g., "4a" plug), 1.1" x 5.2". Includes materials and shipping only.	Each	$0.25	14000	$3,500.00

Practice: 612 - Tree/Shrub Establishment

Scenario #2 - Bare root conifers, hand plant

Scenario Description:

This practice involves planting of tree seedlings 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. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted.

Before Situation:

The land has a little/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 lose 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:

40 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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,220.66

Scenario Cost/Unit: $80.52

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.	Hour	$20.64	100	$2,064.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Tree, conifer, seedling, bare root, 1-0	1512	Bare root conifer trees, 1-0 (1 year old). Includes materials and shipping only.	Each	$0.06	18000	$1,080.00

Practice: 612 - Tree/Shrub Establishment

Scenario #3 - Bare Root Conifers, machine plant

Scenario Description:

This practice involves planting of tree seedlings 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. Terrain is moderately sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

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 lose 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:

40 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. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,070.27

Scenario Cost/Unit: $76.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	18	$448.38
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	18	$126.18
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.	Hour	$20.64	24	$495.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	20	$420.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Tree, conifer, seedling, bare root, 1-0	1512	Bare root conifer trees, 1-0 (1 year old). Includes materials and shipping only.	Each	$0.06	18000	$1,080.00
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	$171.75	1	$171.75

Practice: 612 - Tree/Shrub Establishment

Scenario #4 - Hand plant bare root hardwoods, no tubes

Scenario Description:

Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation:

In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.

After Situation:

The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Post planting vegetation control is planned to ensure seedling survival.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,342.26

Scenario Cost/Unit: $234.23

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.	Hour	$20.64	40	$825.60
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.	Hour	$38.33	2	$76.66
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	4500	$1,440.00

Practice: 612 - Tree/Shrub Establishment

Scenario #5 - Bare Root Hardwood, machine plant, no tubes, 300

Scenario Description:

This practice involves planting of tree seedlings 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. Terrain is moderately sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

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 lose 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:

10 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. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,076.55

Scenario Cost/Unit: $207.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	6	$149.46
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	6	$42.06
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.	Hour	$20.64	12	$247.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	6	$126.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	3000	$960.00
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 i	Dollar	$1.02	50	$51.00
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	$171.75	1	$171.75

Practice: 612 - Tree/Shrub Establishment

Scenario #6 - Bare Root Hardwood with Tubes, 150

Scenario Description:

Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation:

In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.

After Situation:

The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from animal browsing damage. Post planting vegetation control is planned to ensure seedling survival.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,080.68

Scenario Cost/Unit: $708.07

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.	Hour	$12.36	24	$296.64
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.	Hour	$20.64	48	$990.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	1500	$480.00
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	1500	$3,225.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Stakes, wood, 3/4" x 3/4" x 48"	1582	3/4" x 3/4" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$1.19	1500	$1,785.00

Practice: 612 - Tree/Shrub Establishment

Scenario #9 - Plant Containerized Stock (per plant), conifer

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs under planting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit:: Each

Scenario Typical Size: 6,000.0

Scenario Total Cost: $4,804.52

Scenario Cost/Unit: $0.80

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.	Hour	$20.64	80	$1,651.20
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.	Hour	$38.33	4	$153.32
Materials						
Tree, conifer, seedling, containerized, 8 cu. in.	1518	Containerized conifer stock, 8 cubic inches (e.g. 1.5" x 6"). Includes materials and shipping only.	Each	$0.50	6000	$3,000.00

Practice: 612 - Tree/Shrub Establishment

Scenario #10 - Hand Plant Containerized with Protection from Wildlife (per plant), w tubes

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs under planting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

After Situation:

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Feature Measure: Each Planted Seedling

Scenario Unit:: Each

Scenario Typical Size: 6,000.0

Scenario Total Cost: $20,593.98

Scenario Cost/Unit: $3.43

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.	Hour	$20.64	100	$2,064.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	6	$229.98
Materials						
Tree, conifer, seedling, containerized, 8 cu. in.	1518	Containerized conifer stock, 8 cubic inches (e.g. 1.5" x 6"). Includes materials and shipping only.	Each	$0.50	6000	$3,000.00
Tree shelter, solid tube type, 3-1/4" x 30"	1560	3-1/4" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.82	6000	$10,920.00
Stakes, wood, 3/4" x 3/4" x 36"	1581	3/4" x 3/4" x 36" wood stakes to fasten items in place. Includes materials only.	Each	$0.73	6000	$4,380.00

Practice: 612 - Tree/Shrub Establishment

Scenario #15 - BRHdwds, machine plant, dense, no tube

Scenario Description:

This practice involves planting tree seedlings after the site has been prepared for seed lining growth and establishment. The productivity of the site is good and will handle a medium density planting rate (680 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,835.79

Scenario Cost/Unit: $383.58

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.	Hour	$24.91	12	$298.92
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	12	$84.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	24	$495.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	12	$252.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	6800	$2,176.00
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 i	Dollar	$1.02	50	$51.00
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	$171.75	1	$171.75

Practice: 612 - Tree/Shrub Establishment

Scenario #16 - BRHdwds w tubes, 110 per acre

Scenario Description:

This practice involves planting tree seedlings after the site has been prepared for seed lining growth and establishment. The productivity of the site is good and will handle a low density planting rate (110 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,598.56

Scenario Cost/Unit: $559.86

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.	Hour	$12.36	16	$197.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
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.	Hour	$38.33	4	$153.32
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	1100	$352.00
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	1100	$2,365.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	2200	$110.00
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	1100	$1,760.00

Practice: 612 - Tree/Shrub Establishment

Scenario #17 - BRHdwds w tubes, 300 per acre

Scenario Description:

This practice involves planting tree seedlings after the site has been prepared for seed lining growth and establishment. The productivity of the site is good and will handle a low-medium density planting rate (300 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $15,391.36

Scenario Cost/Unit: $1,539.14

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.	Hour	$12.36	48	$593.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	96	$1,981.44
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.	Hour	$38.33	8	$306.64
Materials						
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	3000	$960.00
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	$2.15	3000	$6,450.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	6000	$300.00
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	$1.60	3000	$4,800.00

Practice: 612 - Tree/Shrub Establishment

Scenario #51 - Tree/shrub Planted Area with Protection

Scenario Description:

Tree seedlings will be hand planted in a forested area where few or no forest trees are currently growing. When implemented with the guidance of a professional forester, a well-stocked stand of a predetermined species composition will result. Standard forestry measures are used to provide temporary protection for planted trees, to improve the likelihood of successful establishment and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate wildlife & fish habitat; and/or Water Quality Degradation - Excessive sediment in surface waters.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to natural forest regeneration and establishment, and tree planting along with temporary protection will be needed. Primary resource concerns are Degraded Plant Condition - Inadequate structure and composition and Inadequate wildlife & fish habitat.

After Situation:

Trees have been successfully established on 20 acres of forest land. The regrowing forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon.

Feature Measure: area

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $12,960.62

Scenario Cost/Unit: $648.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	30	$657.30
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.	Hour	$7.30	30	$219.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	60	$1,238.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	30	$1,149.90
Materials						
Wire, Woven, Wildlife, 96"	6	High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only.	Each	$463.83	12	$5,565.96
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	$27.48	30	$824.40
Post, Steel T, 1.33 lbs, 10'	17	Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only.	Each	$11.13	30	$333.90
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.12	3750	$450.00
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". Includes materials and shipping only.	Each	$1.55	38	$58.90
Gate, Game, 8' High X 4'	1082	4' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	$205.99	1	$205.99
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	$0.32	6000	$1,920.00
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	$171.75	1	$171.75

Practice: 612 - Tree/Shrub Establishment

Scenario #52 - Tree/Shrub Regeneration Area with Protection

Scenario Description:

Naturally regenerate a forest stand using properly timed even-aged over story harvesting methods and necessary site preparation. When implemented with the guidance of a professional forester, such silvicultural activities result in well stocked stands representative of the natural community. Standard forestry measures are used to provide temporary protection for regenerating trees, to improve the likelihood of successful regeneration and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Clearing of brush and undesirable trees is not necessary. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate wildlife & fish habitat; and/or Water Quality Degradation - Excessive sediment in surface waters.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to natural forest regeneration and establishment, and temporary protection will be needed. Primary resource concerns are Degraded Plant Condition - Inadequate structure and composition and Inadequate wildlife & fish habitat.

After Situation:

Natural forest regeneration has been accomplished on 20 acres of forest land. Trees are successfully established and the forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon.

Feature Measure: Area of Treatment

Scenario Unit:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $7,951.30

Scenario Cost/Unit: $397.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Materials						
Wire, Woven, Wildlife, 96"	6	High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only.	Each	$463.83	12	$5,565.96
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	$27.48	30	$824.40
Post, Steel T, 1.33 lbs, 10'	17	Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only.	Each	$11.13	30	$333.90
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.12	3750	$450.00
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". Includes materials and shipping only.	Each	$1.55	38	$58.90
Gate, Game, 8' High X 4'	1082	4' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	$205.99	1	$205.99
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	$171.75	1	$171.75

Practice: 614 - Watering Facility

Scenario #1 - Converted heavy equipment tire trough

Scenario Description:

An 8 ft. diameter heavy equipment tire trough (HETT) is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The HETT is placed on a concrete pad that extends 1.0' beyond the trough on all sides. The concrete pad is underlain by gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,750.91

Scenario Cost/Unit: $1,750.91

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 Yard	$230.94	1.5	$346.41
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	2	$112.74
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	1.25	$37.56
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	$0.57	1.6	$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	$0.48	2	$0.96
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	2	$0.72
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.06	$1.97
Tank, Tire, 8' diameter	286	Tire, includes material cost for tank and shipping. Labor and other appurtenance costs not included.	Each	$743.81	1	$743.81
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.08	$10.44
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.04	$1.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 614 - Watering Facility

Scenario #2 - 2-hole freeze-proof watering trough

Scenario Description:

A permanent, 2-hole freeze-proof watering trough is installed per manufacturer's requirements to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.5’ beyond the trough on all sides (5’x7’x5”). The concrete pad is underlain by 4” of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water.

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Feature Measure: Each watering facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,470.68

Scenario Cost/Unit: $1,470.68

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 Yard	$230.94	0.6	$138.56
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	2	$112.74
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.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	0.5	$15.03
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	$0.57	1.48	$0.84
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	$0.48	1.85	$0.89
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	1.85	$0.67
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.06	$1.97
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	$712.37	1	$712.37
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	4	$5.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.07	$9.14
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.04	$1.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 614 - Watering Facility

Scenario #3 - 4-hole freeze-proof watering trough

Scenario Description:

A permanent, 4-hole freeze-proof watering trough is installed per manufacturer's requirements to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.5' beyond the trough on all sides (7'x7'x5"). The concrete pad is underlain by 4" of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water.

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Feature Measure: Each watering facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,874.22

Scenario Cost/Unit: $1,874.22

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 Yard	$359.17	0.8	$287.34
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	2.5	$140.93
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2.5	$62.13
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	$0.57	1.5	$0.86
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	$0.48	1.9	$0.91
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	1.9	$0.68
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.06	$1.97
Tank, Freeze Proof, 4 hole	281	Tank, Freeze Proof with 4 drinking holes. Includes materials and shipping.	Each	$939.00	1	$939.00
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	6	$7.50
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.07	$9.14
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.04	$1.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service **Tennessee**

Practice: 614 - Watering Facility

Scenario #4 - Tank, 100 to 500 gallons

Scenario Description:

A 300-gallon polyethylene watering trough (5' diameter) is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.0' beyond the trough on all sides (7'x7'x5"). The concrete pad is underlain by 4" of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Feature Measure: Each watering facility

Scenario Unit:: Gallon

Scenario Typical Size: 300.0

Scenario Total Cost: $1,158.39

Scenario Cost/Unit: $3.86

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 Yard	$359.17	0.6	$215.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	2.5	$140.93
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2.5	$62.13
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	0.5	$15.03
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	$0.57	1.5	$0.86
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	$0.48	1.9	$0.91
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	1.9	$0.68
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.6	$19.66
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	6	$7.50
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.07	$9.14
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.04	$1.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service **Tennessee**

Practice: 614 - Watering Facility

Scenario #5 - Tank, 500 to 1000 gallons

Scenario Description:

A 500-gallon (6 ft. diameter) concrete tank watering trough is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a 5”-thick concrete pad that extends 1.0’ beyond the trough on all sides. The concrete pad is underlain by gravel (4”) and geotextile. The practice includes vegetation of all areas disturbed by construction. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment ((Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit:: Gallon

Scenario Typical Size: 500.0

Scenario Total Cost: $1,903.29

Scenario Cost/Unit: $3.81

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 Yard	$230.94	1	$230.94
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	2.5	$140.93
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2.5	$62.13
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	1	$30.05
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	$0.57	1.6	$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	$0.48	2	$0.96
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	2	$0.72
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.06	$1.97
Tank, Concrete, 500 gallon	1049	Concrete tank for water storage, with riser and lid. Includes materials and delivery	Each	$974.29	1	$974.29
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	8	$10.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.08	$10.44
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.4	$17.98
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 614 - Watering Facility

Scenario #6 - Tank, 1000 to 1500 gallons

Scenario Description:

A 1,000-1,500 gallon steel tank (10' dia.) with bottom liner watering trough is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a 5”-thick concrete pad that extends 1.0’ beyond the trough on all sides. The concrete pad is underlain by gravel (4”) and geotextile. Vegetation of disturbed areas is included in practice installation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit:: Gallon

Scenario Typical Size: 1,200.0

Scenario Total Cost: $1,264.89

Scenario Cost/Unit: $1.05

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 Yard	$230.94	2.2	$508.07
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	3	$169.11
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	3	$74.55
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	1.8	$54.09
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	$0.57	1.6	$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	$0.48	2	$0.96
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	2	$0.72
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.06	$1.97
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	$0.29	1	$0.29
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	16	$20.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.08	$10.44
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.04	$1.80
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 614 - Watering Facility

Scenario #7 - Tank, greater than 1500 gallons

Scenario Description:

A >1,500 gallon steel with bottom liner watering trough constructed of approved materials, installed to provide water for livestock on a 14' x 14' x5" concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion 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. 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:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,338.88

Scenario Cost/Unit: $2,338.88

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 Yard	$230.94	3	$692.82
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	3	$169.11
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	3	$74.55
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	2.4	$72.12
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	$0.57	1.6	$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	$0.48	2	$0.96
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	2	$0.72
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.06	$1.97
Tank, Galvanized Steel Bottomless w/liner Livestock, <= 6,000 gallon	1071	Includes tank materials, shipping, and float valve, no liner	Gallon	$0.54	1600	$864.00
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	22	$27.50
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.08	$10.44
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.04	$1.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.04	$1.80
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 614 - Watering Facility

Scenario #8 - Portable Trough, less than 100 gallons

Scenario Description:

This scenario is used for a pasture rotation, Prescribed Grazing (528), or enhanced pasture management utilization, by installing a small water trough (100 gallon) for water supply. The trough is moved from paddock to paddock as outlined in the plan. Because the system does not flow continuously a float is needed to maintain the water level within the portable trough. A typical system will have six paddocks using a single trough.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation:

A portable heavy duty polyethylene trough is installed as part of an intensive rotational grazing management system. The trough is connected to a water supply system via quick coupler. The trough is secured to wooden posts next to the hydrant and protected by wooden boards attached to the posts. The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561). Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (Code 561) as appropriate.

Feature Measure: Number of Portable Troughs install

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $122.70

Scenario Cost/Unit: $122.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Tank, Polyethylene, 100 gallon	290	Portable heavy duty rubber stock tank.	Each	$98.09	1	$98.09
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$24.61	1	$24.61

Practice: 614 - Watering Facility

Scenario #9 - Water Ramp, Rock on Geotextile

Scenario Description:

A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock and/or gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation:

Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation:

A permanent watering facility-water ramp is constructed of 640 square feet of rock and/or gravel surfacing on 84 square yards of geotextile fabric foundation. (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Feature Measure: Area of Ramp

Scenario Unit:: Square Foot

Scenario Typical Size: 640.0

Scenario Total Cost: $1,129.92

Scenario Cost/Unit: $1.77

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 Yard	$2.03	24	$48.72
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	12	$10.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20
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	$0.57	0.4	$0.23
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	$0.48	0.5	$0.24
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	0.5	$0.18
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.02	$0.66
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	12	$248.64
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	84	$370.44
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.02	$2.61
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.01	$0.38
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.01	$0.45
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	$171.75	2	$343.50

Practice: 614 - Watering Facility

Scenario #11 - Water Ramp, Rock Riprap and gravel on Geotextile

Scenario Description:

A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock riprap and gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation:

Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation:

A permanent watering ramp is constructed of 640 square feet of rock riprap (8 inches deep) and gravel surfacing (2 inches deep) on 84 square yards of geotextile fabric foundation. (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Feature Measure: Area of Ramp

Scenario Unit:: Square Foot

Scenario Typical Size: 640.0

Scenario Total Cost: $4,535.59

Scenario Cost/Unit: $7.09

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.	Hour	$56.37	16	$901.92
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	8	$997.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	20	$17.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	16	$1,199.04
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	4	$120.20
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	$0.57	0.4	$0.23
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	$0.48	0.5	$0.24
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	0.5	$0.18
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.02	$0.66
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.02	$2.61
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.01	$0.38
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	$44.94	0.01	$0.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 614 - Watering Facility

Scenario #18 - Underground storage reservoir

Scenario Description:

A 1,700 gallon plastic storage tank (6'x12'x6' high) is installed underground to provide water to be gravity fed to down-slope watering troughs and/or tanks for livestock. Site excavated in rocky soil to install storage tank on a 6'x12'x6" gravel pad foundation. Gravel installed on top of a non-woven geotextile to provide a stable base for the tank and also on the ground adjacent to the overflow to prevent erosion; gravel also installed on the sides and ends of the tank up to the top. Approximately 18" of topsoil placed on top to protect the tank and prevent freezing. 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. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, improve grazing distribution and plant and livestock productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering pollutants directly to the receiving water; grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water; these conditions cause soil erosion and degrade surface water quality.

After Situation:

A plastic storage tank is installed to provide water for livestock via down-slope watering troughs and/or tanks. The down-slope watering facilities improve animal grazing distribution and nutrient cycling. The underground storage tank is installed on a 6'x12'x 6” gravel bed that sits on top of a non-woven geotextile. Associated practices: 516 Livestock Pipeline (buried pipe for getting water to and out of the 614 storage tank; and also freeze-proof hydrants); and 614 scenarios for watering facilities where livestock access/drink; 561 HUAP; 620 Underground Outlet (to safely discharge overflow water); any needed water source installation will use Water Well (642), Pumping Plant (533), or Spring Development (574) as appropriate.

Feature Measure: Each watering facility

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,080.45

Scenario Cost/Unit: $3,080.45

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.	Hour	$56.37	4.5	$253.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2.5	$54.78
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	2	$116.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	4	$82.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	6.5	$136.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	5.7	$171.29
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	$0.57	25	$14.25
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	$0.48	25	$12.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	25	$9.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	0.13	$4.26
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.97	1700	$1,649.00
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$24.61	1	$24.61
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.41	8	$35.28
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	0.05	$6.53
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service

Tennessee

Practice: 620 - Underground Outlet

Scenario #1 - Pipe, no inlet, 6 inch or less

Scenario Description:

Install 280 feet of 6" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 6" HDPE pipe, trench excavation, trench backfill, 20' of 6" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

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:

"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), Diversion (342), Roof Runoff Management (558) and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including outlet

Scenario Unit:: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $1,457.78

Scenario Cost/Unit: $4.86

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 Yard	$2.50	82	$205.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	82	$137.76
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	20	$126.40
Pipe, HDPE, 6", CPT, Single Wall	1242	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	$1.15	280	$322.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service

Tennessee

Practice: 620 - Underground Outlet

Scenario #2 - Pipe, no inlet, greater than 6 inches and 12 inches or less

Scenario Description:

Install 280 feet of 12" approved plastic pipe to convey storm-water from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 12" HDPE pipe, trench excavation, trench backfill, 20' of 12" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

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:

"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), Diversion (342), Roof Runoff Management (558) and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including outlet

Scenario Unit:: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $2,796.58

Scenario Cost/Unit: $9.32

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 Yard	$2.50	82	$205.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	82	$137.76
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Pipe, PVC, 12", SDR 35	1252	Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only.	Foot	$18.66	20	$373.20
Pipe, HDPE, 12", PCPT, Single Wall	1274	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12" diameter - ASTM F667. Material cost only.	Foot	$5.05	280	$1,414.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #3 - Pipe, no inlet, greater than 12 inch

Scenario Description:

Install 300 feet of 18" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 18" HDPE pipe, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet (outlet pipe not separate since component is double wall pipe). This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

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:

"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), Diversion (342), Roof Runoff Management (558) and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including outlet

Scenario Unit:: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $4,948.38

Scenario Cost/Unit: $16.49

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 Yard	$2.50	82	$205.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	82	$137.76
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18"	1245	Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$13.13	300	$3,939.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #4 - Pipe, riser, 6 inch or less

Scenario Description:

Install 480 feet of 6" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench is excavated approximately 54" deep and 15" wide by hydraulic excavator. Costs include 6" HDPE corrugated single wall plastic tubing, 8" Perforated PVC Riser Inlet, trench excavation, trench backfill, 20' of 6" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including outlet

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $2,598.32

Scenario Cost/Unit: $5.20

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.	Hour	$63.09	10	$630.90
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.50	105	$262.50
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 Yard	$2.16	2	$4.32
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
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.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	20	$126.40
Pipe, HDPE, 6", CPT, Single Wall	1242	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	$1.15	480	$552.00
Inlet, riser, 8"	1262	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8" diameter. Materials only.	Each	$111.40	1	$111.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #5 - Pipe, riser, > 6 inches and <= 12 inches

Scenario Description:

Install 480 feet of 10" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, 12" Perforated PVC Riser Inlet, trench excavation, trench backfill, 20' of 10" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including outlet

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $4,823.32

Scenario Cost/Unit: $9.65

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.	Hour	$63.09	10	$630.90
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.50	210	$525.00
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 Yard	$2.16	2	$4.32
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
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.	Hour	$38.33	4	$153.32
Materials						
Pipe, PVC, 10", SDR 35	1251	Pipe, PVC, SDR 35, 10" Diameter - ASTM D3034. Material cost only.	Foot	$13.05	20	$261.00
Inlet, riser, 12"	1264	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12" diameter. Materials only.	Each	$550.38	1	$550.38
Pipe, HDPE, 10", PCPT, Single Wall	1273	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10" diameter - ASTM F667. Material cost only.	Foot	$4.04	480	$1,939.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #6 - Pipe, riser, greater than 12 inch

Scenario Description:

Install 500 feet of 18" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench Excavation is 64" deep and 32" wide. Costs include 18" HDPE pipe, an additional 6' of 18" HDPE to serve as a Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including outlet

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $9,436.86

Scenario Cost/Unit: $18.87

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.	Hour	$114.38	10	$1,143.80
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.50	263	$657.50
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 Yard	$2.16	2	$4.32
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	10	$248.50
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.	Hour	$38.33	4	$153.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18"	1245	Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$13.13	506	$6,643.78
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #7 - Pipe, drop inlet, 6 inch or less

Scenario Description:

Install 500 feet of 6" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench is excavated 54" deep and 24" wide by hydraulic track excavator. Costs include 6" Sch 40 PVC pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $5,140.32

Scenario Cost/Unit: $10.28

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 Yard	$2.50	170	$425.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	170	$285.60
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	500	$3,160.00
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$603.10	1	$603.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #8 - Pipe, drop inlet, > 6 inches and <= 12 inches

Scenario Description:

Install 500 feet of 12" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 12" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $5,629.24

Scenario Cost/Unit: $11.26

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 Yard	$2.50	210	$525.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	210	$352.80
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 12"	1244	Pipe, Corrugated HDPE Double Wall, 12" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$6.96	500	$3,480.00
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$603.10	1	$603.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service

Tennessee

Practice: 620 - Underground Outlet

Scenario #9 - Pipe, drop inlet, 18 inch or less

Scenario Description:

Install 500 feet of 18" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench excavation is 66" deep x 39" wide. Costs include 18" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often is 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $11,093.78

Scenario Cost/Unit: $22.19

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 Yard	$2.50	330	$825.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	330	$554.40
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	60	$1,803.00
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18"	1245	Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$13.13	500	$6,565.00
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$603.10	1	$603.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #10 - Pipe, drop inlet, 24 inch or less

Scenario Description:

Install 500 feet of 24" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench excavation is 72" x 48" wide. Costs include 24" HDPE pipe, Precast concrete drop inlet with steel grate, 24" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $17,665.73

Scenario Cost/Unit: $35.33

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 Yard	$2.50	445	$1,112.50
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	445	$747.60
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	85	$2,554.25
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	1246	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$23.81	500	$11,905.00
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$603.10	1	$603.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #11 - Pipe, drop inlet, 30 inch or less

Scenario Description:

Install 500 feet of 30" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench excavation is 78" deep x 56" wide. Costs include 30" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $22,408.17

Scenario Cost/Unit: $44.82

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 Yard	$2.50	565	$1,412.50
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	565	$949.20
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	105	$3,155.25
Pipe, HDPE, CPT, Double Wall, Soil Tight, 30"	1247	Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$30.71	500	$15,355.00
Catch Basin, concrete, 3'x3'x6'	1258	Catch Basin, Precast Concrete, 3' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$792.94	1	$792.94
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 620 - Underground Outlet

Scenario #12 - Pipe, drop inlet, greater than 30 inch

Scenario Description:

Install 500 feet of 36" approved plastic pipe to convey storm water from one location to a suitable and stable outlet. Trench excavation is 84" deep x 64" wide. Costs include 36" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. 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. 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:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $28,222.17

Scenario Cost/Unit: $56.44

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 Yard	$2.50	690	$1,725.00
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.68	690	$1,159.20
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 Yard	$2.16	2	$4.32
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	$74.94	1	$74.94
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	135	$4,056.75
Pipe, HDPE, CPT, Double Wall, Soil Tight, 36"	1248	Pipe, Corrugated HDPE Double Wall, 36" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$39.49	500	$19,745.00
Catch Basin, concrete, 3'x3'x6'	1258	Catch Basin, Precast Concrete, 3' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$792.94	1	$792.94
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 629 - Waste Treatment

Scenario #1 - Litter Windrow Pasteurization

Scenario Description:

This practice scenario includes the in house windrowing of poultry litter to promote pasteurization between flocks. 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). 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:

This scenario assumes 4 flocks per year in an operation with 2 - 42 x 500 square foot houses. Three (3) in-house pasteurization events will be performed annually. There will be a full cleanout after the 4th flock. Formula to calculate the total number of pasteurization events per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of pasteurization events) = Number of 1000SF. 21,000 SF / 1000 SF X 2 houses X 3 events = 126 units of 1000SF In house pasteurization of poultry litter is achieved by windrowing the litter in the house. The process takes approximately one week. This process successfully addresses the air quality impacts (ammonia emissions, PM and PM precursors) and bird health resource concerns. This process also improves the quality of poultry litter that must be spread on farmland. Bird health is improved and bird mortality is reduced.

