

**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; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; and 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.

**Scenario Feature Measure:** Linear Feet of Streambank/Shoreline Protected

**Scenario Unit:** Foot

**Scenario Typical Size:** 1000

**Total Scenario Cost:** \$14,045.32

**Scenario Cost/Unit:** \$14.05

**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       | \$58.85 | 16   | \$941.53   |
| 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 | \$1.97  | 2500 | \$4,925.90 |
| Fertilizer, ground application, dry bulk             | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.                               | Acre       | \$6.11  | 0.46 | \$2.81     |
| Lime application                                     | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs.  | Acre       | \$9.29  | 0.46 | \$4.27     |
| Seeding Operation, Broadcast, Ground                 | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acre       | \$11.23 | 0.46 | \$5.17     |
| Tillage, Primary                                     | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.  | Acre       | \$14.78 | 0.46 | \$6.80     |

**Labor**

|                            |     |  |      |         |     |            |
|----------------------------|-----|--|------|---------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$22.70 | 16  | \$363.22   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$22.04 | 224 | \$4,937.66 |
| 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 | \$39.85 | 56  | \$2,231.49 |

**Mobilization**

|                                |      |  |      |          |   |          |
|--------------------------------|------|--|------|----------|---|----------|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each | \$227.64 | 2 | \$455.29 |
| 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 | \$153.11 | 1 | \$153.11 |

**Materials**

|  |      |  |      |         |      |         |
|--|------|--|------|---------|------|---------|
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | \$39.29 | 0.46 | \$18.08 |
|--|------|--|------|---------|------|---------|

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #2 - Bioengineered

**Scenario Description:** Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestock, rootwads 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; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; and 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.

**Scenario Feature Measure:** Linear Feet of Streambank/Shoreline Protected

**Scenario Unit:** Foot

**Scenario Typical Size:** 1000

**Total Scenario Cost:** \$41,499.96

**Scenario Cost/Unit:** \$41.50

**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       | \$58.85  | 16   | \$941.53    |
| Earthfill, Roller Compacted                          | 49  | Earthfill, roller or machine compacted, includes equipment and labor   | Cubic Yard | \$3.72   | 2500 | \$9,309.30  |
| 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 | \$1.97   | 2500 | \$4,925.90  |
| Fertilizer, ground application, dry bulk             | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.                               | Acre       | \$6.11   | 0.46 | \$2.81      |
| 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       | \$146.34 | 75   | \$10,975.16 |
| Lime application                                     | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs.  | Acre       | \$9.29   | 0.46 | \$4.27      |
| Seeding Operation, Broadcast, Ground                 | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acre       | \$11.23  | 0.46 | \$5.17      |
| Tillage, Primary                                     | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.  | Acre       | \$14.78  | 0.46 | \$6.80      |

**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 | \$27.99 | 75  | \$2,098.90 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$22.70 | 16  | \$363.22   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$22.04 | 370 | \$8,155.96 |
| Supervisor or Manager      | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.                                     | Hour | \$39.85 | 80  | \$3,187.84 |

#### Mobilization

|                                |      |  |      |          |   |          |
|--------------------------------|------|--|------|----------|---|----------|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each | \$227.64 | 3 | \$682.93 |
| 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 | \$153.11 | 1 | \$153.11 |

#### Materials

|  |      |  |      |         |      |          |
|--|------|--|------|---------|------|----------|
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only.             | Acre | \$39.29 | 0.46 | \$18.08  |
| Tree, willow                                     | 1426 | Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only. | Each | \$0.67  | 1000 | \$668.99 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #4 - Structural, Site Specific

**Scenario Description:** Protection of actively eroding 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. Depending on site conditions, protection is extended from the streambank toe to 80% of the top bank height, or all the way to the top bank if overland flow or field runoff creates a need for such protection. 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 15-foot high bank at 2(H):1(V) slope for 125 linear feet is used for estimation purposes. The rock will be keyed in 2' below the streambed at the toe. The rock will extend 80% of the slope distance up the bank, or 12 feet high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; and 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.