Feature Measure: Surface Area of housing floor windr

Scenario Unit:: 1,000 Square Foot

Scenario Typical Size: 126.0

Scenario Total Cost: $5,512.92

Scenario Cost/Unit: $43.75

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.	Hour	$58.02	66	$3,829.32
Aerator Attachment, 8", PTO	1707	Aerator attachment for mounting to tractor and PTO, 8" diameter. Equipment cost only with out tractor. Brown Bear R24C-8' or equivalent	Hour	$9.92	30	$297.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	66	$1,386.00

USDA - Natural Resources Conservation Service

Tennessee

Practice: 629 - Waste Treatment

Scenario #2 - Milking Parlor Waste Treatment System with Dosing System and Bed

Scenario Description:

This practice scenario includes a dosed treatment system with bark bed for milking parlor wastewater. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: 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 the treatment bed (bark bed or leaching gallery). It is assumed that the treatment bed is dosed at 0.16 gal/square ft (3125 sq ft). To maintain bark bed performance, additional bark may need to be added every 3 to 5 years as an O&M task. 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: Design Flow

Scenario Unit:: Gallon per Day

Scenario Typical Size: 500.0

Scenario Total Cost: $21,932.87

Scenario Cost/Unit: $43.87

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	$65.00	1	$65.00
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	118	$598.26
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	450	$535.50
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yard	$20.59	350	$7,206.50
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.89	116	$103.24
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$3.77	254	$957.58
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.	Hour	$26.89	32	$860.48
Materials						
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	290	$400.20
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.57	10	$35.70
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	200	$1,264.00
Pipe, PE, 2", DR 9	1000	Materials: - 2" - PE - 160 psi - ASTM D3035 DR 9	Foot	$1.75	250	$437.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	119	$2,465.68
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.25	382	$477.50
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,733.63	2	$3,467.26
Dosing System, siphon	1763	Dosing system siphon with typical 3" diameter and 12" drawdown. Includes materials and shipping only.	Each	$280.29	1	$280.29
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	$70.51	2	$141.02

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	$171.75	4	$687.00
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	4	$1,950.16

Practice: 629 - Waste Treatment

Scenario #3 - 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: Design Flow

Scenario Unit:: Gallon per Day

Scenario Typical Size: 500.0

Scenario Total Cost: $10,438.65

Scenario Cost/Unit: $20.88

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	$65.00	1	$65.00
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	118	$598.26
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	450	$535.50
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 Yard	$3.77	138	$520.26
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.	Hour	$26.89	16	$430.24
Materials						
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.32	200	$1,264.00
Pipe, PE, 2", DR 9	1000	Materials: - 2" - PE - 160 psi - ASTM D3035 DR 9	Foot	$1.75	250	$437.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	3	$62.16
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,733.63	2	$3,467.26
Dosing System, siphon	1763	Dosing system siphon with typical 3" diameter and 12" drawdown. Includes materials and shipping only.	Each	$280.29	1	$280.29
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	$70.51	2	$141.02
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	$171.75	4	$687.00
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	4	$1,950.16

Practice: 632 - Waste Separation Facility

Scenario #1 - 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: $35,352.80

Scenario Cost/Unit: $35,352.80

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 Yard	$230.94	10	$2,309.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	16	$430.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
Materials						
Vibratory or Rotating Screen	1948	Vibratory or Rotating Screen, includes materials, shipping and equipment.	Each	$30,886.95	1	$30,886.95
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	3	$211.53
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 632 - Waste Separation Facility

Scenario #2 - 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 a 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 top width by 200 ft top length by 3 ft deep with 2.5:1 side slopes, 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 Design Storage

Scenario Unit:: Cubic Foot

Scenario Typical Size: 30,000.0

Scenario Total Cost: $13,310.34

Scenario Cost/Unit: $0.44

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 Yard	$359.17	12	$4,310.04
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	1000	$2,030.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	1000	$3,840.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	14	$420.70
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Foot	$51.94	24	$1,246.56
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	$70.51	3	$211.53
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 632 - Waste Separation Facility

Scenario #3 - 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 concrete settling basin structure (20 ft wide by 30 ft long with 3 ft high walls and weeping wall/picket structure or outlet control) 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 Design Storage

Scenario Unit:: Cubic Foot

Scenario Typical Size: 1,800.0

Scenario Total Cost: $13,249.31

Scenario Cost/Unit: $7.36

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 Yard	$230.94	19	$4,387.86
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	16	$5,746.72
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	50	$115.00
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 Yard	$2.03	50	$101.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	50	$192.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	31	$931.55
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Foot	$51.94	6	$311.64
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	$70.51	3	$211.53
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 632 - Waste Separation Facility

Scenario #4 - Concrete Basin, Multiple Cells, Gravity

Scenario Description:

A concrete basin containing multiple cells with concrete walls and floor. Basin cells use gravity and time to separate a portion of the solids from a liquid waste stream from a drylot dairy, animal production or confinement facility. Often used where manure is cleaned by flushing. Use of multiple separation cells allows for the continuous operation and management of the waste stream to be altered between cells thereby providing time for the solids portion to drain to be handled as a solid, according to the nutrient management plan. Removes a 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 and locations 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 gravity settling basin containing multiple cells. The multi cell basin structure is 70 feet wide by 80 ft long and 6 ft deep with an additional 10:1 entrance ramp. There are three cells to the basin with a clean out ramp the width of the structure on just one end. The center cell, used to drain the liquid portion, has 6 ft reinforced concrete "T" walls with weeping wall structures. The center cell design volume is considered no more than half full to maintain drainage of the facility. The two outside cells collecting the separated solids (25 ft x 80 ft x 6 ft plus ramp storage) have outside walls that are designed to store the solid settled portion of the waste. The waste stream enters the basin at either of the outside cells via a waste transfer component, the liquid portion of the waste flows into the center cell where it is then pumped to a waste storage facility. The pump and long-term liquid and solid waste storage facilities are contracted separately. Basin removes a portion of the solids that otherwise make handling the waste stream solids content difficult to manage over time. Part of an animal waste and nutrient management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit:: Cubic Foot

Scenario Typical Size: 26,250.0

Scenario Total Cost: $94,365.21

Scenario Cost/Unit: $3.59

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 Yard	$230.94	154	$35,564.76
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 Yard	$359.17	133	$47,769.61
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	570	$1,157.10
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	182	$698.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	182	$5,469.10
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Foot	$51.94	40	$2,077.60
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	$70.51	3	$211.53
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 632 - Waste Separation Facility

Scenario #5 - 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) 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 Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $32,771.57

Scenario Cost/Unit: $6.55

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 Yard	$230.94	90	$20,784.60
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 Yard	$359.17	20	$7,183.40
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 Yard	$2.03	180	$365.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	90	$345.60
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	93	$2,794.65
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	$70.51	3	$211.53
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$487.54	1	$487.54

Practice: 633 - Waste Recycling

Scenario #1 - Export Ag Waste By-products Recycled for Use Off Farm

Scenario Description:

Agricultural by-products on the farm are in excess of the ability of the farm and limited crop land base to utilize. These waste materials are accumulating in such a manner that the water, soil and/or air quality have resource concerns. The application of a waste management plan will recycle these by-products such that the quality of the natural resources will be improved and the environment protected. The agricultural by-products are tested and exported off the farm operation for external uses. Records are kept detailing disposition of the waste, including date, amount, and receiver of the waste. Results of the agricultural by-product laboratory analysis is also provided to the receiver. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

Before Situation:

Agricultural by-products are produced or accumulated on the farm in amounts that cannot be utilized by the farm without causing resource concerns such as degradation of water quality, soil health and/or air quality.

After Situation:

Twice a year the excess agricultural by-products that have been collected at the farm are sampled and laboratory tested to determine the characteristics of the waste material that is recycled. The results of this analysis will determine the basis of its use. The agricultural by-products are then handled according to the waste management system plan. The intended off-farm use of the recycled agricultural waste by-products will refer to the laboratory analysis. Records shall be kept of the analysis, dates and quantities of recycled waste exported.

Feature Measure: Farm

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $457.22

Scenario Cost/Unit: $457.22

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.	Hour	$38.33	4	$153.32
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.	Hour	$106.41	2	$212.82
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.54	2	$91.08

Practice: 634 - Waste Transfer

Scenario #1 - 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:: Gallon

Scenario Typical Size: 1,000.0

Scenario Total Cost: $7,206.14

Scenario Cost/Unit: $7.21

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 Yard	$230.94	4	$923.76
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 Yard	$359.17	2	$718.34
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	8	$450.96
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	4	$266.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	4	$232.08
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	2	$20.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	24	$495.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	16	$613.28
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	5	$103.60
Catch Basin, concrete, 60" dia.	1754	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,161.32	1	$2,161.32
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	$171.75	2	$343.50

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #2 - 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:: Gallon

Scenario Typical Size: 4,300.0

Scenario Total Cost: $13,186.24

Scenario Cost/Unit: $3.07

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 Yard	$230.94	6	$1,385.64
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	14	$5,028.38
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	24	$1,352.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	8	$464.16
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	3	$30.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	64	$1,320.96
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	24	$919.92
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	12	$248.64
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.	Foot	$2.91	40	$116.40
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	$171.75	2	$343.50

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service **Tennessee**

Practice: 634 - Waste Transfer

Scenario #3 - 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:: Gallon

Scenario Typical Size: 8,600.0

Scenario Total Cost: $19,920.32

Scenario Cost/Unit: $2.32

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 Yard	$230.94	11	$2,540.34
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	22	$7,901.74
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	32	$1,803.84
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	12	$798.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	16	$928.32
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	80	$1,651.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	28	$588.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	32	$795.20
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.	Hour	$38.33	40	$1,533.20
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	15	$310.80
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.	Foot	$2.91	60	$174.60
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	$171.75	2	$343.50

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #4 - Medium sized wastewater reception pit with 6 inch conduit transfer pipe to waste storage pond

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect a design volume between 1000 and 5000 gallons of liquids such as silage leachate, lot runoff and other contaminated liquid effluent which is then transferred through a 6" low pressure conduit to the waste storage structure. This scenario includes a reinforced concrete manure reception pit and a 6" PVC SDR 41 conduit to transfer the manure and wastewater to a waste storage pond. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant 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 transfer of waste water to a waste storage facility is required for the CNMP.

After Situation:

This practice scenario is for the estimated design volume for waste collection and transfer of 4300 gallons of liquid waste and can be transferred under gravity or low pressure flow in a 6" PVC pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters at the basin 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 transfer pipeline is assumed to be 300 feet long, 6" PVC gasketed SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit:: Gallon

Scenario Typical Size: 4,300.0

Scenario Total Cost: $16,985.20

Scenario Cost/Unit: $3.95

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 Yard	$230.94	6	$1,385.64
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	14	$5,028.38
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	32	$1,803.84
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	16	$928.32
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	3	$30.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	96	$1,981.44
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	24	$504.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	32	$795.20
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.	Hour	$38.33	32	$1,226.56
Materials						
Pipe, PVC, 6", SDR 41	984	Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$4.32	330	$1,425.60
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	18	$372.96

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.	Foot	$2.91	40	$116.40
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #5 - Large reception pit, 8 inch pipe to treatment, plus 6 inch pipe to storage.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this 8600 gallon pit is intended to be transferred to final storage within a 48 hour period. The waste is transferred through an 8" conduit to a waste treatment location. After treatment the remaining liquids are transferred to the waste storage pond in a 6" pipeline. This scenario includes a reinforced concrete manure reception pit an 8" conduit to transfer the manure and wastewater to a treatment location and a secondary 6" transfer pipeline. Reception Pit includes safety fence w/gate or solid/grated cover. The 8" transfer conduit and 6" transfer pipeline consists of the pipe plus the inlet structures connections and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant 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 transfer of waste water to a waste storage facility is required for the CNMP. Additional waste treatment is required for the waste stream prior to reaching in the waste storage pond.

After Situation:

This practice scenario is suitable where the estimated design volume for waste collection and transfer is greater than 5000 gallons of liquid waste and can be transferred under gravity or low pressure flow in an 8" conduit to a waste treatment site. Then the remaining liquids will be transferred in a 6" pipeline to a waste storage pond. 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 first stage transfer pipeline is assumed to be 200 feet long, 8" PVC gasketed SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design. The second stage transfer pipe is assumed to be 500 feet long 6" PVC gasketed SDR 41 pipe with an adapter for the wastewater treatment system, couplers, air-vac vents, all other fittings placed as specified by the design.. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit:: Gallon

Scenario Typical Size: 8,600.0

Scenario Total Cost: $27,450.80

Scenario Cost/Unit: $3.19

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 Yard	$230.94	11	$2,540.34
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	22	$7,901.74
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	40	$2,254.80
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	12	$798.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	24	$1,392.48
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	140	$2,889.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	36	$756.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	40	$994.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	40	$1,533.20
Materials						
Pipe, PVC, 6", SDR 41	984	Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$4.32	220	$950.40

Pipe, PVC, 8", SDR 41	985	Materials: - 8" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$7.08	550	$3,894.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	23	$476.56
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.	Foot	$2.91	60	$174.60
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service

Tennessee

Practice: 634 - Waste Transfer

Scenario #6 - Concrete Channel

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 to enable the facility manager to direct liquid waste to an existing 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: 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.

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 purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility. Includes safety chain for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit:: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $14,341.47

Scenario Cost/Unit: $11.95

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 Yard	$230.94	22	$5,080.68
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	11	$3,950.87
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	64	$1,320.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	50	$1,916.50
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	26	$538.72
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" or larger sphere. Includes materials only.	Foot	$15.71	16	$251.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #7 - Concrete Channel, 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 to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility at the end of a push-off ramp. A safety gate is installed at the end of the push-off ramp. 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: 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.

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. 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. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit:: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $17,208.47

Scenario Cost/Unit: $14.34

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 Yard	$230.94	22	$5,080.68
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	17	$6,105.89
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	5	$51.10
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.	Hour	$20.64	98	$2,022.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	50	$1,916.50
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	26	$538.72
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" or larger sphere. Includes materials only.	Foot	$15.71	16	$251.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

USDA - Natural Resources Conservation Service

Tennessee

Practice: 634 - Waste Transfer

Scenario #8 - Concrete channel, to medium sized wastewater reception pit

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 to enable the facility manager to direct liquid waste to a 4300 gallon wastewater 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: 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.

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 purpose is to transfer liquids or manure slurry from one area to a 8'x12'x6' collection basin or waste storage facility. Includes safety chain around the basin for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit:: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $22,828.01

Scenario Cost/Unit: $19.02

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 Yard	$230.94	22	$5,080.68
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	23	$8,260.91
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	24	$1,352.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	120	$2,476.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	60	$2,299.80
Materials						
Pipe, Steel, 3", SCH 40	1003	Materials: - 3" - Steel SCH 40	Foot	$14.66	30	$439.80
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	28	$580.16
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.	Foot	$2.91	50	$145.50
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #9 - Concrete channel, to medium reception pit, 6 inch pipe to storage.

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 to enable the facility manager to direct liquid waste to a 4300 gallon collection basin and/or waste storage facility. The wastewater is then transferred from the basin to the waste storage pond through a 6" diameter low pressure pipeline. 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: 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.

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. Waste transfer structures are needed to transfer wastes to a waste storage pond

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 waste transfer scenario is to scrape liquids or manure slurry from the waste production area down the channel to a 8'x12'x6' collection basin. From the basin it is then transferred through a 6" pipe 500 feet to the waste storage pond. The scenario also includes a safety chain around the basin. The transfer pipe is a 6" diameter gasketed PVC SDR 41 low pressure pipeline. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit:: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $27,416.36

Scenario Cost/Unit: $22.85

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 Yard	$230.94	22	$5,080.68
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	23	$8,260.91
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	45	$228.15
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.73	500	$1,365.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	24	$1,352.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	8	$532.00
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	150	$3,096.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	60	$2,299.80
Materials						
Pipe, PVC, 6", SDR 41	984	Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$4.32	550	$2,376.00
Pipe, Steel, 3", SCH 40	1003	Materials: - 3" - Steel SCH 40	Foot	$14.66	30	$439.80

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	28	$580.16
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.	Foot	$2.91	50	$145.50
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #10 - Small Flush System, less than 1000 gallon per flush to reception pit, 8 inch pipe to storage.

Scenario Description:

Installation of a manure and wastewater collection system that includes materials and structures to flush waste from a concrete surface into a collection basin and transferred to a waste storage pond. This small flush system must have an adequate source for the flush water and will use an 8" diameter pipe. The system may include flush water tank, piping and valves, concrete flush lane, concrete curbs or gutter, precast manholes, sumps or catch basins. The animal waste will be transferred by a flush cycle released from the flush tank to rinse the concrete surface and carry the waste to a collection basin, into a pipe and to a waste storage pond. 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 animal waste.

Before Situation:

A small 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:

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. The design flush volume for a small wastewater flush system is less than 1000 gallons and requires no more than 50 feet of an 8 inch diameter pressure pipe for the flush pipe. The scenario includes materials and installation of a flush tank, piping and valves to manage the flush flow, concrete flush lane, concrete curbs or gutters to transfer the flow to a collection basin. The liquids then flow from the basin to the waste storage pond, an estimated length of 200 feet and requires an 8 inch diameter low pressure pipeline with an open outlet to the waste storage pond. The cost includes excavation, placement of bedding aggregate as needed, forming and placement of structures, conveyance pipeline with valves and structural backfill. Pump must be contracted under pumping plant, PS 533.

Feature Measure: 1000 Gallons of flush water

Scenario Unit:: Gallon

Scenario Typical Size: 1,000.0

Scenario Total Cost: $14,238.47

Scenario Cost/Unit: $14.24

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 Yard	$230.94	7	$1,616.58
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	$359.17	3	$1,077.51
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	20	$1,127.40
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	4	$266.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	4	$232.08
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	60	$1,238.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	20	$497.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	30	$1,149.90
Materials						
Pipe, PVC, 8", SDR 21	988	Materials: - 8" - PVC - SDR 21 200 psi - ASTM D2241	Foot	$13.56	55	$745.80
Pipe, PVC, 8", SDR 35	994	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	$8.33	220	$1,832.60
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallon	$0.92	1000	$920.00

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	15	$310.80
Catch Basin, concrete, 60" dia.	1754	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,161.32	1	$2,161.32
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #11 - Wastewater Flush Transfer System, Pipes only, 12 inch diameter

Scenario Description:

Installation of the pipe for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a waste storage pond. This may include pipe and valves, concrete flush lane, concrete curbs or gutter. The animal waste will be transferred by recycled flush water through the pipe system to rinse the concrete surface and carry the waste to a waste storage pond. 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 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:

This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete surfaces. The pipe design for the flush volume requires100 feet of 12 inch diameter pipe for pressure flow. The flushed wastes are then piped from an existing collection basin to the waste storage pond an estimated length of 200 feet through a 12 inch diameter low pressure pipe with an open outlet at the pond. The cost includes excavation, placement of bedding as needed, flush and conveyance pipelines with valves and pipe backfill. Pumps must be contracted under pumping plant, PS 533.

Feature Measure: Flush - pipes

Scenario Unit:: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $15,972.95

Scenario Cost/Unit: $53.24

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 Yard	$230.94	8	$1,847.52
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	66	$334.62
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	30	$1,691.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	8	$464.16
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	70	$1,444.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	30	$745.50
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.	Hour	$38.33	35	$1,341.55
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	10	$296.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	6	$124.32
Pipe, PVC, 12", SDR 35	1252	Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only.	Foot	$18.66	220	$4,105.20
Pipe, PVC, 12", SDR 21	1717	Materials: - 12" - PVC - SDR 21 - ASTM D2241	Foot	$22.86	110	$2,514.60
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	$171.75	2	$343.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #12 - Hopper gravity inlet, 24 inch diameter HDPE pipeline, to waste storage facility

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit 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. 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.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

After Situation:

Install an 80 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit:: Foot

Scenario Typical Size: 80.0

Scenario Total Cost: $9,879.10

Scenario Cost/Unit: $123.49

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 Yard	$230.94	7	$1,616.58
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	61	$123.83
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	33	$167.31
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	15	$47.25
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.	Hour	$63.09	16	$1,009.44
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	4	$40.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	36	$743.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	16	$397.60
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.	Hour	$38.33	16	$613.28
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	7	$207.55
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	7	$145.04
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	1246	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$23.81	88	$2,095.28
Catch Basin, concrete, 60" dia.	1754	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,161.32	1	$2,161.32
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #13 - 30 inch HDPE conduit, gravity flow, from an existing inlet structure to site of treatment or storage.

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an existing inlet structure or hopper with attachment to a smooth interior large diameter pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the pipe attachment to an existing inlet structure and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit 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. 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.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

After Situation:

Install a 150 foot long 30" diameter water tight HDPE pipe to transfer manure by gravity from one location to another. A gravity transfer system typically consists of a sealed inlet at an existing waste collection structure to a smooth interior 30" sewer grade pipe that will gravity flow to an outlet at a site of manure treatment or storage. This scenario includes the pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. If required an inlet structure may be contracted under another scenario. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit:: Foot

Scenario Typical Size: 150.0

Scenario Total Cost: $14,146.41

Scenario Cost/Unit: $94.31

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 Yard	$230.94	14	$3,233.16
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	125	$253.75
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	57	$288.99
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	45	$141.75
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	30	$1,691.10
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	7	$71.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	48	$990.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	30	$745.50
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.	Hour	$38.33	20	$766.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	13	$385.45
Pipe, HDPE, CPT, Double Wall, Soil Tight, 30"	1247	Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$30.71	165	$5,067.15
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #14 - 12 inch diameter, Low pressure flow, PVC conduit

Scenario Description:

Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit 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 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. 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.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.

After Situation:

Install a 300 foot long 12 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipe flow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system. The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit:: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $13,972.38

Scenario Cost/Unit: $46.57

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 Yard	$230.94	14	$3,233.16
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.03	97	$196.91
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	56	$283.92
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	$3.15	33	$103.95
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	32	$1,803.84
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$10.22	7	$71.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	64	$1,320.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	32	$795.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	14	$415.10
Pipe, PVC, 12", SCH 40	1716	Materials: 12" dia. PVC SCH 40, ASTM D1785	Foot	$15.87	330	$5,237.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #15 - 10 inch diameter, Low pressure flow PVC pipeline, from waste storage pond to land application site.

Scenario Description:

Low pressure flow pipeline used to transfer manure wastewater by a low pressure pump from the waste storage pond to the field where it is applied according to the CNMP. The pipeline moves the water from the pond through a buried mainline with low pressure outlets that spread the water on a vegetated treatment area or to a site where the water is applied through an existing field application system. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of 100 psi or less. This practice 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, and are included in the cost of pipe material (additional 10% of pipe material quantity). 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. 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; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

After Situation:

Install a 1000 foot long 10 inch diameter PVC gasketed IPS pipe that has an SDR of 41 and is water tight under low 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 pumping pressure and flow volume for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $23,413.80

Scenario Cost/Unit: $23.41

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 Yard	$113.81	1	$113.81
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	127	$643.89
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.73	1000	$2,730.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	70	$1,444.80
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.	Hour	$38.33	20	$766.60
Materials						
Pipe, PVC, 10", SDR 21	1714	Materials: - 10" - PVC - SDR 21 - ASTM D2241	Foot	$15.64	1100	$17,204.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #16 - 6 inch diameter, Pressure flow PVC pipeline, from waste storage pond to land application site.

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. Pressure flow transfer pipelines can be between 3" and 12" diameter but 6" diameter is a commonly used pipe size. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketed joints to seal for the wastewater transfer. The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers spaced at 300 ft intervals for a traveler applicator. This practice 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, and are included in the cost of pipe material (additional 10% of pipe material quantity). 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. 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; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

After Situation:

Install a 1000 foot long 6 inch diameter PVC gasketed 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. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $14,877.21

Scenario Cost/Unit: $14.88

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 Yard	$113.81	1	$113.81
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	$5.07	90	$456.30
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.73	1000	$2,730.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	70	$1,444.80
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.	Hour	$38.33	20	$766.60
Materials						
Pipe, PVC, 6", SDR 21	987	Materials: - 6" - PVC - SDR 21 200 psi - ASTM D2241	Foot	$8.05	1100	$8,855.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 634 - Waste Transfer

Scenario #17 - Agitator, small, mixing contents of a reception pit that is no more than 10 ft. deep.

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the production source to a storage facility for proper utilization. This agitator is typically no more than 15 HP and is used for smaller waste storage facilities that are less than 10 feet deep. This scenario does not include a pump. 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. 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 a small waste storage structure from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

The typical installation would be for a small manure 10 HP agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Feature Measure: Agitator for wastewater, installed

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $11,960.62

Scenario Cost/Unit: $11,960.62

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.	Hour	$26.89	11	$295.79
Materials						
Manure agitator, mixing depth less than 10 feet.	1768	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$11,523.81	1	$11,523.81
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	$70.51	2	$141.02

Practice: 634 - Waste Transfer

Scenario #18 - Agitator, medium, mixing contents of a reception pit that is 10 ft to 15 ft. deep.

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 30 HP and is used where the waste storage facility tank or pond is between 10 and 15 feet deep. This scenario does not include a pump. 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. 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 a confined 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 a medium 30 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Feature Measure: Agitator for wastewater, installed

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $18,475.70

Scenario Cost/Unit: $18,475.70

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.	Hour	$26.89	12	$322.68
Materials						
Manure agitator, mixing depth 10 to 15 feet deep	1766	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$17,809.52	1	$17,809.52
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	$171.75	2	$343.50

Practice: 634 - Waste Transfer

Scenario #19 - Agitator, large, mixing contents of a reception pit that is over 15 ft. deep.

Scenario Description:

This scenario is for a large manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 100 HP and is used where the waste storage facility tank or pond is greater than15 feet deep. This scenario does not include a pump. 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. 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 a confined 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 a large 100 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This agitator is for a tank deeper than 15 feet and is part of an animal waste management system to address water quality concerns. This covers the cost of the agitator equipment materials and labor for the electrical hook-up.

Feature Measure: Agitator for wastewater, installed

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $27,023.86

Scenario Cost/Unit: $27,023.86

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.	Hour	$26.89	12	$322.68
Materials						
Manure agitator, mixing depth greater than 15 feet deep.	1767	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$26,190.48	1	$26,190.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 635 - Vegetated Treatment Area

Scenario #1 - Graded Area, Gravity Flow Surface Application

Scenario Description:

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow into 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), 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 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 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) could be contracted to provide pre-treatment 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $6,972.81

Scenario Cost/Unit: $6,972.81

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	$2.30	400	$920.00
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 Yard	$2.03	70	$142.10
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$66.50	16	$1,064.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	20	$412.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	16	$397.60
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	70	$2,103.50
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	45	$62.10
Coupling, PVC, endcap, 2", SCH 20	1727	2" - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only.	Each	$1.86	15	$27.90
Pipe, PE, 6", DR 9, perforated	1728	Materials: -6" - Perforated PE- 160 psi - ASTM D3035 DR 9	Foot	$15.77	80	$1,261.60
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	$70.51	1	$70.51
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 635 - Vegetated Treatment Area

Scenario #2 - Graded Area, Pumped Into A Basin, Gravity Flow Surface Application

Scenario Description:

This is a permanent herbaceous vegetative area or channel located upslope from the livestock production area. The topography of the site requires wastewater to be pumped uphill to the VTA designed system. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped uphill to a shallow tank or basin where it has a controlled gravity outflow into 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), 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 installation site to be upslope from the production area with a shallow tank or basin that provides a controlled gravity outflow 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) and Pumping Plant (533) to get the wastewater upslope to the VTA distribution point. For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $11,658.44

Scenario Cost/Unit: $11,658.44

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 Yard	$230.94	2	$461.88
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 Yard	$359.17	12	$4,310.04
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	400	$920.00
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 Yard	$2.03	100	$203.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	40	$825.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	6	$177.90
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	70	$2,103.50
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	45	$62.10
Ball Valve, 4"	1726	4" ball valve, metal body. Materials only.	Each	$326.60	2	$653.20
Coupling, PVC, endcap, 2", SCH 20	1727	2" - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only.	Each	$1.86	15	$27.90
Pipe, PE, 6", DR 9, perforated	1728	Materials: -6" - Perforated PE- 160 psi - ASTM D3035 DR 9	Foot	$15.77	80	$1,261.60
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 635 - Vegetated Treatment Area

Scenario #3 - Graded Area, 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), 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,047.19

Scenario Cost/Unit: $2,047.19

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.	Hour	$66.50	16	$1,064.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	16	$397.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 635 - Vegetated Treatment Area

Scenario #4 - Existing Vegetative Area, Gravity Flow Surface Application

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), 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 gravel trenches and perforated pipe to establish sheet flow into the VTA where an existing permanent herbaceous 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $8,339.70

Scenario Cost/Unit: $8,339.70

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 Yard	$359.17	7	$2,514.19
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.30	445	$1,023.50
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 Yard	$2.03	75	$152.25
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.	Hour	$20.64	16	$330.24
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	75	$2,253.75
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.38	40	$55.20
Coupling, PVC, endcap, 2", SCH 20	1727	2" - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only.	Each	$1.86	20	$37.20
Pipe, PE, 6", DR 9, perforated	1728	Materials: -6" - Perforated PE- 160 psi - ASTM D3035 DR 9	Foot	$15.77	100	$1,577.00
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	$70.51	2	$141.02
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 635 - Vegetated Treatment Area

Scenario #5 - Existing Area, Pod Sprinkler System 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), 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 2.0 ac in size. Typically does not require grading and shaping to maintain as uniform application onto the VTA is made through a mobile pod type sprinkler system. 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. The system is sized such that the total number of Pods will distribute wastewater to half of the VTA, 1 ac. The pods will be relocated to distribute wastewater to the other half of the VTA. The VTA is 400 ft x 220 ft. A 400 ft pipeline with 8 risers spaced 50 ft apart extends down one side of the VTA. Each Pod Line is 200 ft long with 5 pods spaced at 40 ft increments. The total number of Pods is 20 (8 risers/2 x 5 pods/line = 20 pods). 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 onto 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $10,770.43

Scenario Cost/Unit: $5,385.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trencher, 8"	936	Equipment and power unit costs. Labor not included.	Hour	$90.34	8	$722.72
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.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Materials						
Irrigation, Pod System, w/Appurtenances	323	Pod irrigation system that includes pod, pipe, sprinklers, connections, and appurtenances. Includes materials only.	Each	$254.03	20	$5,080.60
Pipe, PVC, 4", SDR 21	986	Materials: - 4" - PVC - SDR 21 200 psi - ASTM D2241	Foot	$3.74	428	$1,600.72
Ball Valve, 4"	1726	4" ball valve, metal body. Materials only.	Each	$326.60	8	$2,612.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 638 - Water and Sediment Control Basin

Scenario #1 - WASCOB, greater than 250 CY

Scenario Description:

Typical scenario s for the construction of 700 CY earthen embankment. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed 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. 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 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) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with 700 CY of 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 Yard

Scenario Typical Size: 700.0

Scenario Total Cost: $2,043.68

Scenario Cost/Unit: $2.92

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 Yard	$2.50	700	$1,750.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 638 - Water and Sediment Control Basin

Scenario #2 - WASCOB topsoil

Scenario Description:

Typical scenarios for the construction of 700 CY earthen embankment. Prior to building 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 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 with 700 CY of 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 Yard

Scenario Typical Size: 700.0

Scenario Total Cost: $2,266.18

Scenario Cost/Unit: $3.24

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 Yard	$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 Yard	$2.50	700	$1,750.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 638 - Water and Sediment Control Basin

Scenario #3 - WASCOB less than 250 CY

Scenario Description:

Typical scenario s for the construction of 200 CY earthen embankment. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed 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. 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 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) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with 200 CY of 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 Yard

Scenario Typical Size: 200.0

Scenario Total Cost: $793.68

Scenario Cost/Unit: $3.97

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 Yard	$2.50	200	$500.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: 642 - Water Well

Scenario #1 - Drilled well for unconsolidated geologic sites with unstable rock formations (extensive casing)

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface in unstable (unconsolidated) geologic formations. The well shall be drilled, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Plastic casing is installed to a depth of 390 feet.

Before Situation:

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:

Sufficient water is available for livestock or micro-irrigation. 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: Linear ft. of depth

Scenario Unit:: Foot

Scenario Typical Size: 400.0

Scenario Total Cost: $12,285.85

Scenario Cost/Unit: $30.71

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 Yard	$113.81	0.25	$28.45
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$341.34	23	$7,850.82
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$44.74	1	$44.74
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	$669.22	2	$1,338.44
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.82	1	$2.82
Well Cap, 6"	1786	Well cap, 6". Materials only.	Each	$34.23	1	$34.23
Well Casing, Plastic, 6"	1804	PVC or ABS non-threaded well casing, 6". Materials only.	Foot	$6.64	390	$2,589.60
Well Screen, plastic, 6"	1999	6" PVC well screen. Materials only.	Foot	$14.14	10	$141.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 642 - Water Well

Scenario #2 - Drilled well for consolidated geologic sites with stable rock formations (limited casing)

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface in stable (consolidated) geologic formations. The well shall be drilled, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 100 feet.

Before Situation:

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:

Sufficient water is available for livestock or micro-irrigation. 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: Linear ft. of depth

Scenario Unit:: Foot

Scenario Typical Size: 450.0

Scenario Total Cost: $10,994.85

Scenario Cost/Unit: $24.43

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 Yard	$113.81	0.25	$28.45
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hour	$341.34	23	$7,850.82
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$44.74	1	$44.74
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	$669.22	2	$1,338.44
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.82	1	$2.82
Well Cap, 6"	1786	Well cap, 6". Materials only.	Each	$34.23	1	$34.23
Well Casing, Metal, 6"	1810	Steel well casing, 6". Materials only.	Foot	$14.40	100	$1,440.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario #13 - Habitat Monitoring, Native Forest Ecosystem

Scenario Description:

This scenario is applied to nonindustrial private forestland 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 moderate intensity and complexity of monitoring will treat the identified resource concern. One monitoring plot is needed for every 10-acres, due to viability of site conditions. Collection of data at each monitoring plot a Specialist and a Technician performing an average of 1.25 hours of labor each, per plot (including time to travel between the plot locations. Monitoring involves selection of random plot locations on a map, collection of photos at plot center, measure of forest stand age, measurement of % percent native groundcover, measurement of percent hardwood mid-story, measurement of stand density, determination of 50-year site index; and concludes with development of written adaptive management recommendations for advancing Longleaf ecosystem restoration on the site. Equipment needed in a monitoring team's kit includes a 10-factor prism, an increment borer, a digital camera, and a meter-square frame, a transect string. A conservation plan will normally repeat this monitoring scenario in consecutive years in order to evaluate the impact of other conservation practices planned and contracted to meet the restoration objective.

Before Situation:

Rare or declining native forest habitat is at risk due to the absence of management and the absence of monitoring, plus the unpredictable results from typical forest ecosystem management actions. A system of restoration practices is needed and so is annual monitoring to evaluate the effects of conservation practices on the ecosystem; and to provide adaptive management recommendations that help achieve the restoration objectives.

After Situation:

Rare and declining native forest habitat is improved by incorporating data collected during monitoring and by enhancing native ground cover quantity and quality. Future management for native forest ecosystem restoration is shaped by results from the monitoring and data collection.

Feature Measure: Acres monitored

Scenario Unit:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $928.03

Scenario Cost/Unit: $18.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
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	$51.08	1	$51.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	6.25	$168.06
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.	Hour	$106.41	6.25	$665.06

Practice: 644 - Wetland Wildlife Habitat Management

Scenario #4 - Habitat Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all land use 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:: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $2,471.08

Scenario Cost/Unit: $30.89

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.	Hour	$114.38	4	$457.52
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	8	$35.12
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	6	$131.46
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	3	$156.60
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	$51.08	1	$51.08
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.	Hour	$20.64	20	$412.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
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.	Hour	$106.41	10	$1,064.10

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 open lands 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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $808.12

Scenario Cost/Unit: $40.41

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.	Acre	$16.70	20	$334.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$58.02	6	$348.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	6	$126.00

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 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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,191.72

Scenario Cost/Unit: $109.59

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.	Hour	$195.23	6	$1,171.38
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	20	$334.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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	$487.54	1	$487.54

Practice: 645 - Upland Wildlife Habitat Management

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $460.00

Scenario Cost/Unit: $23.00

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.	Acre	$16.70	20	$334.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	6	$126.00

Practice: 646 - Shallow Water Development and Management

Scenario #1 - Shallow Water Management

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". Water is provided by natural flooding and/or precipitation.

Before Situation:

There is inadequate habitat 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. 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.). If needed and dikes or water control structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: Acre of shallow water

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $85.64

Scenario Cost/Unit: $85.64

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	$65.00	1	$65.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	1	$20.64

Practice: 647 - Early Successional Habitat Development/Management

Scenario #2 - Habitat 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 creating 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 or 666 forest stand improvement should be used. Where chemical control of weeds, including invasive, 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 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to higher successional plant species. The disturbance regime 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 such 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 openness 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $205.15

Scenario Cost/Unit: $102.58

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.	Acre	$16.70	2	$33.40
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	$171.75	1	$171.75

Practice: 647 - Early Successional Habitat Development/Management

Scenario #3 - Early Successional Habitat Forest Opening (Clear-cut)

Scenario Description:

Early successional habitat (ESH) openings involve creating 2-acre clear-cut patches in closed-canopy or degraded stands using hand tools such as chainsaws. The goal is to provide openings of early successional habitat within a matrix of later successional, more mature forested habitat. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation. ESH openings within central hardwood stands progress from sapling to pole-timber sized trees, and the range of successional stages has the potential to provide optimal food (increased soft mast and browse) and cover (high stem density, down woody debris) for several years, which benefits the numerous life stages of early successional target wildlife. A professional wildlife biologist will delineate ESH openings at least 2 acres or greater in size. Location of wildlife openings can be adjusted to avoid steep slopes, riparian zones, and other environmentally sensitive areas, but can be located in xeric to mesic conditions. Tree tops can be removed to provide optimal conditions for tree and shrub regeneration, or left in place to deter deer browse while still providing open-canopy conditions that promotes early succession. To ensure a diversity of successional stages and maintain the overall forest habitat matrix, ESH openings should not exceed 25% of total forestland acreage per stand or tract, as determined by a professional wildlife biologist. Felling trees with chainsaws should occur from November 15th through March 31st to minimize disturbance to nesting wildlife, especially federally listed Indiana bats.

Before Situation:

The existing stand is closed-canopy with very little understory vegetation (tree reproduction or herbaceous species). The stand likely has been degraded in value by past harvesting practices so that the level of acceptable growing stock is too low to justify managing for timber production in its present condition, and/or the landowner's primary concern is not timber but maximizing the abundance and diversity wildlife using the stand. 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, including soft mast producing shrub species.

After Situation:

A new, young stand of desirable trees, shrubs, briars, vines, and herbaceous species is established within the ESH opening because the existing tree canopy is removed allowing full sunlight to reach the ground. The ESH opening provides diversity within the overall forested habitat matrix, which diversifies habitat conditions to benefit a variety of wildlife. Within this ESH opening, succession progresses from mostly seedlings and herbaceous plants, to briars and saplings, to pole-sized stages, to eventual canopy closure in 15-20 years. Woody stem density will increase until the canopy closes, providing previously unavailable cover for reproduction, foraging, and escape used by a variety of game and non-game wildlife. Different species utilize the various stages of succession, and some use the entire continuum.

Feature Measure: width and length of treated area

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,660.62

Scenario Cost/Unit: $830.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	28	$122.92
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
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.	Hour	$20.64	9	$185.76
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.	Hour	$38.33	32	$1,226.56
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74

Practice: 647 - Early Successional Habitat Development/Management

Scenario #4 - Edge Feathering (Cutback Borders)

Scenario Description:

Edge feathering involves cutting over story trees within a 30-50' zone along the edge of forestland using hand tools such as chainsaws. The goal is to create a transitional zone between later successional stages like mature forest and very early successional stages like open fields. The forest over story is removing allowing more sunlight deeper into the forest edge, which releases shade-intolerant trees and shrubs that can provide optimal food (increased soft mast and browse) and cover (high stem density, down woody debris) for numerous life stages of early successional target wildlife. A professional wildlife biologist will delineate edge feathering areas so that they extend at least 30 feet into the edge to reduce predation, but width of the feathered area can vary. Leave trees or shrubs of special wildlife benefit, such as dogwoods, viburnums, serviceberry, etc. Leaving cut slash and debris within the cutback area provides additional wildlife cover. Edge feathering along a given forest edge can occur at different times (years) to provide diversity in stages of growth. Herbicides may be used to control regeneration of undesirable species. Resource concerns within this zone include: Inadequate structure and composition and habitat degradation. Felling trees with chainsaws should occur from November 15th through March 31st to minimize disturbance to nesting wildlife, especially federally listed Indiana bats.

Before Situation:

There is a "hard edge" (high contrast) between a closed-canopy forest with very little mid/understory herbaceous vegetation and an adjacent open field with very little woody cover. Little to no transitional habitat occurs between the two habitat types, hindering movement of species that utilize portions of both habitats. Few shade-intolerant, soft mast producing shrubs are present along the forest edge.

After Situation:

A transitional area of young trees, shrubs, briars, vines, and herbaceous species is established along and at least 30 feet into a forest edge because the existing tree canopy was removed allowing full sunlight to reach the ground. The feathered edge/cutback border provides strategically located habitat diversity, which benefits a variety of wildlife. Within this feathered edge, succession progresses from mostly seedlings and herbaceous plants, to briars and saplings, to pole-sized stages, to eventual canopy closure in 15-20 years. Woody stem density will increase until the canopy closes, providing previously unavailable cover for reproduction, foraging, and escape used by a variety of game and non-game wildlife. Different species utilize the various stages of succession, and some use the entire continuum. The early successional benefit is extended if additional/adjacent areas are treated in subsequent years, or if the same areas are treated again before canopy closure.

Feature Measure: width and length of treated area

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $946.62

Scenario Cost/Unit: $473.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	16	$70.24
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	17	$651.61
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74

Practice: 647 - Early Successional Habitat Development/Management

Scenario #5 - Habitat Selective Herbicide

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by applying herbicide to selectively control undesirable woody plants will improve habitat for the target species. Selective control of woody plants can increase habitat structural and botanical diversity by creating opportunities for grasses and forbs, preferred by target wildlife species during certain stages of life, to compete for sunlight, water and space. In this typical scenario a selective herbicide containing the active ingredient Imazapyr is applied by ground equipment to the target area. The typical setting for this scenario is at the edge of crop fields, the edge of pastures, the edge of forests, and in odd areas around agricultural operations.

Before Situation:

The site is static or trending to later successional plant community. The disturbance forces needed 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 successional habitat conditions are created or improved. The diversity of the habitat structure and composition has been increased.

Feature Measure: width and length of treated area

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $88.00

Scenario Cost/Unit: $44.00

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.	Acre	$6.17	2	$12.34
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.	Acre	$37.83	2	$75.66

Practice: 647 - Early Successional Habitat Development/Management

Scenario #6 - Habitat Non-Selective Herbicide

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by applying herbicide to fully control undesirable plant growth will improve habitat for the target species. Thorough vegetation control is needed to increase habitat structural and botanical diversity by creating opportunities for grasses and forbs, preferred by target wildlife species during certain stages of life, to compete for sunlight, water and space. In this typical scenario a non-selective herbicide containing the active ingredient Glyphosate is applied by ground equipment to the target area. The typical setting for this scenario is at the edge of crop fields, the edge of pastures, the edge of forests, and in odd areas around agricultural operations.

Before Situation:

The site is static or trending to later successional plant community. The disturbance forces needed 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 successional habitat conditions are created or improved. The diversity of the habitat structure and composition has been increased.

Feature Measure: width and length of treated area

Scenario Unit:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $50.08

Scenario Cost/Unit: $25.04

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.	Acre	$6.17	2	$12.34
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	2	$37.74

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario #1 - Road/Trail Abandonment/Rehabilitation (Light)

Scenario Description:

Reshaping a 12' wide trail to natural conditions. This scenario includes using light equipment such as a backhoe for the installation of water control devices such as water bars, rolling dips, controlling access, use of woody residue and pulling drainages on 500 feet of road on 35% hill slopes and a moderate grade. Cool season grasses are re-established by seeding. Some light hand work may be needed to clear site for the equipment. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

Before Situation:

The legacy trail/roads are severely affecting wetland/riparian areas, slope stability, and water quality. The trail/roads can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and rehabilitation is the best way to address the resource concerns and problems that are being created.

After Situation:

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses.