**Scenario Feature Measure:** Cubic Yards of riprap

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 306

**Total Scenario Cost:** \$60,689.71

**Scenario Cost/Unit:** \$198.33

**Cost Details**

| Component Name | Id | Description | Unit | Cost | Qty | Total |
|----------------|----|-------------|------|------|-----|-------|
|----------------|----|-------------|------|------|-----|-------|

**Materials**

|  |      |   |            |          |      |             |
|--|------|---|------------|----------|------|-------------|
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only.                            | Acre       | \$39.29  | 0.46 | \$18.08     |
| Rock Riprap, Placed with geotextile              | 44   | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | \$130.53 | 306  | \$39,940.88 |

**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       | \$58.85  | 16   | \$941.53   |
| Earthfill, Roller Compacted                               | 49   | Earthfill, roller or machine compacted, includes equipment and labor   | Cubic Yard | \$3.72   | 890  | \$3,314.11 |
| 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 | \$3.84   | 890  | \$3,420.66 |
| Fertilizer, ground application, dry bulk                  | 950  | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.   | Acre       | \$6.11   | 0.46 | \$2.81     |
| 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       | \$101.21 | 16   | \$1,619.42 |
| Lime application  | 953  | Lime application performed by ground equipment. Includes equipment, power unit and labor costs.  | Acre       | \$9.29   | 0.46 | \$4.27     |
| Seeding Operation, Broadcast, Ground                      | 959  | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.             | Acre       | \$11.23  | 0.08 | \$0.90     |
| Tillage, Primary  | 946  | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.  | Acre       | \$14.78  | 0.46 | \$6.80     |

**Labor**

|                            |     |  |      |         |     |            |
|----------------------------|-----|--|------|---------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$22.70 | 16  | \$363.22   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$22.04 | 320 | \$7,053.80 |
| 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 | \$39.85 | 80  | \$3,187.84 |

**Mobilization**

|                                |      |  |      |          |   |          |
|--------------------------------|------|--|------|----------|---|----------|
| Mobilization, large equipment  | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$434.63 | 1 | \$434.63 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each | \$227.64 | 1 | \$227.64 |
| 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 | \$153.11 | 1 | \$153.11 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario:** #5 - Vegetative with Willow Staking

**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, staking of willow cuttings, 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) where the lower 3 feet are staked with willows is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; and 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 with little hydraulic roughness near the toe 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 stabilized against further erosion by the roots of planted willows and encourages natural sediment transport and deposition. The stream bank's toe is further stabilized by the addition of hydraulic roughness, via growing brushy vegetation, at the toe of the slope. 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.

**Scenario Feature Measure:** Linear Feet of Streambank/Shoreline Protected

**Scenario Unit:** Foot

**Scenario Typical Size:** 1000

**Total Scenario Cost:** \$19,440.91

**Scenario Cost/Unit:** \$19.44

**Cost Details**

| Component Name | Id | Description | Unit | Cost | Qty | Total |
|----------------|----|-------------|------|------|-----|-------|
|----------------|----|-------------|------|------|-----|-------|

**Labor**

|                            |     |  |      |         |     |            |
|----------------------------|-----|--|------|---------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$22.70 | 16  | \$363.22   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$22.04 | 234 | \$5,158.09 |
| Supervisor or Manager      | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.                                     | Hour | \$39.85 | 56  | \$2,231.49 |

**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       | \$58.85 | 16   | \$941.53   |
| 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 | \$3.84  | 2500 | \$9,608.60 |
| Fertilizer, ground application, dry bulk                  | 950  | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.   | Acre       | \$6.11  | 0.46 | \$2.81     |
| Lime application  | 953  | Lime application performed by ground equipment. Includes equipment, power unit and labor costs.  | Acre       | \$9.29  | 0.46 | \$4.27     |
| Seeding Operation, Broadcast, Ground                      | 959  | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.             | Acre       | \$11.23 | 0.46 | \$5.17     |
| Tillage, Primary  | 946  | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.  | Acre       | \$14.78 | 0.46 | \$6.80     |

**Mobilization**

|                                |      |  |      |          |   |          |
|--------------------------------|------|--|------|----------|---|----------|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each | \$227.64 | 2 | \$455.29 |
| 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 | \$153.11 | 1 | \$153.11 |

**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 | \$0.49  | 1000 | \$492.46 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only.  | Acre | \$39.29 | 0.46 | \$18.08  |