Feature Measure: length

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,355.91

Scenario Cost/Unit: $2.71

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.	Hour	$56.37	4	$225.48
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	3	$13.17
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	1	$11.20
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
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.	Foot	$2.49	85	$211.65
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.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	1	$37.92
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario #2 - Road/Trail removal and restoration (Vegetative)

Scenario Description:

Minimal re-shaping to natural conditions using light equipment and the establishment of permanent vegetation. This scenario includes using smaller equipment (ag tractor/skid steer/small dozer/backhoe/) for the installation of water control devices such as water bars and rolling dips, controlling access, and pulling drainages on 500 feet of 12' wide road on 5%-35% hill slopes and little grade. The site is re-vegetated to permanent improved grass and temporarily protected with a thin layer of hay mulch. Soil amendments are applied as per the FOTG guidance. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Wildlife habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

Before Situation:

Legacy trail/road is not necessary and is affecting wetlands, riparian areas, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

After Situation:

The re-vegetated, eliminated road addressed the resource concern.

Feature Measure: length of landing/trail(s)

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,246.43

Scenario Cost/Unit: $2.49

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.	Hour	$44.85	1	$44.85
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	1	$11.20
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	1	$16.70
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	1	$10.69
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
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.	Foot	$2.49	100	$249.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	6	$123.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	2	$42.00
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	$0.57	15	$8.55
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	$0.48	10	$4.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	10	$3.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1	$32.76
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$130.50	1	$130.50
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	1	$37.92
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 655 - Forest Trails and Landings

Scenario #1 - Trail Layout

Scenario Description:

The use of professional assistance in trail design or redesign, location and layout. Installation costs are not included. Resource concerns include Concentrated flow erosion, and Excessive sediment in surface waters.

Before Situation:

Access to a forested tract is not available for the occasional travel by the landowner or manager for the purposes of monitoring or for the removal of forest products. Improperly designed and installed trails will cause soil erosion and water quality (sedimentation) problems. The trail will be installed as part a management operation such as timber harvesting and will not include extensive water control measures more common to access roads such as gravelling or ditching.

After Situation:

A trail system is designed and laid out that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

Feature Measure: Length of trail designed

Scenario Unit:: Foot

Scenario Typical Size: 5,280.0

Scenario Total Cost: $851.28

Scenario Cost/Unit: $0.16

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.	Hour	$106.41	8	$851.28

Practice: 655 - Forest Trails and Landings

Scenario #2 - Trail and Landing Installation

Scenario Description:

Construction of forest trails and landings for the purpose of providing access to a gently sloping forested tract, Access will allow the application of other conservation practices, monitoring and the removal of forest products. It is not, however, to be used if the installation is done as part of a commercial operation such as timber harvesting. In such a case, the Scenario 1 should be used. Installation will include removal of trees and brush as needed, a minimum amount of blading and soil disturbance, and the installing of water control measures such as water bars, broad-based dips, wing ditches, etc. It will not include measures more common to access roads such as gravelling or ditching. Installation will be supervised by a consultant forester, land manager, or other resource professional. Resource concerns include Excessive sediment in surface waters, Sheet & rill erosion, and Concentrated flow erosion

Before Situation:

Access to the tract is not available for occasional travel by the landowner or manager for the purposes of monitoring, installing conservation practices and/or the removal of forest products. Improperly installed trails and landings will cause soil erosion and water quality problems.

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:: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $2,315.35

Scenario Cost/Unit: $1.16

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.	Hour	$66.50	10	$665.00
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	8	$35.12
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
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.	Foot	$2.49	225	$560.25
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.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	10	$210.00
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 655 - Forest Trails and Landings

Scenario #3 - Trail Erosion Control w/o Vegetation, Slopes < 35%

Scenario Description:

Rehabilitation of existing forest access trail segments on a 20% slope and a 4% grade by addressing legacy resource issues for long-term use. Typically the trail is a single lane (18-foot wide, including cut and fill), seasonal prism requiring sustained erosion control measures installed by using heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages. This scenario includes designing and installing measures such as cross drains, rock drains, relief drains, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. Some hand work (chainsaw) will be needed to allow the use of the equipment. Installation 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 this practice scenario. Treatments are for long-term reduction of sediment, restoration of fish habitat, creation of fire access, and the removal of routes off unstable slopes. 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 areas and wetlands and possibly affecting T&E species. The system's usefulness for access is also being compromised by inadequate erosion and drainage control systems. However rehabilitation over abandonment is an acceptable course of action.

After Situation:

Trails and landings provide access and do not adversely affect the resources concerns.

Feature Measure: Length of trail treated

Scenario Unit:: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $6,640.97

Scenario Cost/Unit: $3.32

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.	Hour	$66.50	18	$1,197.00
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.	Hour	$114.38	18	$2,058.84
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	9	$39.51
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
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.	Foot	$2.49	250	$622.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	18	$371.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	36	$894.60
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.	Hour	$38.33	8	$306.64
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	$487.54	2	$975.08

Practice: 655 - Forest Trails and Landings

Scenario #4 - Trail Erosion Control w/o Vegetation, Slopes >35%

Scenario Description:

Rehabilitation of existing forest access trails and landings by addressing legacy resource issues such as sedimentation, for long-term use. Typically the trail is a single lane, existing 18-foot wide including cut and fill seasonal road prism on a moderately steep (45%) slope on forestland requiring sustained erosion control measures applied by using heavy equipment such as dozers, backhoes, graders, excavators, rock and rollers. The purpose is to hydrologically disconnect existing trail/landing system from the streams and natural drainages. This includes the design and installation of cross drains, rock drains, relief drains, out sloping (or changing road surface drainage), rolling dips and water bars and ditch outs as needed This scenario applies to only those segments of the trail system that have resource concerns requiring rehabilitation. A typical water bar or rolling dip installed in this scenario is on a 75 to 100 foot spacing. 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 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: Length of trail treated

Scenario Unit:: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $6,441.97

Scenario Cost/Unit: $12.88

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.	Hour	$124.72	16	$1,995.52
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$165.37	8	$1,322.96
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	9	$39.51
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
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.	Foot	$2.49	150	$373.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	28	$695.80
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.	Hour	$38.33	8	$306.64
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	$20.72	5	$103.60
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	$487.54	2	$975.08

Practice: 655 - Forest Trails and Landings

Scenario #5 - Grading and Shaping with Vegetative Establishment

Scenario Description:

Rehabilitation of existing forest access trails and landings on a medium slope by addressing rutting, erosion, and sedimentation. Typically the trail is a single, existing 18-foot wide (including cut and fill) seasonal road prism on gently sloping terrain requiring sustained erosion control measures applied with heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. This scenario includes designing and installation measures such as cross drains, rock drains, relief drainage, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. It also includes seedbed preparation, seeding to a perennial improved grass and soil amendments determined to be needed. Some hand work (chainsaw) will be needed to allow the use of the equipment. 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:: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $4,940.29

Scenario Cost/Unit: $2.47

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.	Hour	$56.37	16	$901.92
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	8	$35.12
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	1	$11.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.65	1	$6.65
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$10.69	1	$10.69
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	1	$12.67
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.	Foot	$2.49	300	$747.00
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hour	$165.28	10	$1,652.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	26	$546.00
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	$0.57	70	$39.90
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	$0.48	55	$26.40
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.36	40	$14.40
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$32.76	1	$32.76
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Introduced, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	$61.84	1	$61.84
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 655 - Forest Trails and Landings

Scenario #6 - Temporary Stream Crossing

Scenario Description:

The design and installation of a temporary stream crossing that will meet the immediate forest management/conservation needs. Afterwards the crossing will be restored and stabilized. Improperly designed and/or installed stream crossings will, in the long term, adversely affect water quality and aquatic life. Approaches will also be stabilized for the use of the crossing and stabilized afterwards as necessary. Installation will be supervised. Permanent and/or high-traffic crossings will be designed and installed according to the Stream Crossing (578) Standard. Resource concerns include: Excessive sediment in surface waters and Habitat degradation.

Before Situation:

Access to a forested tract is not available for the installation of conservation practices or removal of forest products due to the lack of a suitable stream crossing(s).

After Situation:

Access was available to address other resource concerns/management needs and the stream is restored to its previous or better condition.

Feature Measure: Number of crossings

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $980.38

Scenario Cost/Unit: $980.38

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.	Hour	$114.38	2	$228.76
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$44.85	2	$89.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
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.	Hour	$20.64	2	$41.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	2	$49.70
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 657 - Wetland Restoration

Scenario #5 - 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 tract size is 15 acres. 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 structure 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 conversion 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 macro topographic 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 Tract

Scenario Unit:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $7,115.83

Scenario Cost/Unit: $474.39

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 Yard	$2.03	3025	$6,140.75
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	$487.54	2	$975.08

Practice: 657 - Wetland Restoration

Scenario #6 - Crush Tile/Fill Ditch

Scenario Description:

This scenario involves crushing tile and/or plugging an open ditch to restore hydrology to a wetland. Exploratory ditches or holes are placed to determine locations. A parallel ditch is dug along side of unknown tile to determine depth, size, etc. Tile(s) are removed, crushed or otherwise disabled. Soil material is compacted in the areas of excavation. Vegetation is then established. Associated practices expected to be included are Conservation Cover (327), Mulching (484) and or other vegetative establishment. Typical size is 20 acres.

Before Situation:

An existing crop field was drained in the past either by an open ditch or tile drains or a combination of the two. This practice plugs existing ditches and crushes drain tile so as to restore wetland conditions and restore hydrologic conditions.

After Situation:

Tile drains are strategically crushed and/or ditches are plugged with fill from on-site sources. A herbaceous plant community will be 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: CY of material excavated

Scenario Unit:: Cubic Yard

Scenario Typical Size: 165.0

Scenario Total Cost: $764.15

Scenario Cost/Unit: $4.63

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 Yard	$1.68	180	$302.40
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.	Hour	$20.64	10	$206.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 657 - Wetland Restoration

Scenario #7 - Dike Breach, ditch fill and creation of surface macrofeatures

Scenario Description:

To restore 80 acre area back to a wetland requires three 50' long breaches within an existing 4' H, 8' top width, 1,100' L dike. In addition, 12 ditches are filled (40' L x 4' Wide x 1.25' Deep on average) at the discharge end of existing swales and compacted; Also install macrofeatures on 20 surface acres (0.5 deep) creating interconnected drainage ditches. This work allows for frequent inundation and restores the normal hydraulic regime. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

Before Situation:

The 80 acre farmed wetland has an existing 1,100'- 4' H, 8' top width dike which prevents frequent inundation of cropland and there are regularly spaced (100') shallow (1.5' Deep) surface drainage ditches. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach. and the ditches assure surface runoff and drainage of the area to provide for cropping of the area. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

After Situation:

Restoration of hydrology and plant community functions are improved for the water quality, soil condition improvement, and habitat for fish and wildlife. The hydrology of the site is restored with the levee breech and ditch plugs and the excavation of macro topographic features on 20 acres. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The dike has been breached at the upstream, center and downstream ends, restoring natural stream flooding to the area. The breach length averages 50 feet long per location with three completed. The disturbed areas are planted with hydrophilic vegetation using CAP (342). The levee breaches are protected by bioengineered methods using live stakes, fascines and bare root stock plantings using Streambank and Shoreline Protection (580). Facilitating practices include CAP (342), Streambank and Shoreline Protection (580), Structure for Water Control (587), Channel Bed Stabilization (584), Conservation Cover (327), Tree/Shrub Establishment (612), Wetland Enhancement (659) and Riparian Forest Cover (391) or Riparian Herbaceous Cover (390).

Feature Measure: CY of material excavated

Scenario Unit:: Cubic Yard

Scenario Typical Size: 16,666.0

Scenario Total Cost: $35,525.14

Scenario Cost/Unit: $2.13

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 Yard	$2.03	16666	$33,831.98
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	187	$718.08
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	$487.54	2	$975.08

Practice: 657 - Wetland Restoration

Scenario #9 - Fill shallow drainage ditches, no macro features

Scenario Description:

Restore the area back to a wetland by filling the downstream end and midway section of the 18 shallow ditches that have 4' Width, 2:1S. Fill material for ditch is created from existing 0.5' macro feature (1.1 surface area). This creates shallow pools of water where the ditch is left in tack thus removing the surface drainage and restoring hydraulic functions. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters, associated with farming of the area, as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

Before Situation:

The 40 acre farmed wetland has 18 shallow drainage ditches (4' bottom and 1.75' deep) which removes surface water and wetland hydrology allowing the area to be cropped at times. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

After Situation:

Restoration of hydrology and plant community functions are improved for the water quality, soil condition improvement, and habitat for fish and wildlife. The farmed wetland has filled 16 surface drainage ditches with 32-40' Long (center and end) of the shallow drainage ditches (16 SF/FT) of ditch section in addition a 1.1 surface area of macrofeatures and swales to connect upslope ditches is created. Some of the property has hydrophilic vegetation and by filling in the ditches, the wetland hydrology of the area will be completely restored. The disturbed areas are planted with hydrophilic vegetation using CAP (342) as needed. The levee breaches are protected by bioengineered methods using live stakes, fascines and bare root stock plantings using Streambank and Shoreline Protection (580). Facilitating practices include CAP (342), Streambank and Shoreline Protection (580), Structure for Water Control (587), Channel Bed Stabilization (584), Conservation Cover (327), Tree/Shrub Establishment (612), Wetland Enhancement (659) and Riparian Forest Cover (391) or Riparian Herbaceous Cover (390).

Feature Measure: CY Macro Feature Creation

Scenario Unit:: Cubic Yard

Scenario Typical Size: 887.0

Scenario Total Cost: $5,198.87

Scenario Cost/Unit: $5.86

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 Yard	$2.03	887	$1,800.61
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	758	$2,910.72
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	$487.54	1	$487.54

Practice: 658 - Wetland Creation

Scenario #1 - Wetland Creation, Wildlife Pond

Scenario Description:

A 10 acre 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. Associated practices may include (484) Mulching, (342) Critical Area Planting, (612) Tree and Shrub Establishment and (644) Wetland Wildlife Habitat Management.

Feature Measure: CY of created area

Scenario Unit:: Cubic Yard

Scenario Typical Size: 16,133.0

Scenario Total Cost: $34,605.39

Scenario Cost/Unit: $2.15

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 Yard	$2.03	16133	$32,749.99
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$195.23	4	$780.92
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	4	$99.40
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	$487.54	2	$975.08

Practice: 658 - Wetland Creation

Scenario #3 - Shallow Water Areas

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on all suitable lands. 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. The creation and establishment of a small pool for temporary to semi-permanent water during portions of the growing and non-growing season for wildlife that require shallow to moderately deep water for at least part of their life cycle. Typical settings are gentle to rolling terrain in agricultural settings. The typical size is 0.5 acres consisting of variable depths up to a maximum depth of depth 3'. Side slopes are 6:1 or flatter. Soils are somewhat poorly to moderately well drained. Ingress and egress as well as disturbance is typically sewn to an annual cover and mulched with clean straw and allowed to revegetate under natural conditions. Water is either ponded or managed by installation of a water control structure through a 3.0' berm, 8' top width, 4:1 SS min, 200 Lin. ft. low berm (444 CY), using on-site material (not included). Soils have low permeability or moderately well to poorly drained. Associated practices expected to be included are Critical Area Treatment (342) and Mulching (484) and (587) Structure for Water Control.

Before Situation:

Wildlife have access to moderately shallow water during the year. Water is typically not managed through regular manipulation; or managed and ponded behind a dike where a 18" dia. flashboard riser with a 12" CMP under 3.0' berm, 8' top width, 6:1 SS, 250 Lin. Ft. berm, using on-site material, for establishing shallow water habitat for wildlife that require shallow water for at least part of their life cycle. (Not included as part of this scenario)

After Situation:

Topography has been altered slightly to pond or inundate a relatively small area. Wildlife such as amphibians or reptiles and water is retained longer on the site providing habitat for at least part of their life cycle. Adjacent cover may be enhanced by supporting practices. 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.). Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: area of created pool

Scenario Unit:: Acre

Scenario Typical Size: 0.0

Scenario Total Cost: $1,834.55

Scenario Cost/Unit: #Div/0!

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 Yard	$3.84	150	$576.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	5	$623.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	5	$124.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: 659 - Wetland Enhancement

Scenario #3 - Riverine Levee Removal 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 size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. 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 structure 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 sidewall 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 macro topographic 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: Cubic yds of earth excavation/movi

Scenario Unit:: Cubic Yard

Scenario Typical Size: 16,520.0

Scenario Total Cost: $37,241.77

Scenario Cost/Unit: $2.25

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 Yard	$2.03	16520	$33,535.60
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$124.72	15	$1,870.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	15	$372.75
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	$487.54	3	$1,462.62

Practice: 659 - Wetland Enhancement

Scenario #4 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be enhanced. The tract size is 15 acres, and the actual 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 structure 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 land use, 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: Cubic yds of earth excavation

Scenario Unit:: Cubic Yard

Scenario Typical Size: 8,067.0

Scenario Total Cost: $17,692.85

Scenario Cost/Unit: $2.19

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 Yard	$2.03	8067	$16,376.01
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	$3.84	89	$341.76
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	$487.54	2	$975.08

Practice: 666 - Forest Stand Improvement

Scenario #1 - Pre-commercial Thinning - Hand tools

Scenario Description:

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a consultant forester and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The stocking of a stand of trees that are too small to make a commercial thinning exceeds the recommended fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increased susceptibility to insects and disease, and an unacceptable devastating wildfire risk.

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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,653.64

Scenario Cost/Unit: $265.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	48	$210.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	48	$990.72
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.	Hour	$106.41	12	$1,276.92

Practice: 666 - Forest Stand Improvement

Scenario #2 - Timber Stand Improvement - Single Stem Treatment

Scenario Description:

Altering the composition and stocking of a stand of trees by means of individual stem treatment. The trees to be retained are marked by a consultant forester. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The existing condition of the stand cannot meet the landowners objectives because the composition consists of unwanted species and the stocking exceeds the recommended level. The species and quality of the trees to be controlled makes a commercial operation unfeasible. Therefore the stand improvement will be carried out with single stem treatment such as injection or basal bark spraying.

After Situation:

The composition of the stand can meet the landowners objectives and the growth, condition and quality of the remaining trees is improved.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,889.24

Scenario Cost/Unit: $288.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	6	$131.46
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	10	$652.60
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.	Hour	$106.41	18	$1,915.38
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	10	$189.80

Practice: 666 - Forest Stand Improvement

Scenario #3 - Timber Stand Improvement - Chemical, Ground

Scenario Description:

Using ground applied chemicals to release young desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation:

An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application of appropriate herbicides according to label directions. Application will be by ground equipment as an over-the-top spray.

After Situation:

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $7,100.66

Scenario Cost/Unit: $177.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$117.59	40	$4,703.60
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.	Hour	$38.33	2	$76.66
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	40	$754.80
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.	Acre	$37.83	40	$1,513.20
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.	Acre	$1.31	40	$52.40

Practice: 666 - Forest Stand Improvement

Scenario #4 - Timber Stand Improvement - Chemical, Aerial

Scenario Description:

Using aerially applied chemicals to release desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation:

An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application of appropriate herbicides according to label directions. Application will be by helicopter as an over-the-top spray. The work will be professionally planned and supervised.

After Situation:

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Area treated

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,183.44

Scenario Cost/Unit: $79.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acre	$32.78	40	$1,311.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
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.	Acre	$37.83	40	$1,513.20
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.	Acre	$1.31	40	$52.40

Practice: 666 - Forest Stand Improvement

Scenario #5 - Competition Control - Mechanical, Light Equipment

Scenario Description:

Using light equipment such as a tractor with brush hog to control vegetation that is competing with desirable trees and species or to reduce the stocking level of a stand of desirable trees. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

A stand of young, desirable trees is adversely affected by competition either from undesirable species or because the stand is overstocked. The vegetation to be controlled is small enough that it can be mowed or shredded. The work can be done by mowing or shredding strips through the stand, mowing between planted rows, etc.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $378.25

Scenario Cost/Unit: $37.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$20.65	10	$206.50
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	$171.75	1	$171.75

Practice: 666 - Forest Stand Improvement

Scenario #6 - Competition Control - Mechanical, Heavy Equipment

Scenario Description:

Using equipment such as a masticator or mulcher to control vegetation that is competing with desirable trees and species or to reduce the stocking level of a stand of desirable trees. The trees to be retained will be marked by a consultant. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

A stand of desirable trees is adversely affected by competition either from undesirable species, cull trees, or because the stand is overstocked. The vegetation to be controlled is too large to be mowed or shredded. Therefore other mechanical methods such as using masticators or mulchers is necessary.

After Situation:

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Area treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,078.90

Scenario Cost/Unit: $507.89

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.	Hour	$86.58	30	$2,597.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	30	$630.00
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.	Hour	$106.41	15	$1,596.15
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: 666 - Forest Stand Improvement

Scenario #7 - Creating Patch Clearcuts

Scenario Description:

Creating 2 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $400.48

Scenario Cost/Unit: $200.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	16	$70.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24

Practice: 666 - Forest Stand Improvement

Scenario #8 - Forest Thinning for Wildlife and Health

Scenario Description:

A combination of hand and chemical treatments used to open the canopy of a stand to improve the wildlife habitat and tree health. Resource concerns include: Inadequate structure and composition, Undesirable plant productivity and health, and Habitat degradation.

Before Situation:

The stand of mature trees is overstocked resulting in a closed canopy. This condition is causing a lack of structure, herbaceous layer, and diversity that is needed to meet the landowner's objectives for improved wildlife habitat and forest health. Under the supervision of a consultant forester, it will be marked for thinning and timber stand improvement applications that will include cutting with hand tools (chainsaws) and injection. Costs involved in any commercial harvesting including marking, access, and transportation are not included in this scenario. However the costs involved in marking trees to be treated or left and supervising the TSI work is included.

After Situation:

The stand is treated to favor diversity of important commercial and wildlife species. The canopy is opened to the extent necessary to promote herbaceous growth and the work is performed without excessive damage to the residual trees and site.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,292.58

Scenario Cost/Unit: $329.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	16	$70.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	20	$1,305.20
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
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.	Hour	$20.64	16	$330.24
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.	Hour	$106.41	8	$851.28
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.	Acre	$7.07	10	$70.70
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$43.74	10	$437.40

Practice: 666 - Forest Stand Improvement

Scenario #41 - Timber Stand Improvement - Chemical, Hand treatment, no specialist required

Scenario Description:

Using hand applied chemicals to release young desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation:

An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application of appropriate herbicides according to label directions. Application will be by hand applied methods as a spot spray.

After Situation:

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Acres treated

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $5,084.12

Scenario Cost/Unit: $127.10

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.	Hour	$65.26	40	$2,610.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	40	$754.80
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.	Acre	$37.83	40	$1,513.20
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.	Acre	$1.31	40	$52.40

Practice: 666 - Forest Stand Improvement

Scenario #42 - Use of Consulting Forester to Oversee Commercial Timber Harvest to Create/Improve Cerulean Warbler/GWWA Habitat/Stand Structure

Scenario Description:

A consultant forester oversees a commercial timber harvest on privately owned lands taking into consideration the wildlife habitat goals and objectives of the client. The primary resource concerns are inadequate wildlife habitat and stand structure and composition to support desired cerulean warbler and/or golden-winged warbler populations. Silvicultural practices that will result in the desired future forest stand condition are used. Trees to be harvested are marked. The consultant forester oversees the harvesting of the trees including, but not limited to monitoring trees harvested, residual stand damage, and reclamation. Typical harvest size is 50 acres.

Before Situation:

The landowner sells timber to untrained individuals who have little or no knowledge of silviculture or wildlife habitat requirements. The wildlife habitat, stand structure and composition goals of the landowner are not considered resulting in inadequate wildlife habitat. The forest stand is left in a high graded state resulting with inadequate wildlife habitat and reduced plant productivity, health and vigor.

After Situation:

A trained consultant forester evaluates and marks the stand taking into consideration the client wildlife goals/objectives and accepted silvicultural techniques. Established guidelines for Cerulean Warbler and/or Golden-winged warbler habitat are followed. Trees to be harvested are marked and harvested according to Best Management Practices resulting in increased wildlife habitat, desired stand structure and composition, improved plant productivity, health and vigor.

Feature Measure: Acres Harvested

Scenario Unit:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $9,216.86

Scenario Cost/Unit: $184.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	16	$350.56
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.	Hour	$106.41	80	$8,512.80
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.	Acre	$7.07	50	$353.50

Practice: 666 - Forest Stand Improvement

Scenario #46 - Pre-Commercial FSI - Hand Tools - No Specialist Required

Scenario Description:

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a State Division of Forestry Forester at no cost to the landowner and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The stocking of a stand of trees that are too small to make a commercial thinning exceeds the recommended fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increased susceptibility to insects and disease, and an unacceptable devastating wildfire risk.

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: Acre

Scenario Unit:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,464.25

Scenario Cost/Unit: $146.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	50	$219.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	55	$1,135.20

Practice: 670 - Lighting System Improvement

Scenario #1 - Lighting - CFL bulbs

Scenario Description:

To install dimmable CFLs 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. CFL requirements: minimum 8 Watt, 4100 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketed 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 Compact Fluorescent Lamps (CFLs) in order to reduce energy use as evidenced by the energy audit. Associated practices/activities: 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.

Feature Measure: Each lamp replaced

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $17.30

Scenario Cost/Unit: $17.30

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.	Hour	$20.64	0.08	$1.65
Materials						
Lighting, bulb, CFL, 8 watt	1166	8 watt compact fluorescent lamp (CFL), typically 4100 Kelvin, dimmable, grow-out bulb, industrial grade, suitably protected from dirt accumulation. Materials only.	Each	$15.65	1	$15.65

Practice: 670 - Lighting System Improvement

Scenario #3 - Lighting - Linear Fluorescent fixtures

Scenario Description:

The lighting system consists of a four-foot, three-lamp fixture with a single electronic ballast. The high-efficiency lighting system uses high-efficiency 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.

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. Associated practices/activities: may include 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 fixture replaced

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $352.24

Scenario Cost/Unit: $352.24

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.	Hour	$26.89	0.75	$20.17
Materials						
Lighting, fixture, Fluorescent, 75 watt	1168	75 watt fluorescent lamp fixture with T5 or T8 lamps and ballast. Materials only.	Each	$332.07	1	$332.07

Practice: 670 - Lighting System Improvement

Scenario #4 - Lighting LED dusk to dawn lighting fixture

Scenario Description:

The lighting system consists of light-emitting diode (LED) fixtures (as detailed in ASABE S612-compliant energy audit). Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required

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. Associated practices/activities: may include 122-AgEMP - HQ and 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 fixture replaced

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,149.17

Scenario Cost/Unit: $1,149.17

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.	Hour	$20.64	0.75	$15.48
Materials						
Lighting, Flood, LED, 100 watt	2390	100 watt light emitting diode (LED) flood light and fixture, typically 5700 Kelvin bulb, 4,000 lumens; industrial grade with fixture; typically replaces 300 watt incandescent fixture; suitably protected from dirt accumulation. Materials only.	Each	$1,133.69	1	$1,133.69

Practice: 670 - Lighting System Improvement

Scenario #5 - Lighting - LED high bay lighting fixtures

Scenario Description:

The lighting system consists of light-emitting diode (LED) fixtures (as detailed in ASABE S612-compliant energy audit). Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required

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. Associated practices/activities: may include 122-AgEMP - HQ and 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 fixture replaced

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,950.94

Scenario Cost/Unit: $1,950.94

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.	Hour	$26.89	1	$26.89
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	1	$20.64
Materials						
Lighting, High Bay, LED, 250 watt	2389	250 watt light emitting diode (LED), typically 5000 Kelvin bulb, 20,000 lumens; industrial grade with fixture; typically replaces 400 watt mercury vapor fixture; suitably protected from dirt accumulation. Materials only.	Each	$1,903.41	1	$1,903.41

Practice: 670 - Lighting System Improvement

Scenario #6 - Lighting Linear LED lamp

Scenario Description:

The lighting system consists of light-emitting diode (LED) fixtures (as detailed in ASABE S612-compliant energy audit). Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required

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. Associated practices/activities: may include 122-AgEMP - HQ and 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 fixture replaced

Scenario Unit:: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $69.32

Scenario Cost/Unit: $69.32

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.	Hour	$20.64	0.17	$3.51
Materials						
Lighting, LED (Linear)	2417	LED low-energy lighting, often referred to as lighting strips. Materials and shipping only.	Each	$65.81	1	$65.81

Practice: 670 - Lighting System Improvement

Scenario #25 - Poultry House Lighting

Scenario Description:

To install dimmable Light Emitting diode lamps (LEDs) to replace less energy efficient lamps such as incandescent and compact fluorescent (CFL) on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 80 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, casketed 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: CAP 128-Agriculatural Energy Management Plan and CPS 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 lighting design meeting this standard.

Feature Measure: Area of Poultry House

Scenario Unit:: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $1,156.16

Scenario Cost/Unit: $0.06

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.	Hour	$20.64	14	$288.96
Materials						
Lighting, bulb, LED, 6 watt	1167	6 watt light emitting diode (LED), typically 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. Materials only.	Each	$10.84	80	$867.20

Practice: 672 - Building Envelope Improvement

Scenario #1 - Attic Insulation, Blown-In

Scenario Description:

Install a minimum R-7 insulation in addition to 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. Typical scenario assumes 2" of cellulose insulation will be added to the attic with typical dimensions 40'x500', thus yielding 3333 cubic feet.

Before Situation:

An agricultural facility 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, attic insulation. 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: Cubic Feet of Attic Insulated

Scenario Unit:: Cubic Foot

Scenario Typical Size: 3,333.0

Scenario Total Cost: $2,863.32

Scenario Cost/Unit: $0.86

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.	Hour	$20.64	16	$330.24
Materials						
Insulation material, cellulose	2272	Cellulose insulation. Unit is a measurement of the in-place volume after being blown. Includes materials only.	Cubic Foot	$0.76	3333	$2,533.08

Practice: 672 - Building Envelope Improvement

Scenario #2 - Building Envelope - Wall Insulation, Spray Foam

Scenario Description:

Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) 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). Based on a 40' x 400' poultry house.

Before Situation:

An agricultural facility 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. Associated practices/activities: may include 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: Area of Wall Insulated

Scenario Unit:: Square Foot

Scenario Typical Size: 5,770.0

Scenario Total Cost: $10,674.50

Scenario Cost/Unit: $1.85

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" thickness (R-7) with a protective sheeting barrier on lower 2 feet of wall height. Includes materials, equipment and labor to install.	Square Foot	$1.85	5770	$10,674.50

Practice: 672 - Building Envelope Improvement

Scenario #3 - Building Envelope - Wall Insulation, Batts

Scenario Description:

Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) 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). Based on a 40' x 400' poultry house.

Before Situation:

An agricultural facility 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. Associated practices/activities: may include 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: Area of Wall Insulated

Scenario Unit:: Square Foot

Scenario Typical Size: 5,770.0

Scenario Total Cost: $9,232.00

Scenario Cost/Unit: $1.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Insulation, Panel, R-11 with sheathing	1197	Insulated wall panel typically 3.5" fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install.	Square Foot	$1.60	5770	$9,232.00

Practice: 672 - Building Envelope Improvement

Scenario #5 - Building Envelope - thermal blankets, insulated curtains and screens for greenhouses

Scenario Description:

The mechanical energy screen system consists 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.

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. Associated practices/activities: may include 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: Area of Screen

Scenario Unit:: Square Foot

Scenario Typical Size: 25,000.0

Scenario Total Cost: $52,680.24

Scenario Cost/Unit: $2.11

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.	Hour	$26.89	16	$430.24
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 Foot	$2.09	25000	$52,250.00

Practice: 672 - Building Envelope Improvement

Scenario #6 - Insulated curtains and or sidewall curtains for poultry houses

Scenario Description:

The energy screen system consists of a 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 loss of heat during day, 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.

Before Situation:

Heating and cooling of an existing poultry house, 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 poultry house is fitted with an insulated curtain reducing heat loss in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ, 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: Area of Screen

Scenario Unit:: Square Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $869.12

Scenario Cost/Unit: $2.90

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.	Hour	$26.89	8	$215.12
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 Foot	$2.18	300	$654.00

Practice: 672 - Building Envelope Improvement

Scenario #7 - Greenhouse - Insulate Unglazed Walls

Scenario Description:

A typical scenario is the installation insulation in green house to address energy loss. The insulation can be either of the cellulose 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.

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. Associated practices/activities: may include 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: Square Feet of insulation

Scenario Unit:: Square Foot

Scenario Typical Size: 25,000.0

Scenario Total Cost: $7,930.24

Scenario Cost/Unit: $0.32

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.	Hour	$26.89	16	$430.24
Materials						
Insulation, Greenhouse, Reflective Bubble	2410	Double bubble reflective insulation with aluminum foil on both sides. Includes materials and shipping only.	Square Foot	$0.30	25000	$7,500.00

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:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $2,414.47

Scenario Cost/Unit: $804.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	10	$123.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$26.89	2	$53.78
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
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.	Hour	$106.41	2	$212.82
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78

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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	341	$190.96
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	340	$132.60
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: B000BFF2 - Buffer Bundle#2

Scenario #1 - Buffer Bundle#2

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:: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $2,414.47

Scenario Cost/Unit: $804.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	10	$123.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$26.89	2	$53.78
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
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.	Hour	$106.41	2	$212.82
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78

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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	341	$190.96
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	340	$132.60
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: B000CPL1 - Crop Bundle#1 - Precision Ag, No till

Scenario #1 - Crop Bundle#1 - Precision Ag, No till

Scenario Description:
?Addresses water quality degradation, air quality, and fish/wildlife inadequate habitat plus an option on soil erosion or soil quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,693.83

Scenario Cost/Unit: $36.94

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.	Acre	$9.91	100	$991.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	$10.73	100	$1,073.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.51	$201.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.45	$137.97
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.29	$43.17
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
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.	Hour	$106.41	8	$851.28
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: B000CPL2 - Crop Bundle#2 - Precision Ag, Reduced till

Scenario #1 - Crop Bundle#2 - Precision Ag, RT

Scenario Description:
?Addresses water quality degradation, air quality, and fish/wildlife inadequate habitat plus an option on soil erosion or soil quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,693.83

Scenario Cost/Unit: $36.94

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.	Acre	$9.91	100	$991.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	$10.73	100	$1,073.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.51	$201.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.45	$137.97
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.29	$43.17
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
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.	Hour	$106.41	8	$851.28
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35

Practice: B000CPL3 - Crop Bundle#3 - Soil health rotation, No till

Scenario #1 - Crop Bundle#3 - Soil health rotation, NT

Scenario Description:
Addresses soil quality degradation, insufficient water, water quality degradation, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,110.58

Scenario Cost/Unit: $41.11

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.	Acre	$9.91	100	$991.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	$10.73	100	$1,073.00
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.	Hour	$26.89	2	$53.78
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.	Hour	$106.41	13	$1,383.33
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

Practice: B000CPL4 - Crop Bundle#4 - Soil health rotation, Reduced till

Scenario #1 - Crop Bundle#4 - SH rotation, RT

Scenario Description:
?Addresses soil quality degradation, insufficient water, water quality degradation, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,110.58

Scenario Cost/Unit: $41.11

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.	Acre	$9.91	100	$991.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	$10.73	100	$1,073.00
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.	Hour	$26.89	2	$53.78
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.	Hour	$106.41	13	$1,383.33
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

Practice: B000CPL5 - Crop Bundle#5 - Soil Health Assessment, No till

Scenario #1 - Crop Bundle#5 - SH Assessment, NT

Scenario Description:
?Addresses soil quality degradation, insufficient water, water quality degradation, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,582.96

Scenario Cost/Unit: $45.83

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.	Acre	$9.91	100	$991.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	$10.73	100	$1,073.00
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.	Hour	$26.89	2	$53.78
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.	Hour	$106.41	16	$1,702.56
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	15	$153.15
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

Practice: B000CPL6 - Crop Bundle#6 - Soil Health Assessment, Reduced till

Scenario #1 - Crop Bundle#6 - SH Assessment, RT

Scenario Description:
?Addresses soil quality degradation, insufficient water, water quality degradation, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,582.96

Scenario Cost/Unit: $45.83

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.	Acre	$9.91	100	$991.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	$10.73	100	$1,073.00
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.	Hour	$26.89	2	$53.78
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.	Hour	$106.41	16	$1,702.56
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	15	$153.15
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

USDA - Natural Resources Conservation Service

Tennessee

Practice: B000CPL7 - Crop Bundle#7 - Soil Health -"Organic"

Scenario #1 - Crop Bundle#7 - Soil Health -"Organic"

Scenario Description:
Addresses soil quality degradation, water quality degradation, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,005.64

Scenario Cost/Unit: $40.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	10	$123.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$26.89	10	$268.90
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
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.	Hour	$106.41	2	$212.82
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.	Hour	$106.41	2	$212.82
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.	Hour	$106.41	3	$319.23

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.	Hour	$106.41	2	$212.82
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	341	$190.96
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	340	$132.60
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: B000CPL8 - Crop Bundle#8 - "Organic", Water erosion

Scenario #1 - Crop Bundle#8 - "Organic", Water erosion

Scenario Description:
Addresses soil erosion, soil quality degradation, and water quality degradation plus an option on 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,311.48

Scenario Cost/Unit: $33.11

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.	Hour	$26.89	1	$26.89
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.	Hour	$106.41	14	$1,489.74
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	15	$153.15
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40

USDA - Natural Resources Conservation Service

Tennessee

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 resource 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:: Acre

Scenario Typical Size: 111.0

Scenario Total Cost: $8,574.77

Scenario Cost/Unit: $77.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	45	$197.55
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	15	$328.65
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	41	$2,675.66
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	11	$135.96
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$26.89	7	$188.23
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	49	$1,011.36
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.	Hour	$106.41	12	$1,276.92
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.	Hour	$74.41	17	$1,264.97
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.	Acre	$7.07	20	$141.40
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87

Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	21	$398.58
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	605	$338.80
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	218	$85.02
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	$171.75	1	$171.75

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Tennessee

Practice: B000MRB1 - MRBI Bundle#1 - Irrigated Cropland

Scenario #1 - MRBI Bundle#1 - Irrigated Cropland

Scenario Description:
Addresses soil erosion, insufficient water, and water quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $6,013.44

Scenario Cost/Unit: $60.13

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.	Hour	$26.89	1	$26.89
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	20	$412.80
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.	Hour	$106.41	4	$425.64
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	$472.52	1	$472.52
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	$666.86	1	$666.86
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	$1,723.25	1	$1,723.25
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$292.95	1	$292.95
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$37.69	2	$75.38
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40
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	$1,088.24	1	$1,088.24
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$70.51	1	$70.51

Practice: B000MRB2 - MRBI Bundle#2 - Non-Irrigated Cropland #1

Scenario #1 - MRBI Bundle#2 - Non-Irrigated Crop#1

Scenario Description:
Addresses soil erosion, soil quality degradation, and water quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $892.85

Scenario Cost/Unit: $8.93

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.	Hour	$26.89	5	$134.45
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40

Practice: B000MRB3 - MRBI Bundle#3 - Non-Irrigated Cropland #2

Scenario #1 - MRBI Bundle#3 - Non-Irrigated Crop#2

Scenario Description:
Addresses soil erosion, soil quality degradation, and water quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,317.34

Scenario Cost/Unit: $13.17

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.	Hour	$26.89	1	$26.89
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.	Hour	$106.41	5	$532.05
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40

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Tennessee

Practice: B000MRB4 - MRBI Bundle#4 - Cropland with Water Bodies, No till

Scenario #1 - MRBI Bundle#4 - Crop w/ Water Bodies, NT

Scenario Description:
Addresses soil erosion, soil quality degradation, and water quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,895.18

Scenario Cost/Unit: $28.95

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.	Hour	$26.89	10	$268.90
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	1	$26.89
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.	Hour	$106.41	6	$638.46
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.	Hour	$106.41	3	$319.23
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40

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Tennessee

Practice: B000MRB5 - MRBI Bundle#5 - Cropland with Water Bodies, Reduced till

Scenario #1 - MRBI Bundle#5 - Crop w/ Water Bodies, RT

Scenario Description:
Addresses soil erosion, soil quality degradation, and water quality degradation

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,577.10

Scenario Cost/Unit: $25.77

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.	Hour	$26.89	10	$268.90
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	5	$134.45
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.	Hour	$106.41	2	$212.82
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.	Hour	$106.41	3	$319.23
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40

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Tennessee

Practice: B000MRB6 - MRBI Bundle#6 - Pastureland

Scenario #1 - MRBI Bundle#6 - Pastureland

Scenario Description:
Addresses soil quality degradation, water quality degradation, and fish/wildlife inadequate habitat plus an option on 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: Acre

Scenario Unit:: Acre

Scenario Typical Size: 101.0

Scenario Total Cost: $4,403.35

Scenario Cost/Unit: $43.60

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.	Hour	$7.35	5	$36.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	5	$124.55
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	25	$423.25
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.	Hour	$20.64	33	$681.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$72.51	4	$290.04
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	20	$127.60
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	8	$123.04
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.81	90	$612.90
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.17	1320	$224.40
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$169.37	2	$338.74
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	20	$958.00
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	$171.75	1	$171.75

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Tennessee

Practice: B000PST1 - Pasture Bundle#1 - Organic

Scenario #1 - Pasture Bundle#1 - Organic

Scenario Description:
Addresses water quality degradation, 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:: Acre

Scenario Typical Size: 111.0

Scenario Total Cost: $9,658.70

Scenario Cost/Unit: $87.02

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.	Hour	$7.35	5	$36.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	5	$124.55
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	30	$507.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	33	$681.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
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.	Hour	$106.41	4	$425.64
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.	Hour	$106.41	1	$106.41
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$72.51	4	$290.04
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	20	$127.60
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	8	$123.04
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.81	90	$612.90
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.17	1320	$224.40
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$169.37	2	$338.74
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10
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	$171.75	1	$171.75

Practice: B000PST2 - Pasture Bundle#2

Scenario #1 - Pasture Bundle#2

Scenario Description:
Addresses soil quality degradation, water quality degradation, and degraded plant condition plus an option on 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:: Acre

Scenario Typical Size: 210.0

Scenario Total Cost: $3,362.48

Scenario Cost/Unit: $16.01

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	2	$130.52
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	0	$0.00
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	1	$48.49
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
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	$0.42	2000	$840.00
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	3	$30.63
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	20	$958.00

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Tennessee

Practice: B000PST3 - Pasture Bundle#3 -- Soil Health

Scenario #1 - Pasture Bundle#3 -- Soil Health

Scenario Description:
Addresses soil quality degradation, water quality degradation, and degraded plant condition

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,690.03

Scenario Cost/Unit: $26.90

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	$65.00	1	$65.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	0	$0.00
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	25	$423.25
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.	Hour	$26.89	32	$860.48
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.	Hour	$38.33	2	$76.66
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	20	$958.00

Practice: B000PST4 - Pasture Bundle#4 - Monarch butterfly

Scenario #1 - Pasture Bundle#4 - Monarch butterfly

Scenario Description:
Addresses soil erosion, soil quality degradation, 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:: Acre

Scenario Typical Size: 200.0

Scenario Total Cost: $9,229.93

Scenario Cost/Unit: $46.15

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	$65.00	1	$65.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	0	$0.00
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	25	$423.25
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.	Hour	$20.64	10	$206.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	2	$212.82
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	1	$48.49
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E314133Z - Brush management for improved structure and composition

Scenario #1 - Brush mgmt, improved structure and comp

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,435.28

Scenario Cost/Unit: $14.35

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	$65.00	1	$65.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	12	$203.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	32	$860.48
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.	Hour	$38.33	8	$306.64

Practice: E314134Z - Brush management that maintains or enhances wildlife or fish habitat

Scenario #1 - Brush mgmt, enhance 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,435.28

Scenario Cost/Unit: $14.35

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	$65.00	1	$65.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	12	$203.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	32	$860.48
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.	Hour	$38.33	8	$306.64

Practice: E315132Z - Herbaceous weed control for desired plant communities/habitats consistent with the ecological site

Scenario #1 - Herbaceous weed control-habitats

Scenario Description:

Mechanical, chemical, or biological, herbaceous weed control 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $130.52

Scenario Cost/Unit: $13.05

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.	Hour	$65.26	2	$130.52

Practice: E315133Z - Herbaceous weed control (inadequate structure and comp) for desired plant communities/habitats

Scenario #1 - Herbaceous weed control-communities

Scenario Description:

Mechanical, chemical, or biological, herbaceous weed control 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $130.52

Scenario Cost/Unit: $13.05

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.	Hour	$65.26	2	$130.52

Practice: E315134Z - Herbaceous weed control (plant pest pressures) for desired plant communities/habitats

Scenario #1 - Herbaceous weed control-pest pressures

Scenario Description:

Mechanical, chemical, or biological, herbaceous weed control 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $130.52

Scenario Cost/Unit: $13.05

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.	Hour	$65.26	2	$130.52

Practice: E327136Z1 - Conservation cover to provide food habitat for pollinators and beneficial insects

Scenario #1 - Conservation cover-pollinator food

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $305.90

Scenario Cost/Unit: $305.90

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.	Hour	$26.89	2	$53.78
Materials						
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

Practice: E327136Z2 - Establish Monarch butterfly habitat

Scenario #1 - Establish monarch butterfly habitat

Scenario Description:

Seed or plug milkweed (Asclepias spp.), the Monarch butterfly larval hostplant, and high-value monarch butterfly nectar plants in non-cropped areas such as field borders, contour buffer strips, and associated grasslands.

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,354.88

Scenario Cost/Unit: $2,354.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	1	$52.20
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	2	$130.52
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	1	$106.41
Materials						
Highly Specialized native grass and forb mix	2618	A mix of native grass and forbs to be used for restoration of Monarch butterfly foraging and larva development habitat. Includes material and shipping only.	Acre	$1,981.35	1	$1,981.35

Practice: E327137Z - Conservation cover to provide cover and shelter habitat for pollinators and beneficial insects

Scenario #1 - Conservation cover-pollinator shelter

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $305.90

Scenario Cost/Unit: $305.90

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.	Hour	$26.89	2	$53.78
Materials						
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

Practice: E327139Z - Conservation cover to provide habitat continuity for pollinators and beneficial insects

Scenario #1 - Conservation cover-habitat continuity

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $305.90

Scenario Cost/Unit: $305.90

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.	Hour	$26.89	2	$53.78
Materials						
Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs	2346	Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	$252.12	1	$252.12

Practice: E328101I - Improved resource conserving crop rotation to reduce water erosion

Scenario #1 - IRCCR water erosion

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. Must enrich and 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E328101R - Resource conserving crop rotation to reduce water erosion

Scenario #1 - RCCR water erosion

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 plan 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,489.74

Scenario Cost/Unit: $14.90

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.	Hour	$106.41	14	$1,489.74

Practice: E328101Z - Conservation crop rotation on recently converted CRP grass/legume cover for water erosion

Scenario #1 - CRP trans crop rotation-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 than10 and reduces soil erosion from water to below soil tolerance (T) level. RUSLE2 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E328106I - Improved resource conserving crop rotation for soil organic matter improvement

Scenario #1 - IRCCR for SOM improvement

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. Must enrich and 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E328106R - Resource conserving crop rotation for soil organic matter improvement

Scenario #1 - RCCR for SOM improvement

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,489.74

Scenario Cost/Unit: $14.90

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.	Hour	$106.41	14	$1,489.74

Practice: E328106Z1 - 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) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E328106Z2 - Modifications to improve soil health and increase soil organic matter

Scenario #1 - Mod to improve SH and SOM

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) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,004.43

Scenario Cost/Unit: $10.04

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.	Hour	$106.41	8	$851.28
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	15	$153.15

Practice: E328106Z3 - Conservation crop rotation on recently converted CRP grass/legume cover for SOM improvement

Scenario #1 - CRP trans crop rotation-SOM

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. The crop rotation adds diversity to the system; keeps a living root growing; and is managed to minimize soil chemical, physical and biological disturbance and maintain residue cover on the surface. The rotation includes crops and/or cover crops representing 3 of the 4 crop types during the planned crop sequence: warm season grass (WSG), warm season broadleaf (WSB), cool season grass (CSG), or cool season broadleaf (CSB). The crop rotation will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the SCI. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than10 and reduces soil erosion from wind to below soil tolerance (T) level. RUSLE2 or WEPS must be used to document the rotation, STIR and SCI 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E328107I - Improved resource conserving crop rotation to improve soil compaction

Scenario #1 - IRCCR to improve soil compaction

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. Must enrich and 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E328107R - Resource conserving crop rotation to improve soil compaction

Scenario #1 - RCCR to improve soil compaction

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 plan 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,489.74

Scenario Cost/Unit: $14.90

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.	Hour	$106.41	14	$1,489.74

Practice: E328134I - Improved resource conserving crop rotation to relieve plant pest pressure

Scenario #1 - IRCCR to relieve plant pest pressure

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plan 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E328134R - Resource conserving crop rotation to relieve plant pest pressure

Scenario #1 - RCCR to relieve plant pest pressure

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 plan 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,489.74

Scenario Cost/Unit: $14.90

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.	Hour	$106.41	14	$1,489.74

Practice: E328136Z - Leave standing grain crops unharvested to benefit wildlife food sources

Scenario #1 - Leave standing grain crops for food

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $183.00

Scenario Cost/Unit: $4.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.17	$67.25
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.17	$52.12
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.17	$25.30
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.	Hour	$38.33	1	$38.33

Practice: E328137Z - Leave standing grain crops unharvested to benefit wildlife cover and shelter

Scenario #1 - Leave standing grain crops for shelter

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $183.00

Scenario Cost/Unit: $4.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.17	$67.25
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.17	$52.12
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.17	$25.30
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.	Hour	$38.33	1	$38.33

Practice: E329101Z - No till to reduce water erosion

Scenario #1 - No till to reduce water 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 erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. RUSLE2 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E329106Z - No till system to increase soil health and soil organic matter content

Scenario #1 - No till system to increase SH and SOM

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 20. 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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $425.64

Scenario Cost/Unit: $4.26

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.	Hour	$106.41	4	$425.64

Practice: E329114Z - No till to increase plant-available moisture: irrigation water

Scenario #1 - No till for IWM

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E329115Z - No till to increase plant-available moisture: moisture management

Scenario #1 - No till for moisture mgmt

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E329128Z - No till to reduce tillage induced particulate matter

Scenario #1 - No till to reduce PM

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E329144Z - 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $425.64

Scenario Cost/Unit: $4.26

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.	Hour	$106.41	4	$425.64

Practice: E338136Z - Short-interval burns to promote a healthy herbaceous plant community for wildlife food

Scenario #3 - Short-interval burns to promote a healthy herbaceous plant community for wildlife food

Scenario Description:

The controlled use of fire is applied in a forest to restore fire-adapted plants and forage 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. In order 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 forage quantity and quality, 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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,529.31

Scenario Cost/Unit: $88.23

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.	Hour	$66.50	8	$532.00
Truck, water	1448	Water tanker truck. Equipment only. Labor not included.	Hour	$164.44	8	$1,315.52
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.	Hour	$20.64	24	$495.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	8	$306.64
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.	Hour	$106.41	4	$425.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E338137Z1 - Sequential patch burning

Scenario #1 - Sequential patch burning

Scenario Description:

Prescribed burning to promote and enhance conifer forests and maintain a healthy understory. This enhancement is to conduct prescribed burns in a conifer forest, burning only a portion of the area each year to create a mosaic of vegetation in several stages of development, to provide a more diverse wildlife habitat.

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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,505.64

Scenario Cost/Unit: $150.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	2	$56.88
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	$2.44	2	$4.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	16	$430.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	3	$319.23
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	$4.39	5	$21.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: E338137Z2 - Short-interval burn

Scenario #1 - Short-interval burn

Scenario Description:

This enhancement is the controlled use of fire in a forest to restore native forest conditions with a focus on improving the condition of fire-adapted plants and wildlife habitat and reducing the risk of damage from intense, severe wildfires.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,050.62

Scenario Cost/Unit: $41.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	$2.44	8	$19.52
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.	Hour	$26.89	48	$1,290.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	$4.39	10	$43.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E338140Z - Short-interval prescribed burning to promote a healthy herbaceous plant community

Scenario #1 - Short-interval prescribed burning

Scenario Description:

?Increase the frequency of prescribed burning to help restore ecological conditions in forests and woodlands, with a focus on improving the condition of fire-adapted plants and forage while improving wildlife habitat and reducing the risk of damage from intense, severe wildfires. Short return-interval burns can also be effective in regenerating desirable native tree and herbaceous vegetation, and limiting the encroachment of competing vegetation including non-native species.

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,422.90

Scenario Cost/Unit: $85.57

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.	Hour	$66.50	8	$532.00
Truck, water	1448	Water tanker truck. Equipment only. Labor not included.	Hour	$164.44	8	$1,315.52
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.	Hour	$20.64	24	$495.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	8	$198.80
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.	Hour	$38.33	8	$306.64
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.	Hour	$106.41	3	$319.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E340101Z - Cover crop to reduce water erosion

Scenario #1 - Cover crop to reduce water erosion

Scenario Description:

Cover crop added to current crop rotation to reduce soil erosion from water 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $785.29

Scenario Cost/Unit: $7.85

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.	Hour	$26.89	1	$26.89
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	20	$758.40

Practice: E340106Z1 - Intensive cover cropping to increase soil health and soil organic matter content

Scenario #1 - Cover cropping for SH and SOM

Scenario Description:

Use of cover crops in a cropping system to add diversity, keep the soil covered, and maintain a living root as long as possible. Cover crop will be used during ALL non-crop production periods in an annual crop rotation. Cover crop may be a single species or multi-species mix. 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 and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. RUSLE2 or WEPS must be used to document SCI calculations. Cover crops may be grazed following a prescribed grazing plan that removes no more than 40% of the biomass produced.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,257.02

Scenario Cost/Unit: $12.57

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.	Hour	$106.41	2	$212.82
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	20	$1,044.20

Practice: E340106Z2 - Use of multi-species cover crops to improve soil health and increase soil organic matter

Scenario #1 - Multi-species cover crops

Scenario Description:

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increased 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,213.18

Scenario Cost/Unit: $12.13

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.	Hour	$26.89	2	$53.78
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	20	$1,159.40

Practice: E340106Z3 - Intensive cover cropping (orchard/vineyard floor) to increase soil health and SOM content

Scenario #1 - Cover cropping for orchards/vineyards

Scenario Description:

Implementation of cover crops to provide orchard or vineyard floor coverage throughout the year. Cover crop shall not be harvested, grazed, or burned. Planned cover crop management activities 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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,097.98

Scenario Cost/Unit: $10.98

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.	Hour	$26.89	2	$53.78
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	20	$1,044.20

Practice: E340106Z4 - Use of SHA to assist with development of cover crop mix to improve soil health and increase SOM

Scenario #1 - Soil health assessment

Scenario Description:

Use of a soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Soil health assessment results will be utilized to determine the correct Carbon to Nitrogen ratio of a multi-species cover crop mix that will be added to the crop rotation. During Year 3 a follow up assessment will be completed to allow time for the addition of a cover crop to increased soil organic matter.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,466.25

Scenario Cost/Unit: $14.66

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.	Hour	$26.89	1	$26.89
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.	Hour	$106.41	1	$106.41
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	15	$153.15
Three Species Mix, Warm Season, Annual Grasses and Legumes	2326	Warm season annual grass and legume mix. Includes material and shipping only.	Acre	$58.99	20	$1,179.80

Practice: E340107Z - 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,071.09

Scenario Cost/Unit: $10.71

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.	Hour	$26.89	1	$26.89
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	20	$1,044.20

Practice: E340118Z - Cover crop to reduce water quality degradation by utilizing excess soil nutrients-surface water

Scenario #1 - Cover crop for WQ nutrients-runoff

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,071.09

Scenario Cost/Unit: $10.71

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.	Hour	$26.89	1	$26.89
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	20	$1,044.20

Practice: E340119Z - Cover crop to reduce water quality degradation by utilizing excess soil nutrients-ground water

Scenario #1 - Cover crops for WQ nutrients-drainage

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,071.09

Scenario Cost/Unit: $10.71

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.	Hour	$26.89	1	$26.89
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	20	$1,044.20

Practice: E340134Z - Cover crop to suppress excessive weed pressures and break pest cycles

Scenario #1 - Cover crops for suppression

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,097.98

Scenario Cost/Unit: $10.98

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.	Hour	$26.89	2	$53.78
Materials						
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	$52.21	20	$1,044.20

Practice: E345101Z - Reduced tillage to reduce water erosion

Scenario #1 - Reduced tillage to reduce water erosion

Scenario Description:

Establish a reduced tillage 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 erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. RUSLE2 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $425.64

Scenario Cost/Unit: $4.26

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.	Hour	$106.41	4	$425.64

Practice: E345106Z - Reduced tillage to increase soil health and soil organic matter content

Scenario #1 - Reduced tillage for SH and SOM

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $425.64

Scenario Cost/Unit: $4.26

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.	Hour	$106.41	4	$425.64

Practice: E345114Z - Reduced tillage to increase plant-available moisture: irrigation water

Scenario #1 - Reduced tillage for IWM

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E345115Z - Reduced tillage to increase plant-available moisture: moisture management

Scenario #1 - Reduced tillage for moisture mgmt

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E345128Z - Reduced tillage to reduce tillage induced particulate matter

Scenario #1 - Reduced tillage to reduce PM

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. RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E345144Z - 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. RUSLE2 must be used to document STIR calculations and energy consumption. <State lists will be prepared providing conventional system benchmark energy values and reduced tillage system values for those systems using at least 25% less energy>

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $319.23

Scenario Cost/Unit: $3.19

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.	Hour	$106.41	3	$319.23

Practice: E374144Z1 - Install variable frequency drive(s) on pump(s)

Scenario #1 - Variable frequency drives

Scenario Description:
Install Variable Frequency Drive(s) (CPS 533 Pumping Plant) 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: $12,386.00

Scenario Cost/Unit: $247.72

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	$247.72	50	$12,386.00

USDA - Natural Resources Conservation Service

Tennessee

Practice: E374144Z2 - Switch fuel source for pump motor(s)

Scenario #1 - Switch fuel source for pump motor(s)

Scenario Description:

Switch fuel source for the pump motor(s) indicated in the 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: $39,503.70

Scenario Cost/Unit: $7,900.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	12	$322.68
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.	Hour	$106.41	2	$212.82
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 Includes material and shipping only.	Each	$564.23	1	$564.23
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	$424.66	5	$2,123.30
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	$472.52	5	$2,362.60
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	$8,474.04	4	$33,896.16

Practice: E381133Z - Silvopasture for wildlife habitat (structure and composition)

Scenario #1 - Silvopasture-structure and comp

Scenario Description:

Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage for livestock and the production of wood products, and including a purpose of enhancing wildlife habitat.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $8,561.86

Scenario Cost/Unit: $85.62

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.	Acre	$6.17	20	$123.40
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	200	$3,386.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	20	$377.40
Shrub, seedling or transplant, bare root, 36-60"	1508	Bare root shrubs 3 to 5 foot tall. Includes materials and shipping only.	Each	$1.67	200	$334.00
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	20	$4,264.40

Practice: E381137Z - Silvopasture for wildlife habitat (cover and shelter)

Scenario #1 - Silvopasture for wildlife habitat-food

Scenario Description:

Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage for livestock and the production of wood products, and including 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $8,918.10

Scenario Cost/Unit: $89.18

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.	Acre	$6.17	20	$123.40
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	200	$3,386.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
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.	Hour	$38.33	2	$76.66
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	20	$377.40
Shrub, seedling or transplant, bare root, 36-60"	1508	Bare root shrubs 3 to 5 foot tall. Includes materials and shipping only.	Each	$1.67	200	$334.00
Tree, conifer, seedling, bare root, 3-0	1515	Bare root conifer trees, 3-0 (3 years old). Includes materials and shipping only.	Each	$0.26	100	$26.00
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	20	$4,264.40

Practice: E382136Z - Incorporating "wildlife friendly" fencing for connectivity of wildlife food resources

Scenario #1 - Wildlife friendly fence for food access

Scenario Description:
Retrofitting or constructing fences that provide a means to control movement of animals, people, and vehicles, but minimizes wildlife movement impacts.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 382 - Fence

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 382 - Fence

Feature Measure: Acre

Scenario Unit:: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $148.44

Scenario Cost/Unit: $0.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	1	$28.44
Materials						
Vinyl Undersill Strips	241	Marking material using the "undersill" strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Foot	$0.06	2000	$120.00

Practice: E386101Z - Enhanced field borders to reduce water induced erosion along the edge(s) of a field

Scenario #1 - Field borders to reduce water erosion

Scenario Description:

Enhance existing field borders to a width of at least 30 feet and establish a single specie 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $666.70

Scenario Cost/Unit: $666.70

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E386106Z - Enhanced field borders to increase carbon storage along the edge(s) of the field

Scenario #1 - Field borders to increase carbon storage

Scenario Description:

Enhance existing field borders to a width of at least 30 feet and establish a single specie 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $666.70

Scenario Cost/Unit: $666.70

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E386128Z - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

Scenario #1 - Field borders to decrease particulates

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $666.70

Scenario Cost/Unit: $666.70

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E386136Z - Enhanced field border to provide wildlife food for pollinators along the edge(s) of a field

Scenario #1 - Field border to provide wildlife food

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $666.70

Scenario Cost/Unit: $666.70

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E386137Z - Enhanced field border to provide wildlife cover or shelter along the edge(s) of a field

Scenario #1 - Field border to provide wildlife cover

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 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $666.70

Scenario Cost/Unit: $666.70

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E386139Z - Enhanced field border to provide wildlife habitat continuity along the edge(s) of a field

Scenario #1 - Field border to provide continuity

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife habitat continuity 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $666.70

Scenario Cost/Unit: $666.70

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E390118Z - Increase riparian herbaceous cover width for nutrient reduction

Scenario #1 - Riparian herbaceous cover-nut 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 nutrient removal from surface and subsurface flows. Saturated buffer or nutrient control wetland to capture subsurface drainage.

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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,055.82

Scenario Cost/Unit: $527.91

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.	Acre	$6.17	2	$12.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.82	$324.36
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.72	$220.74
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Acre	$37.83	2	$75.66
One Species, Cool Season, Native Perennial Grass	2312	Native, cool season perennial grass. Includes material and shipping only.	Acre	$155.64	2	$311.28

Practice: E390126Z - Increase riparian herbaceous cover width to reduce sediment loading

Scenario #1 - Riparian herbaceous cover-seed loading

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 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,055.82

Scenario Cost/Unit: $527.91

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.	Acre	$6.17	2	$12.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.82	$324.36
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.72	$220.74
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Acre	$37.83	2	$75.66
One Species, Cool Season, Native Perennial Grass	2312	Native, cool season perennial grass. Includes material and shipping only.	Acre	$155.64	2	$311.28

Practice: E390136Z - Increase riparian herbaceous cover width to enhance wildlife habitat

Scenario #1 - Riparian herbaceous cover-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:: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $2,969.00

Scenario Cost/Unit: $742.25

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.	Acre	$6.17	4	$24.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	2	$42.96
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	1	$395.56
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	1	$306.59
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Acre	$37.83	4	$151.32
Specialized native grass and forb mix	2619	A mix of native grass and forbs to be used for specialized purposes such as wildlife (including pollinators) or ecosystem restoration, requiring species not readility available and/or difficult to produce and harvest. Includes material and shipping only	Acre	$989.71	2	$1,979.42

Practice: E391118Z - Increase riparian forest buffer width for nutrient reduction

Scenario #1 - Riparian forest buffer-nut 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 nutrient removal from surface and subsurface flows. Saturated buffer or nutrient control wetland to capture subsurface drainage.

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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,133.63

Scenario Cost/Unit: $1,566.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	16	$350.56
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2	$104.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	2	$12.34
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	16	$197.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.82	$324.36
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.72	$220.74
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Hour	$20.64	16	$330.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	872	$340.08
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00

Stakes, wood, 1" x 1" x 48"	1578	1" x 1" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$2.07	100	$207.00
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	$171.75	1	$171.75

USDA - Natural Resources Conservation Service

Tennessee

Practice: E391126Z - Increase riparian forest buffer width to reduce sediment loading

Scenario #1 - Riparian forest buffer-seed loading

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 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,174.91

Scenario Cost/Unit: $1,587.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	16	$350.56
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2	$104.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	2	$12.34
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	16	$197.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.82	$324.36
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.72	$220.74
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Hour	$20.64	18	$371.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	872	$340.08
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00

Stakes, wood, 1" x 1" x 48"	1578	1" x 1" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$2.07	100	$207.00
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	$171.75	1	$171.75

USDA - Natural Resources Conservation Service

Tennessee

Practice: E391127Z - Increase stream shading for stream temperature reduction

Scenario #1 - Shade stream to reduce temp

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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,174.91

Scenario Cost/Unit: $1,587.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	16	$350.56
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2	$104.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	2	$12.34
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	16	$197.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.82	$324.36
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.72	$220.74
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Hour	$20.64	18	$371.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	872	$340.08
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00
Stakes, wood, 1" x 1" x 48"	1578	1" x 1" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$2.07	100	$207.00

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	$171.75	1	$171.75

Practice: E391136Z - Increase riparian forest buffer width to enhance wildlife habitat

Scenario #1 - Riparian forest buffer-habitat

Scenario Description:

Where an existing forested riparian area 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) 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,174.91

Scenario Cost/Unit: $1,587.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	16	$350.56
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2	$104.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	2	$12.34
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	4	$99.64
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	16	$197.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.82	$324.36
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.72	$220.74
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.46	$68.47
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.	Hour	$20.64	18	$371.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	872	$340.08
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00

Stakes, wood, 1" x 1" x 48"	1578	1" x 1" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$2.07	100	$207.00
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	$171.75	1	$171.75

Practice: E393118Z - Extend existing filter strip to reduce excess nutrients in surface water

Scenario #1 - Extend filter strips- nut runoff

Scenario Description:

Extend existing filter strips for water quality protection (reduce excess nutrients in surface water). 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $879.52

Scenario Cost/Unit: $879.52

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$106.41	2	$212.82
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E393122Z - Extend existing filter strip to reduce excess pathogens and chemicals in surface water

Scenario #1 - Extend filter strips-pathogen runoff

Scenario Description:

Extend existing filter strips for water quality protection (reduce excess pathogens and chemicals from manure, bio-solids or compost applications in surface waters). 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $879.52

Scenario Cost/Unit: $879.52

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$106.41	2	$212.82
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E393126Z - Extend existing filter strip to reduce excess sediment in surface water

Scenario #1 - Extend filter strips-sediment

Scenario Description:

Extend existing filter strips for water quality protection (reduce excess sediment in surface waters). 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $879.52

Scenario Cost/Unit: $879.52

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.	Acre	$11.20	1	$11.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$7.74	1	$7.74
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
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.	Hour	$106.41	2	$212.82
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$57.97	1	$57.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: E395137X - Stream habitat improvement through placement of woody biomass

Scenario #1 - Stream habitat improvement with wood

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $20,784.37

Scenario Cost/Unit: $20,784.37

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.	Hour	$165.37	16	$2,645.92
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	8	$778.08
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.85	24	$596.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	$29.65	20	$593.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	$30.05	30	$901.50
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$41.44	1	$41.44
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$17.74	300	$5,322.00
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.95	40	$1,398.00
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.51	50	$25.50
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	15	$378.15
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$231.59	30	$6,947.70
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$9.08	20	$181.60
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	$487.54	2	$975.08

USDA - Natural Resources Conservation Service

Tennessee

Practice: E399137X - Fishpond management for native aquatic and terrestrial species

Scenario #1 - Fishpond mgmt

Scenario Description:

Pond rehabilitation (e.g., dredging), 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,486.53

Scenario Cost/Unit: $1,743.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	1	$21.48
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.	Hour	$26.89	3	$80.67
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
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.	Acre	$37.83	1	$37.83
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.	Gallon	$110.80	1	$110.80
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.32	1000	$1,320.00
Specialized native grass and forb mix	2619	A mix of native grass and forbs to be used for specialized purposes such as wildlife (including pollinators) or ecosystem restoration, requiring species not readility available and/or difficult to produce and harvest. Includes material and shipping only	Acre	$989.71	1	$989.71
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	$171.75	1	$171.75

Practice: E449114Z5 - Complete pumping plant evaluation for all existing pumps on a farm.

Scenario #2 - Pumping Plant Evaluation

Scenario Description:

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure to perform 10% more efficiently. 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:: Acre

Scenario Typical Size: 640.0

Scenario Total Cost: $3,690.75

Scenario Cost/Unit: $5.77

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.	Hour	$26.89	8	$215.12
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.	Hour	$106.41	32	$3,405.12
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	$70.51	1	$70.51

Practice: E449114Z6 - Automated Intermittent flood irrigation of rice fields, Year 2-5

Scenario #2 - Automated Intermittent flood irrigation of rice fields, Year 2-5

Scenario Description:

Rice fields are drained and allowed to “dry down” to a saturated soil condition prior to re-flooding the field. System is installed in year 1 with Scenario E449114Z8 and this scenario used in years 2-5.

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: Acre

Scenario Unit:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,055.58

Scenario Cost/Unit: $26.39

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.	Hour	$20.64	40	$825.60
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.	Hour	$38.33	6	$229.98

Practice: E449114Z7 - Advanced Automated IWM – Year 2-5, Soil moisture is monitored, recorded and used in decision making

Scenario #2 - Advanced Automated IWM – Year 2-5, soil moisture monitoring

Scenario Description:

Advanced automated irrigation water management using soil moisture monitoring (one sensor per 40 acres or less) with data loggers. Record keeping is such that a daily water balance is calculated and future irrigation is forecast. Equipment was bought in year one, this is monitoring for future years. Subscription service may be used as source for monitoring. System will be monitored and controlled using remote devices.

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:: Acre

Scenario Typical Size: 125.0

Scenario Total Cost: $1,995.52

Scenario Cost/Unit: $15.96

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.	Hour	$26.89	40	$1,075.60
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.	Hour	$38.33	24	$919.92

Practice: E449114Z8 - Advanced Automated IWM – Year 1 – Equipment and soil moisture is monitored, recorded and used in decision making

Scenario #2 - Advanced Automated IWM – Year 1 Equipment and soil moisture monitoring

Scenario Description:

Year 1 is used to purchase equipment to do advanced automated irrigation water management. System incuses field specific weather station data with soil moisture monitoring (one sensor station per 40 acres or less) data loggers and telemetry. Sensor stations will included minimum of 2 sensors per site at depths appropriate for the crop and soils. Equipment may include; weather station, sensors, flow meter, data loggers, as needed to monitor soil moisture, determine and forecast crop water use and remotely control irrigation system. Data to be monitored includes crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions. The installation includes the purchase and installation of equipment, and a data logger to log continuous weather data including rainfall, temp, solar radiation, humidity, wind speed and soil moisture sensors that can be downloaded to a personal computer and associated graphing software. Typical Scenario involves installation on a 120 acre field of irrigated cropland. Producer monitors the station during the growing season to determine timing and amounts of water to apply based on soil moisture sensors, field checks and weather station data. Producer keeps records of collected data and resulting irrigation decisions. This scenario only applies to year one of IWM. The appropriate labor-only IWM scenarios apply in subsequent contract 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:: Acre

Scenario Typical Size: 120.0

Scenario Total Cost: $6,723.41

Scenario Cost/Unit: $56.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	30	$657.30
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.	Hour	$26.89	8	$215.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16	$613.28
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.	Hour	$106.41	4	$425.64
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	$666.86	3	$2,000.58
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	$1,723.25	1	$1,723.25
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	$1,088.24	1	$1,088.24

Practice: E449144Z - Complete pumping plant evaluation for all pumps on a farm.

Scenario #1 - Pumping plant evaluation

Scenario Description:
Rehabilitate/replace/reconfigure all pumps that have the potential to perform 10% more efficiently as identified in the pump test.

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:: Acre

Scenario Typical Size: 640.0

Scenario Total Cost: $3,616.96

Scenario Cost/Unit: $5.65

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).	Hour	$91.91	35	$3,216.85
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$32.96	10	$329.60
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	$70.51	1	$70.51

USDA - Natural Resources Conservation Service

Tennessee

Practice: E472118Z - Manage livestock access to streams/ditches/other waterbodies to reduce nutrients in surface water

Scenario #1 - Livestock access to waterbody-nutrients

Scenario Description:

Installation of structures and implementation of grazing management actions that restrict livestock access to streams, ditches, and other waterbodies in order to reduce nutrient loading to surface waters.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 472 - Access Control

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 472 - Access Control

Feature Measure: (Stream length protected * 2) + ((C

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $2,945.44

Scenario Cost/Unit: $2.23

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.	Hour	$7.35	5	$36.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	5	$124.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	33	$681.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$72.51	4	$290.04
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	20	$127.60
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	8	$123.04
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.81	90	$612.90
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.17	1320	$224.40
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$169.37	2	$338.74
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	$171.75	1	$171.75

USDA - Natural Resources Conservation Service

Tennessee

Practice: E472122Z - Manage livestock access to streams/ditches/other waterbodies to reduce pathogens in surface water

Scenario #1 - Livestock access to waterbody-pathogens

Scenario Description:

Installation of structures and implementation of grazing management actions that restrict livestock access to streams, ditches, and other waterbodies in order to reduce the introduction of pathogens to surface waters.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 472 - Access Control

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 472 - Access Control

Feature Measure: (Stream length protected * 2) + ((C

Scenario Unit:: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $2,945.44

Scenario Cost/Unit: $2.23

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.	Hour	$7.35	5	$36.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	5	$109.55
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	5	$124.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	33	$681.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	5	$105.00
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$72.51	4	$290.04
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.38	20	$127.60
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$15.38	8	$123.04
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.81	90	$612.90
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.17	1320	$224.40
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$169.37	2	$338.74
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	$171.75	1	$171.75

Practice: E484106Z - 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 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) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). RUSLE2 or WEPS 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $212.82

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.	Hour	$106.41	2	$212.82

Practice: E511137Z1 - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Scenario #1 - Harvest using wildlife friendly methods

Scenario Description:

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. <species list 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $167.27

Scenario Cost/Unit: $3.35

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	$43.24	1.67	$72.21
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	2	$53.78
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28

Practice: E511137Z2 - Forage harvest management that helps maintain or improve wildlife habitat (cover and shelter)

Scenario #1 - FHM for cover and shelter

Scenario Description:

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such as way and time frames so as optimize both forage yield/quality and wildlife cover and shelter.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $461.58

Scenario Cost/Unit: $4.62

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	$16.93	25	$423.25
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.	Hour	$38.33	1	$38.33

Practice: E511139Z2 - Forage harvest management that helps maintain wildlife habitat continuity (space)

Scenario #1 - FHM for habitat space continuity

Scenario Description:

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such as way and time frames so as optimize both forage yield/quality and wildlife cover and shelter for habitat 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $167.27

Scenario Cost/Unit: $3.35

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	$43.24	1.67	$72.21
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$26.89	2	$53.78
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	2	$41.28

Practice: E512101Z1 - Cropland conversion to grass-based agriculture to reduce water erosion

Scenario #1 - Convert crop to grass for water erosion

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $489.86

Scenario Cost/Unit: $4.90

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.	Hour	$38.33	2	$76.66
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2319	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$20.66	20	$413.20

Practice: E512101Z2 - Forage and biomass planting for water erosion to improve soil health

Scenario #1 - Forage planting for SH

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,445.46

Scenario Cost/Unit: $14.45

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.	Hour	$38.33	2	$76.66
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	20	$1,368.80

Practice: E512106Z1 - Cropland conversion to grass-based agriculture for soil organic matter improvement

Scenario #1 - Convert crop to grass for SOM

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,424.92

Scenario Cost/Unit: $14.25

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.	Hour	$20.64	2	$41.28
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.	Hour	$106.41	4	$425.64
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	20	$958.00

Practice: E512106Z2 - Forage plantings that can help increase organic matter in depleted soils

Scenario #1 - Forage planting for SOM

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,457.91

Scenario Cost/Unit: $14.58

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	$16.93	25	$423.25
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.	Hour	$38.33	2	$76.66
Materials						
Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	$47.90	20	$958.00

Practice: E512132Z1 - Forage and biomass planting that produces feedstock for biofuels or energy production

Scenario #1 - Forage planting for feedstocks

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,634.82

Scenario Cost/Unit: $36.35

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.	Hour	$106.41	2	$212.82
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	50	$3,422.00

Practice: E512132Z2 - Native grasses or legumes in forage base to improve plant productivity and health

Scenario #1 - Native grasses/legumes-plant health

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,152.84

Scenario Cost/Unit: $21.53

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.	Hour	$20.64	1	$20.64
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: E512133Z1 - Native grasses or legumes in forage base to improve plant community structure and composition

Scenario #1 - Native grasses/legumes-structure/comp

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,543.32

Scenario Cost/Unit: $55.43

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.	Hour	$106.41	2	$212.82
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	25	$5,330.50

Practice: E512133Z2 - Forage plantings that enhance bird habitat (structure and composition)

Scenario #1 - Forage planting for structure/comp

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 components of 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $7,427.88

Scenario Cost/Unit: $74.28

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.	Hour	$26.89	2	$53.78
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	25	$1,711.00
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E512136Z1 - Establish pollinator and/or beneficial insect food habitat

Scenario #1 - Establish pollinator habitat-food

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,769.51

Scenario Cost/Unit: $57.70

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.	Hour	$106.41	1	$106.41
Materials						
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E512136Z2 - Native grass or legumes in forage base to provide wildlife food

Scenario #1 - Native grasses/legumes-wildlife food

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,769.51

Scenario Cost/Unit: $57.70

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.	Hour	$106.41	1	$106.41
Materials						
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E512137Z - Forage plantings that enhance bird habitat (cover and shelter)

Scenario #1 - Forage planting for cover and shelter

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 components of 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $7,427.88

Scenario Cost/Unit: $74.28

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.	Hour	$26.89	2	$53.78
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$68.44	25	$1,711.00
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E512138Z - Establish wildlife corridors to enhance access to water

Scenario #1 - Corridors for water access

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,632.11

Scenario Cost/Unit: $26.32

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	$16.93	25	$423.25
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.	Hour	$38.33	2	$76.66
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: E512139Z1 - Establish wildlife corridors to provide habitat continuity

Scenario #1 - Corridors for habitat continuity

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,516.30

Scenario Cost/Unit: $25.16

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.	Acre	$21.48	10	$214.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	10	$2,132.20

Practice: E512139Z2 - Establish pollinator and/or beneficial insect habitat continuity (space)

Scenario #1 - Establish pollinator habitat-space

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,875.92

Scenario Cost/Unit: $58.76

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.	Hour	$106.41	2	$212.82
Materials						
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E512139Z3 - Establish Monarch butterfly habitat in pastures

Scenario #1 - Establish Monarch Butterfly Habitat in pastures

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,875.92

Scenario Cost/Unit: $58.76

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.	Hour	$106.41	2	$212.82
Materials						
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	$566.31	10	$5,663.10

Practice: E512140Z - 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,407.16

Scenario Cost/Unit: $54.07

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.	Hour	$38.33	2	$76.66
Materials						
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	$213.22	25	$5,330.50

Practice: E528101Z - Improved grazing management for water erosion through monitoring activities

Scenario #1 - Grazing mgmt for water erosion

Scenario Description:

Three predominant key grazing areas are evaluated utilizing the Rangeland Health Assessment protocols to determine how well the ecological processes of the site(s) are functioning. Departure from reference categories will be determined, justified, and ratings described for soil and site stability, hydrologic function, and biotic integrity. Utilizing knowledge learned from this as a part of the ranch resource assessment, a Certified Range Management Consultant or Certified Professional in Range Management will provide recommendations or follow-up evaluations toward mitigating some of the degradation risks that are initially identified.

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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,929.16

Scenario Cost/Unit: $1.93

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	$65.00	1	$65.00
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
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.	Hour	$20.64	10	$206.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
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.	Hour	$106.41	12	$1,276.92

Practice: E528102Z - Improved grazing management for wind erosion through monitoring activities

Scenario #2 - Grazing mgmt for wind erosion

Scenario Description:

Three predominant key grazing areas are evaluated utilizing the Rangeland Health Assessment protocols to determine how well the ecological processes of the site(s) are functioning. Departure from reference categories will be determined, justified, and ratings described for soil and site stability, hydrologic function, and biotic integrity. Utilizing knowledge learned from this as a part of the ranch resource assessment, a Certified Range Management Consultant or Certified Professional in Range Management will provide recommendations or follow-up evaluations toward mitigating some of the degradation risks that are initially identified.

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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,929.16

Scenario Cost/Unit: $1.93

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	$65.00	1	$65.00
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
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.	Hour	$20.64	10	$206.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
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.	Hour	$106.41	12	$1,276.92

Practice: E528104Z - Grazing management that protects sensitive areas from gully erosion

Scenario #1 - Grazing mgmt-sensitive areas-erosion

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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,560.10

Scenario Cost/Unit: $1.56

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	12	$341.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	17	$350.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$51.00	1	$51.00
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528105Z - Prescribed grazing that improves or maintains riparian and watershed function-erosion

Scenario #1 - Prescribed grazing-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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $891.20

Scenario Cost/Unit: $8.91

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	$65.00	1	$65.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	1	$48.49
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35

Practice: E528107Z1 - Improved grazing management for soil compaction through monitoring activities

Scenario #1 - Grazing mgmt to improve compaction

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a Certified Forage and Grassland Professional, Certified Range Management Consultant, or Certified Professional in Range Management, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $754.16

Scenario Cost/Unit: $7.54

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	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	4	$82.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	4	$425.64

Practice: E528118Z1 - Prescribed grazing that maintains/improves riparian/watershed function impairment from nutrients

Scenario #1 - Prescribed grazing-nut runoff

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,472.14

Scenario Cost/Unit: $14.72

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	4	$193.96
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528119Z - Grazing management that protects sensitive areas-ground water from nutrients

Scenario #1 - Grazing mgmt-sensitive area-nut sub water

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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,713.10

Scenario Cost/Unit: $1.71

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	12	$341.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	17	$350.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$51.00	4	$204.00
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528122Z - Prescribed grazing that maintains/improves riparian/watershed function-pathogens/chemicals

Scenario #1 - Prescribed grazing-pathogens

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,472.14

Scenario Cost/Unit: $14.72

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	4	$193.96
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528126Z - Prescribed grazing that maintains/improves riparian/watershed function-min sediment in surface water

Scenario #1 - Prescribed grazing-sediment

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,302.84

Scenario Cost/Unit: $13.03

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
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.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	4	$193.96
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528132Z1 - Improved grazing mgmt for plant productivity/health through monitoring

Scenario #1 - Grazing mgmt-plant health

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a Certified Forage and Grassland Professional, Certified Range Management Consultant, or Certified Professional in Range Management, 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $943.75

Scenario Cost/Unit: $9.44

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	$16.93	30	$507.90
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.	Hour	$106.41	4	$425.64
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	1	$10.21

Practice: E528132Z2 - Stockpiling cool season forage to improve plant productivity and health

Scenario #1 - Stockpile cool season forage-plant prod

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,197.30

Scenario Cost/Unit: $21.97

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	1	$48.49
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
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	$0.42	2000	$840.00
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	3	$30.63

Practice: E528133Z1 - Stockpiling cool season forage to improve structure and composition.

Scenario #1 - Stockpile cool season forage-structure

Scenario Description:

Grazing management employed will 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,197.30

Scenario Cost/Unit: $21.97

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	10	$169.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	1	$48.49
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
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	$0.42	2000	$840.00
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	3	$30.63

Practice: E528133Z2 - Grazing management for improving quantity/quality of plant structure/composition for wildlife

Scenario #1 - Grazing mgmt-structure for wildlife

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving or maintaining 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $292.28

Scenario Cost/Unit: $2.92

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	$16.93	15	$253.95
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	1	$38.33

Practice: E528136Z1 - Grazing management for improving quantity and quality of food for wildlife

Scenario #1 - Grazing mgmt-food

Scenario Description:
Grazing management employed will provide plant structure, density and diversity needed 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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $448.30

Scenario Cost/Unit: $0.45

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	$65.00	1	$65.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	10	$383.30

Practice: E528137Z1 - Grazing management for improving quantity and quality of cover and shelter for wildlife

Scenario #1 - Grazing mgmt-shelter

Scenario Description:
Grazing management employed will provide plant structure, density and diversity needed 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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $448.30

Scenario Cost/Unit: $0.45

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	$65.00	1	$65.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	10	$383.30

Practice: E528137Z2 - Incorporating wildlife refuge areas in contingency plans for prescribed grazing-cover/shelter

Scenario #1 - Add wildlife refuge area-shelter

Scenario Description:

A prescribed grazing plan that includes 12 month (or longer) deferment of a pasture 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 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,556.79

Scenario Cost/Unit: $15.57

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	15	$253.95
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.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	4	$193.96
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528138Z - Incorporating wildlife refuge areas in contingency plans for prescribed grazing-water access

Scenario #1 - Add wildlife refuge area-water

Scenario Description:

A prescribed grazing plan that includes 12 month (or longer) deferment of a pasture 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 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,556.79

Scenario Cost/Unit: $15.57

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	6	$170.64
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	15	$253.95
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.	Hour	$20.64	8	$165.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	4	$193.96
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29

Practice: E528140Z1 - Maintaining quantity and quality of forage for animal health and productivity

Scenario #1 - Maintain forage quantity and quality

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..

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:: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $3,690.17

Scenario Cost/Unit: $3.69

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	$65.00	1	$65.00
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	4	$87.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	12	$341.28
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$16.93	36	$609.48
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.	Hour	$20.64	17	$350.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	12	$1,276.92
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only.	Each	$48.49	1	$48.49
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$325.35	1	$325.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$262.29	1	$262.29
Nutritional Balance Analyzer, fecal sample analysis only	1127	NIRS fecal analysis, animal performance report. Includes materials and shipping only.	Each	$41.03	6	$246.18

USDA - Natural Resources Conservation Service

Tennessee

Practice: E554118Z2 - Installation of a saturated buffer drain outlet

Scenario #1 - Installation of a vegetated outlet

Scenario Description:

Install Conservation Practice Standard 604, Saturated Buffer so all of the drain outlets on a field are routed through an appropriate buffer.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 554 - Drainage Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 554 - Drainage Water Management

Feature Measure: Acre

Scenario Unit:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3,534.20

Scenario Cost/Unit: $3,534.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.19	400	$476.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.37	4	$225.48
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.	Hour	$20.64	4	$82.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	4	$84.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	4	$153.32
Materials						
Pipe, HDPE, 5", PCPT, Single Wall	1271	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5" diameter - ASTM F405. Material cost only.	Foot	$0.72	400	$288.00
Water Level Control Structure, Inline, 2 Baffle, 10" diameter	2021	Inline Inlet WCS 6' High x 10" Dia.connections , 2 baffle (3 compartments)	Each	$1,969.49	1	$1,969.49
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

Practice: E554138X - Extend the periods of soil saturation or shallow ponding for wildlife

Scenario #1 - Extend saturation/ponding period

Scenario Description:

Extending the periods of wetness (soil saturation or shallow water), in excess of those required under National Conservation Practice Standard (NCP) Drainage Water Management (554), to meet the additional consideration of wildlife.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 554 - Drainage Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 554 - Drainage Water Management

Feature Measure: Acre

Scenario Unit:: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $198.41

Scenario Cost/Unit: $7.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	2	$56.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	5	$103.20
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.	Hour	$38.33	1	$38.33

USDA - Natural Resources Conservation Service

Tennessee

Practice: E578139X - 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: $7,515.10

Scenario Cost/Unit: $7,515.10

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.	Hour	$66.50	16	$1,064.00
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.	Hour	$114.38	8	$915.04
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$12.67	0.1	$1.27
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$97.26	16	$1,556.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	32	$660.48
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	32	$672.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	16	$613.28
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
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.48	300	$144.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$25.21	42	$1,058.82
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$37.92	0.1	$3.79
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$31.57	0.1	$3.16
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	$171.75	1	$171.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	1	$255.35

USDA - Natural Resources Conservation Service

Tennessee

Practice: E580105Z - Stream corridor bank stability improvement

Scenario #1 - Stream 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,620.24

Scenario Cost/Unit: $1,810.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
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.	Hour	$7.30	8	$58.40
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	8	$98.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	48	$990.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Materials						
Shrub, seedling or transplant, potted, 1/2 to 1 gal.	1526	Potted shrub, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.48	65	$291.20
Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal.	1531	Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.50	65	$292.50
Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal.	1536	Potted conifer, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.37	65	$284.05
Tree shelter, mesh tree tube, 48"	1556	48" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.11	65	$72.15
Tree shelter, solid tube type, 4" x 24"	1563	4" x 24" tree tube for protection from animal damage. Materials only.	Each	$2.23	65	$144.95
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	65	$274.30
Stakes, wood, 1" x 1" x 48"	1578	1" x 1" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$2.07	195	$403.65

USDA - Natural Resources Conservation Service

Tennessee

Practice: E580137Z - Stream corridor bank vegetation improvement

Scenario #1 - Stream corridor bank veg 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,620.24

Scenario Cost/Unit: $1,810.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	8	$227.52
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.	Hour	$7.30	8	$58.40
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	8	$98.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	48	$990.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	8	$306.64
Materials						
Shrub, seedling or transplant, potted, 1/2 to 1 gal.	1526	Potted shrub, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.48	65	$291.20
Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal.	1531	Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.50	65	$292.50
Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal.	1536	Potted conifer, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.37	65	$284.05
Tree shelter, mesh tree tube, 48"	1556	48" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.11	65	$72.15
Tree shelter, solid tube type, 4" x 24"	1563	4" x 24" tree tube for protection from animal damage. Materials only.	Each	$2.23	65	$144.95
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	$4.22	65	$274.30
Stakes, wood, 1" x 1" x 48"	1578	1" x 1" x 48" wood stakes to fasten items in place. Includes materials only.	Each	$2.07	195	$403.65

Practice: E590118X - Reduce risks of nutrient losses to surface water by utilizing precision ag technologies

Scenario #1 - Precision ag for nut reduction

Scenario Description:

Utilize precision application technology and techniques to reduce risk of nutrients in surface water by reducing total amount of applied and reducing the potential for delivery of nutrients into water bodies. Precision agriculture technology is 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,643.17

Scenario Cost/Unit: $16.43

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.	Acre	$10.73	100	$1,073.00
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.	Hour	$106.41	2	$212.82
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35

Practice: E590118Z - Improving nutrient uptake efficiency and reducing risk of nutrient losses to surface water

Scenario #1 - Nut mgmt for surface water

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.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,096.12

Scenario Cost/Unit: $10.96

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.	Hour	$106.41	2	$212.82
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30

Practice: E590119X - Reduce risks of nutrient losses to ground water by utilizing precision agriculture technologies to p

Scenario #2 - Prec Ag reduce nut in groundwater

Scenario Description:

Utilize precision application technology and techniques to reduce risk of nutrients in ground water by reducing total amount of applied and reducing the potential for delivery of nutrients into water bodies. Precision agriculture technology is 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,643.17

Scenario Cost/Unit: $16.43

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.	Acre	$10.73	100	$1,073.00
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.	Hour	$106.41	2	$212.82
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	35	$357.35

Practice: E590119Z - Improving nutrient uptake efficiency and reducing risk of nutrient losses to groundwater

Scenario #1 - Nut mgmt for groundwater

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.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,096.12

Scenario Cost/Unit: $10.96

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.	Hour	$106.41	2	$212.82
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30

Practice: E590130Z - Improving nutrient uptake efficiency and reducing risks to air quality - emissions of GHGs

Scenario #1 - Nut mgmt for GHGs

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 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,096.12

Scenario Cost/Unit: $10.96

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.	Hour	$106.41	2	$212.82
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acre	$8.19	100	$819.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.86	5	$64.30

Practice: E595116X - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Scenario #1 - Pest mgmt for surface water

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,310.23

Scenario Cost/Unit: $13.10

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.	Acre	$9.91	100	$991.00
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.	Hour	$106.41	3	$319.23

Practice: E595116Z - Reduce risk of pesticides in surface water by utilizing IPM PAMS techniques

Scenario #1 - IPM PAMS techniques

Scenario Description:

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in surface water 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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $588.13

Scenario Cost/Unit: $5.88

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.	Hour	$26.89	10	$268.90
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.	Hour	$106.41	3	$319.23

Practice: E595116Z2 - Reducing routine neonicotinoid seed treatments on corn and soybean crops.

Scenario #2 - Reducing routine seed treatments

Scenario Description:

Eliminate routine use of neonicotinoid seed treatments 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 that would impair water quality and fish and wildlife habitat.

Before Situation:

Resources are protected at the minimum level established in 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 the Conservation Practice Standard (CPS) 595 - Integrated Pest Management.

Feature Measure: Acre

Scenario Unit:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $532.05

Scenario Cost/Unit: $5.32

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.	Hour	$106.41	5	$532.05

Practice: E595129Z - Reduce ozone precursor emissions related to pesticides by utilizing IPM PAMS techniques

Scenario #1 - IPM PAMS techniques for ozone reduction

Scenario Description:

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce ozone precursor emissions related to pesticides.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $588.13

Scenario Cost/Unit: $5.88

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.	Hour	$26.89	10	$268.90
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.	Hour	$106.41	3	$319.23

Practice: E612126Z - Cropland conversion to trees or shrubs for long term improvement of water quality

Scenario #1 - Convert crop to trees-WQ

Scenario Description:

Conversion of cropped land to trees for long term erosion control and improvement of water quality. Trees 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) 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,519.00

Scenario Cost/Unit: $751.90

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.	Acre	$21.48	10	$214.80
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acre	$20.05	10	$200.50
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.73	500	$6,865.00
Four Species Mix, Cool Season, Introduced Perennial Grass	2318	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	$23.87	10	$238.70

Practice: E612130Z - Planting for high carbon sequestration rate

Scenario #1 - Planting for high carbon sequestration

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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,129.63

Scenario Cost/Unit: $712.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	6	$131.46
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	4	$24.68
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	6	$149.46
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$7.01	6	$42.06
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	4	$1,582.24
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	4	$1,226.36
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	2	$297.70
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.	Hour	$20.64	6	$123.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	6	$126.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	6	$229.98
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	4	$75.48
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.	Acre	$26.78	4	$107.12
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.	Acre	$1.31	3	$3.93
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	7260	$2,831.40
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	$171.75	1	$171.75

Practice: E612132Z - Establishing tree/shrub species to restore native plant communities

Scenario #1 - Tree/shrubs-restore native 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:: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $3,142.46

Scenario Cost/Unit: $628.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	12	$148.32
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.	Hour	$20.64	12	$247.68
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.	Hour	$74.41	4	$297.64
Materials						
Shrub, seedling or transplant, potted, 1/2 to 1 gal.	1526	Potted shrub, 1/2 to 1 gal. Includes materials and shipping only.	Each	$4.48	50	$224.00
Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal.	1532	Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only.	Each	$7.08	100	$708.00
Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal.	1537	Potted or balled and burlapped conifer tree, 2-3 gal. Includes materials and shipping only.	Each	$6.90	100	$690.00
Tree shelter, solid tube type, 4" x 60"	1567	4" x 60" tree tube for protection from animal damage. Materials only.	Each	$5.22	150	$783.00

Practice: E612133X1 - Adding food-producing trees and shrubs to existing plantings

Scenario #1 - Adding food-producing trees and shrubs

Scenario Description:

Plant food-producing trees and shrubs for wildlife or human consumption within windbreaks, alley cropping, multi-story cropping, or silvopasture systems, 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,513.45

Scenario Cost/Unit: $151.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	10	$284.40
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	10	$123.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	341	$190.96
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	340	$132.60
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	$171.75	1	$171.75

Practice: E612133X2 - 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, 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,171.08

Scenario Cost/Unit: $1,171.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
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.	Hour	$12.36	10	$123.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	10	$206.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	681	$265.59
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	$171.75	1	$171.75

Practice: E612136Z - 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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,190.56

Scenario Cost/Unit: $1,190.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
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.	Hour	$12.36	11	$135.96
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	11	$227.04
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	605	$338.80
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	218	$85.02

Practice: E612137Z - Tree/shrub planting for wildlife cover

Scenario #1 - Tree/shrub planting for wildlife cover

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:: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,190.56

Scenario Cost/Unit: $1,190.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	1	$6.17
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.	Hour	$12.36	11	$135.96
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.36	$110.37
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.23	$34.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	11	$227.04
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.87	1	$18.87
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.	Acre	$26.78	1	$26.78
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.	Acre	$1.31	1	$1.31
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.56	605	$338.80
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	$0.39	218	$85.02

USDA - Natural Resources Conservation Service

Tennessee

Practice: E643132X - Restoration of sensitive coastal vegetative communities

Scenario #1 - Restore sensitive coastal veg community

Scenario Description:

?Enhance the level of restoration in unique and diminishing coastal ecosystems by establishing native herbaceous and woody plants. Protect established vegetation, and manage to maintain floristic quality and the provision of environmental services.

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: Each

Scenario Unit:: Each

Scenario Typical Size: 25.0

Scenario Total Cost: $3,055.93

Scenario Cost/Unit: $122.24

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.	Hour	$44.85	8	$358.80
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$12.36	8	$98.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.33	2	$76.66
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.	Hour	$106.41	7	$744.87
Materials						
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.81	50	$340.50
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.	Acre	$7.07	5	$35.35
Cattle Panel	1409	Welded wire cattle panel typically 1/4" galvanized steel rods, 50" high x 16' long. Materials only.	Each	$21.28	25	$532.00
Tree, hardwood, seedling or transplant, potted or B&B, 5 gal.	1533	Potted or balled and burlapped hardwood tree, 5 gal. Includes materials and shipping only.	Each	$14.56	25	$364.00
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	$171.75	1	$171.75

USDA - Natural Resources Conservation Service

Tennessee

Practice: E643139X - Creating native plant refugia

Scenario #1 - Creating native plant refugia

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:: Foot

Scenario Typical Size: 440.0

Scenario Total Cost: $3,390.58

Scenario Cost/Unit: $7.71

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.	Hour	$7.35	8	$58.80
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	2	$8.78
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	8	$175.28
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$24.91	8	$199.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
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.	Hour	$106.41	2	$212.82
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	$261.88	3	$785.64
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	$27.48	38	$1,044.24
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.12	1648	$197.76
Gate, Game, 8' High X 4'	1082	4' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	$205.99	1	$205.99
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	$171.75	1	$171.75

Practice: E644136Z - Managing Flood-Irrigated Landscapes for Wildlife

Scenario #2 - Manage flood irrigated landscape for wildlife food

Scenario Description:

When flooded to shallow depths at the appropriate time of year, flood-irrigated cropland and pastureland provides foraging habitat for 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,183.32

Scenario Cost/Unit: $23.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05

Practice: E645137Z - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

Scenario #1 - Reduce human-subsidized predators

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:: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,265.59

Scenario Cost/Unit: $81.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	72	$1,577.52
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.	Hour	$7.30	72	$525.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	48	$990.72
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	$171.75	1	$171.75

Practice: E646136Z1 - Close structures to capture/retain rainfall to improve food for waterfowl/wading birds during winter

Scenario #1 - Close structures to improve food

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,313.82

Scenario Cost/Unit: $26.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05

Practice: E646136Z2 - Extend retention of rainfall to provide food for late winter habitat

Scenario #1 - Extend retention - food

Scenario Description:

When flooded to shallow depths during fall and retention of the captured rainfall is extended into late winter, agricultural fields provide maximum foraging habitat for myriad species of waterfowl and wading birds. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide high quality food for wildlife during a time when it may otherwise be in low abundance.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,546.61

Scenario Cost/Unit: $30.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46

Practice: E646136Z3 - Shorebird habitat, late season shallow water with manipulation to improve food sources

Scenario #1 - Late season shallow water - food

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,596.72

Scenario Cost/Unit: $51.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	4.5	$234.90
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05
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	$171.75	2	$343.50

Practice: E646136Z4 - Shorebird habitat, extended late season shallow water with manipulation to improve food sources

Scenario #1 - Extended late season shallow water-food

Scenario Description:

When flooded to shallow depths during fall and retention of the captured rainfall is extended into late winter, the 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. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide high quality food for wildlife during a time when it may otherwise be in low abundance. 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,881.71

Scenario Cost/Unit: $57.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	5.5	$287.10
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46
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	$171.75	2	$343.50

Practice: E646137X - Renovate small, shallow pothole and playa sites which may seasonally hold water

Scenario #1 - Shallow water development and management

Scenario Description:
Renovate small, shallow pothole and playa sites which may seasonally hold water.

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:: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $6,444.79

Scenario Cost/Unit: $1,611.20

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 Yard	$2.03	1613	$3,274.39
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$6.17	4	$24.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$21.48	3	$64.44
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	$395.56	0.41	$162.18
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	$306.59	0.23	$70.52
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	$148.85	0.36	$53.59
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.	Acre	$37.83	4	$151.32
Six Species Mix, Native Forb	2334	Native forb mix. Includes material and shipping only.	Acre	$952.01	2	$1,904.02
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	$252.12	1	$252.12
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	$487.54	1	$487.54

Practice: E646137Z1 - Close structures to capture and retain rainfall to improve cover and shelter for birds during winter

Scenario #1 - Close structures during winter.

Scenario Description:
When flooded to shallow depths during fall and winter, agricultural fields provide ideal cover and shelter for myriad species of 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,313.82

Scenario Cost/Unit: $26.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05

Practice: E646137Z2 - Extend retention of captured rainfall to provide enhanced cover and shelter for late winter habitat

Scenario #1 - Extend retention-cover and shelter

Scenario Description:

When flooded to shallow depths during the fall and retained into late winter, agricultural fields provide maximum shelter and cover for myriad species of waterfowl and wading birds. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide shelter and cover for waterfowl and shorebirds during a time when it may otherwise be in low abundance.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,546.61

Scenario Cost/Unit: $30.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46

Practice: E646137Z3 - Shorebird habitat, late season shallow water with manipulation to improve cover and shelter

Scenario #1 - Late season shallow water - cover

Scenario Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Improved 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,596.72

Scenario Cost/Unit: $51.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	4.5	$234.90
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05
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	$171.75	2	$343.50

Practice: E646137Z4 - Extended late season shallow water with manipulation to improve cover and shelter

Scenario #1 - Extended late season shallow water-cover

Scenario Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide shelter and cover for waterfowl and shorebirds during a time when it may otherwise be in low abundance. Optimal conditions are created when water levels are slowly reduced and 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,881.71

Scenario Cost/Unit: $57.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	5.5	$287.10
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46
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	$171.75	2	$343.50

Practice: E646138Z1 - Close structures to capture and retain rainfall to provide water for birds during winter

Scenario #1 - Close structures to provide water

Scenario Description:
When flooded to shallow depths during fall and winter, agricultural fields provide water essential for myriad species of 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,313.82

Scenario Cost/Unit: $26.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05

Practice: E646138Z2 - Extend retention of captured rainfall to provide late winter water habitat

Scenario #1 - Extend winter water habitat

Scenario Description:

When flooded to shallow depths during fall and winter, agricultural fields provide water essential for myriad species of waterfowl and wading birds. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide water for shorebirds and waterfowl during a time when it may otherwise be in low abundance.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,546.61

Scenario Cost/Unit: $30.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46

Practice: E646138Z3 - Shorebird habitat, late season shallow water with manipulation

Scenario #1 - Late season shallow water

Scenario Description:

Suitable water is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Improved conditions are created when water levels are slowly reduced through evaporation. Manipulation of vegetation, preferably through rolling, creates open water 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,596.72

Scenario Cost/Unit: $51.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	4.5	$234.90
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05
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	$171.75	2	$343.50

Practice: E646138Z4 - Shorebird habitat, extended late season shallow water with manipulation

Scenario #1 - Extended late season shallow water

Scenario Description:

Suitable water is limited during the summer and fall as birds migrate south post-breeding. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide habitat during a time when it may otherwise be in low abundance. Optimal conditions are created when water levels are slowly reduced and manipulation of vegetation, preferably through rolling, creates open water 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,881.71

Scenario Cost/Unit: $57.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	5.5	$287.10
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46
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	$171.75	2	$343.50

Practice: E646139Z1 - Close structures to capture and retain rainfall for birds to improve habitat continuity

Scenario #1 - Close structures - habitat continuity

Scenario Description:

When flooded to shallow depths during fall and winter, agricultural fields provide habitat for myriad species of migratory birds. Those flooded conditions promote a network or continuity of habitat that is available to migratory waterfowl, shorebirds, 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,313.82

Scenario Cost/Unit: $26.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05

Practice: E646139Z2 - Extend retention of captured rainfall to provide habitat continuity during late winter

Scenario #1 - Extend retention - habitat continuity

Scenario Description:

When flooded to shallow depths during the fall and retained into late winter, agricultural fields provide habitat for myriad species of migratory birds. Agriculture fields are typically drained in preparation of spring planting, but retention of water into late winter will provide a network or continuity of habitat for waterfowl, wading birds, and shorebirds during a time when it may otherwise be in low abundance.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,546.61

Scenario Cost/Unit: $30.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	2.5	$130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46

Practice: E646139Z3 - Shorebird habitat, late season shallow water with manipulation to enhance habitat continuity

Scenario #1 - Late season shallow water-continuity

Scenario Description:

Suitable water is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Improved conditions are created when water levels are slowly reduced through evaporation. Manipulation of vegetation, preferably through rolling, creates open water 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,596.72

Scenario Cost/Unit: $51.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	9	$197.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	4.5	$234.90
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	22	$454.08
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.	Hour	$106.41	5	$532.05
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	$171.75	2	$343.50

Practice: E646139Z4 - Shorebird habitat, extended late season shallow water with manipulation - habitat continuity

Scenario #1 - Extended late season water-continuity

Scenario Description:

Suitable water is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water with manipulation of vegetation creates a network or continuity of habitat required by this suite of migratory birds during a time when it may otherwise be in low abundance.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,881.71

Scenario Cost/Unit: $57.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	11	$241.01
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	5.5	$287.10
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$16.70	50	$835.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	26	$536.64
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.	Hour	$106.41	6	$638.46
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	$171.75	2	$343.50

Practice: E647136Z1 - Manipulate vegetation on fields where rainfall is to be captured and retained-food

Scenario #1 - Manipulate veg for food

Scenario Description:

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units. When flooded to shallow depths during fall and winter, these 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. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,142.86

Scenario Cost/Unit: $22.86

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.	Hour	$58.02	8	$464.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: E647136Z2 - Provide early successional habitat between first rice crop and ratoon crop-food

Scenario #1 - Ratoon crop food sources

Scenario Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,142.86

Scenario Cost/Unit: $22.86

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.	Hour	$58.02	8	$464.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: E647136Z3 - Establish and maintenance of moist soil vegetation on cropland edges to increase wildlife food

Scenario #1 - Moist soil vegetation-food

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $563.10

Scenario Cost/Unit: $11.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	3	$156.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
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	$171.75	2	$343.50

Practice: E647137Z1 - Manipulate vegetation on fields where rainfall is to be captured and retained-cover/shelter

Scenario #1 - Manipulate veg for cover/shelter

Scenario Description:

This enhancement is to provide cover and shelter for wildlife by retaining some standing rice stubble and by encouraging the establishment of early successional, naturally occurring vegetation in fields post harvest. Allowing some standing rice stubble and naturally occurring vegetation to develop will help provide food and cover for wildlife while enhancing aquatic habitat and improving 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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,142.86

Scenario Cost/Unit: $22.86

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.	Hour	$58.02	8	$464.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$255.35	2	$510.70

Practice: E647137Z2 - Establish and maintenance of moist soil vegetation on cropland edges to increase cover/shelter

Scenario #1 - Moist soil vegetation-cover/shelter

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $563.10

Scenario Cost/Unit: $11.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	3	$156.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
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	$171.75	2	$343.50

Practice: E647139Z1 - Establish/maintain habitat continuity, naturally occurring vegetation in ditches/ditch bank borders

Scenario #1 - Naturally occurring veg in ditches

Scenario Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $563.10

Scenario Cost/Unit: $11.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$52.20	3	$156.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	3	$63.00
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	$171.75	2	$343.50

Practice: E666106Z2 - Maintaining and improving forest soil quality

Scenario #1 - Maintain/improve forest SQ

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,101.91

Scenario Cost/Unit: $42.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	4	$17.56
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	4	$113.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
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.	Hour	$106.41	13	$1,383.33
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	10	$102.10
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.	Acre	$7.07	5	$35.35
Certified Organic, Three plus Species Mix, Cool Season, Annual Grasses and Legumes	2343	Certified organic cool season annual grass and legume mix. Includes material and shipping only.	Acre	$80.29	3	$240.87

Practice: E666107Z - Maintaining and improving forest soil quality by limiting compaction

Scenario #1 - Maintain/improve forest compaction

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:: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,101.91

Scenario Cost/Unit: $42.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	4	$17.56
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	4	$113.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	8	$165.12
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.	Hour	$106.41	13	$1,383.33
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$10.21	10	$102.10
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.	Acre	$7.07	5	$35.35
Certified Organic, Three plus Species Mix, Cool Season, Annual Grasses and Legumes	2343	Certified organic cool season annual grass and legume mix. Includes material and shipping only.	Acre	$80.29	3	$240.87

Practice: E666115Z2 - Enhance development of the forest understory to improve site moisture

Scenario #1 - Forest understory to improve moisture

Scenario Description:

?Forest stand improvement to manage the structure and composition of overstory and understory vegetation so that additional moisture is captured and filtered through the vegetation and soil. Managing the understory vegetation will increase available water to the plants, minimize run-off and erosion, and improve water quality.

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,864.30

Scenario Cost/Unit: $243.22

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.	Hour	$86.58	16	$1,385.28
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	16	$1,044.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666118Z - Enhance development of the forest understory to capture nutrients in surface water

Scenario #1 - Understory-nutrients in surface water

Scenario Description:

?Forest stand improvement to manage the structure and composition of overstory and understory vegetation so that additional moisture is captured and filtered through the vegetation and soil, thus minimizing nutrient movement in surface water. Managing the understory vegetation will increase available water to the plants, minimize run-off and erosion, and improve water quality.

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,864.30

Scenario Cost/Unit: $243.22

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.	Hour	$86.58	16	$1,385.28
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	16	$1,044.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666119Z - Enhance development of the forest understory to capture nutrients -ground water

Scenario #1 - Understory-nutrients in ground water

Scenario Description:

?Forest stand improvement to manage the structure and composition of overstory and understory vegetation so that additional moisture is captured and filtered through the vegetation and soil, thus minimizing nutrient loss through ground water. Managing the understory vegetation will increase available water to the plants, minimize run-off and erosion, and improve water quality.

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,864.30

Scenario Cost/Unit: $243.22

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.	Hour	$86.58	16	$1,385.28
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	16	$1,044.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666130Z - Increase on-site carbon storage

Scenario #1 - Increase on-site carbon storage

Scenario Description:

Utilize forest management techniques to increase on-site carbon storage, including uneven-aged management, longer rotations, leave-tree retention, snags and down woody debris, and soil organic matter.

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:: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,383.33

Scenario Cost/Unit: $13.83

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.	Hour	$106.41	13	$1,383.33

USDA - Natural Resources Conservation Service

Tennessee

Practice: E666132Z1 - 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,500.49

Scenario Cost/Unit: $350.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	25	$109.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	6	$131.46
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	25	$1,631.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	25	$516.00
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.	Hour	$106.41	8	$851.28
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.	Acre	$7.07	10	$70.70
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	10	$189.80

Practice: E666132Z2 - Reduce forest stand density to improve a degraded plant community

Scenario #1 - Forest density-degraded plant community

Scenario Description:

?Open pine or conifer management reduces the number of trees per acre while still maintaining the stand as forest land. It restores elements of stand structure that were formerly created by fire on sites where it is not currently feasible to conduct prescribed burning at the intensity needed to open the canopy. The open stand condition allows a significant amount of sunlight to reach the forest floor and stimulate understory vegetation. The initial treatment creates a stand structure that allows prescribed burning to be applied to limit redevelopment of the woody component of the understory and maintain open conditions. The vegetation management, and wide spacing between trees or clumps of trees, provides visual appeal, reduces the risk of wildfire, and provides wildlife habitat for many at-risk and listed 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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $5,555.66

Scenario Cost/Unit: $277.78

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.	Hour	$86.58	20	$1,731.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	20	$1,305.20
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	20	$420.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666133X - Forest Stand Improvement to rehabilitate degraded hardwood stands

Scenario #1 - FSI-structure/composition in hardwoods

Scenario Description:

?Mixed species hardwood stands have been subjected 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). A professional forester is needed to recognize and mark crop trees to be retained and delineate areas without crop trees to be clear-cut. Thinning and forest stand improvement will include cutting with hand tools (chainsaws) and injection. Costs involved in any commercial harvesting including marking, access, and transportation are not included in this scenario. However the costs involved in marking trees to be treated or left and supervising the TSI work is included.

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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,040.87

Scenario Cost/Unit: $504.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	16	$70.24
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	40	$2,610.40
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$28.44	16	$455.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	16	$330.24
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.	Hour	$106.41	8	$851.28
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.	Acre	$7.07	10	$70.70
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$43.74	10	$437.40
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	$171.75	1	$171.75

Practice: E666133Z1 - Creating structural diversity with patch openings

Scenario #1 - Structural diversity with patch openings

Scenario Description:

Forest stand improvement that creates patch openings. Size and shape of patches will be based on characteristic natural wind disturbances, which will vary geographically and by forest type.

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:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $7,275.45

Scenario Cost/Unit: $485.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	150	$658.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	15	$328.65
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.	Hour	$20.64	150	$3,096.00
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.	Hour	$106.41	30	$3,192.30

Practice: E666134Z - Enhance development of the forest understory to create conditions resistant to pests

Scenario #1 - Forest understory-resistant to pests

Scenario Description:

?Forest stand improvement that manages the structure and composition of over story and understory vegetation to reduce vulnerability to damage by insects and diseases of forest trees. Managing the understory vegetation will also reduce the risk of wildfire, and promote development of herbaceous plants that benefit wildlife.

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,864.30

Scenario Cost/Unit: $243.22

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.	Hour	$86.58	16	$1,385.28
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	16	$1,044.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666135Z1 - Reduce height of the forest understory to limit wildfire risk

Scenario #1 - Forest understory-limit wildfire risk

Scenario Description:

?Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy.

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,864.30

Scenario Cost/Unit: $243.22

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.	Hour	$86.58	16	$1,385.28
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	16	$1,044.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666135Z2 - Reduce forest density and manage understory along roads to limit wildfire risk

Scenario #1 - Manage understory-limit wildfire risk

Scenario Description:

Opening the tree canopy along roads ("daylighting"), and providing space between ground vegetation and tree crowns, minimizes the spread of wildfires that often start along roads. Additionally, opening the canopy will allow more sunlight to reach the forest floor and promote flowering plants, and will reduce maintenance needs by allowing moisture to evaporate from roads.

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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,812.54

Scenario Cost/Unit: $281.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	8	$35.12
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	$86.58	8	$692.64
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	8	$522.08
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.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
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.	Hour	$106.41	8	$851.28
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.	Acre	$37.83	10	$378.30

Practice: E666136Z1 - Reduce forest density and manage understory along roads to improve wildlife food sources

Scenario #1 - Manage understory-wildlife food sources

Scenario Description:

Opening the tree canopy along roads ("daylighting") allows more sunlight to reach the forest floor and promotes the growth of herbaceous plants. The resulting condition is more visually appealing for users of the roadway, and improves wildlife habitat and food sources for many 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,812.54

Scenario Cost/Unit: $281.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	8	$35.12
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	$86.58	8	$692.64
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	8	$522.08
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.	Hour	$20.64	8	$165.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	8	$168.00
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.	Hour	$106.41	8	$851.28
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.	Acre	$37.83	10	$378.30

Practice: E666136Z2 - Reduce forest stand density to improve wildlife food sources

Scenario #1 - Stand density-wildlife food sources

Scenario Description:

?Open pine or conifer management reduces the number of trees per acre while still maintaining the stand as forest land. It restores elements of wildlife habitat that formerly resulted from fire, on sites where it is not currently feasible to conduct prescribed burning. The open stand condition allows a significant amount of sunlight to reach the forest floor and stimulate understory vegetation. The initial treatment creates a stand structure that allows prescribed burning to be applied, where feasible, to limit redevelopment of the woody component of the understory and maintain open conditions. The vegetation management, and wide spacing between trees or clumps of trees, provides visual appeal, reduces the risk of wildfire, and provides wildlife habitat for many at-risk and listed 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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $5,555.66

Scenario Cost/Unit: $277.78

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.	Hour	$86.58	20	$1,731.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	20	$1,305.20
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	20	$420.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75

Practice: E666136Z3 - Create patch openings to enhance wildlife food sources and availability

Scenario #1 - Patch openings-food and availability

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. The treatment will create diversity in stand composition and structure, and enhance wildlife food availability.

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:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $4,437.03

Scenario Cost/Unit: $295.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	120	$526.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	12	$262.92
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.	Hour	$20.64	120	$2,476.80
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.	Hour	$106.41	11	$1,170.51

Practice: E666137Z1 - Snags, den trees, and coarse woody debris for wildlife habitat

Scenario #1 - Snags and den trees for wildlife

Scenario Description:
Create and retain 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $455.63

Scenario Cost/Unit: $45.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	7	$30.73
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	1	$21.91
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	3	$195.78
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.	Hour	$26.89	7	$188.23
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	1	$18.98

USDA - Natural Resources Conservation Service

Tennessee

Practice: E666137Z2 - Summer roosting habitat for native forest-dwelling bat species

Scenario #1 - Summer roosting habitat for bats

Scenario Description:

Creates 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:: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,991.37

Scenario Cost/Unit: $199.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	13	$57.07
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	6	$131.46
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	13	$848.38
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.	Hour	$20.64	13	$268.32
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.	Hour	$106.41	4	$425.64
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.	Acre	$7.07	10	$70.70
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$18.98	10	$189.80

Practice: E666137Z3 - Increase diversity in pine plantation monocultures

Scenario #1 - Improve pine plantation diversity

Scenario Description:

Creates 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 harvesting, 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:: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $970.06

Scenario Cost/Unit: $485.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	20	$87.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	2	$43.82
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.64	20	$412.80
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.	Hour	$106.41	4	$425.64

Practice: E666137Z6 - Create patch openings to enhance wildlife cover and shelter

Scenario #1 - Patch openings-cover and shelter

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. The treatment will create diversity in stand composition and structure, and enhance the availability of wildlife food and cover.

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:: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $4,437.03

Scenario Cost/Unit: $295.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$4.39	120	$526.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$21.91	12	$262.92
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.	Hour	$20.64	120	$2,476.80
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.	Hour	$106.41	11	$1,170.51

Practice: E666137Z7 - Enhance development of the forest understory to provide wildlife cover and shelter

Scenario #1 - Understory to provide cover/shelter

Scenario Description:

?Forest stand improvement that manages the structure and composition of over story and understory vegetation to improve the quantity and quality of wildlife cover and shelter. Reducing the number of trees per acre provides canopy openings that allow sunlight to reach the forest floor and promote the growth of herbaceous plants, improving wildlife shelter and cover in the forest understory. The treatment also creates conditions that facilitate the use of prescribed burning as a follow-up practice to maintain wildlife shelter and cover.

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:: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $4,864.30

Scenario Cost/Unit: $243.22

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.	Hour	$86.58	16	$1,385.28
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$65.26	16	$1,044.16
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$21.00	16	$336.00
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.	Hour	$106.41	11	$1,170.51
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.	Acre	$37.83	20	$756.60
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	$171.75	1	$171.75