Practice: 338 - Prescribed Burning

Scenario: #2 - Forest Site Preparation

Scenario Description:

Treating areas to encourage natural seeding or to permit reforestation by planting or direct seeding. Burning is utilized to eliminate existing competition and debris, reduce forest fuel and to prepare the site for planting or seeding. Burning a cutover site helps prepare the site for replanting. Burn should expose a portions of bare soil for planting. Objectives of a site preparation burn may dictate timing and burn intensity. Firebreaks are not included in the cost of the site prep. burn, see Firebreaks (394) for firebreak construction. Resource concerns include: Plants productivity, health and vigor, Air Quality- smoke, Plant adaptability to the site.

Before Situation:

Area to be burned has had a portion of the over story removed. Slash, brush and grasses dominate the site. This is forestry site preparation.

After Situation:

Area to be planted has been burned to remove grass, reduce competing brush and remove downed slash leftover from forestry activities either scattered or pushed into windrows or piles. Some bare ground is temporarily exposed improving the site for planting.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 80

Scenario Cost: $3,312.96 **Scenario Cost/Unit:** $41.41

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$41.42	1	$41.42
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	$55.12	12	$661.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$30.49	10	$304.90
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$25.19	10	$251.90
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hour	$16.43	10	$164.30
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	$2.12	10	$21.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.97	40	$998.80
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	$17.83	20	$356.60
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	$35.96	10	$359.60
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	$3.82	40	$152.80

Practice: 338 - Prescribed Burning

Scenario: #3 - Rangeland -Level Terrain, Herbaceous Fuel

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of less than 640 acres and applies under the following conditions: where the terrain of the majority of the area to be burned <15% slopes with herbaceous and/or low volatile woody fuel with no high volatile fuels. 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)

Before Situation:

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

After Situation:

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

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 320

Scenario Cost: $2,140.96 **Scenario Cost/Unit:** $6.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$41.42	1	$41.42
Equipment/Installation						
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	$2.12	8	$16.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$30.49	8	$243.92
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hour	$16.43	8	$131.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$25.19	8	$201.52
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	$24.97	32	$799.04
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	16	$285.28
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	$35.96	8	$287.68
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	$3.82	35	$133.70

Practice: 338 - Prescribed Burning

Scenario: #6 - Rangeland -Steep Terrain, Herbaceous Fuel

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area 640 acres and applies under the following conditions: where the terrain of the majority of the area to be burned >15% slopes with herbaceous and/or low volatile woody fuel with no high volatile fuels. 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)

Before Situation:

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

After Situation:

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

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 320

Scenario Cost: $4,318.38 **Scenario Cost/Unit:** $13.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$41.42	1	$41.42
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$30.49	20	$609.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$25.19	20	$503.80
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hour	$16.43	20	$328.60
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	$2.12	20	$42.40
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	$24.97	64	$1,598.08
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	24	$427.92
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	$35.96	16	$575.36
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallon	$3.82	50	$191.00

Practice: 340 - Cover Crop

Scenario: #1 - Mixed Species - Mech/Chem Kill

Scenario Description:

Typically a cover crop consisting of a small grain-legume mix or a cowpea-radish mix (may also use forage sorghum, turnips, buckwheat, etc) will be planted immediately after the harvest of a crop (within 30 days), and will be followed by a crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop is terminated by chemical or mechanical means following NRCS Cover Crop Termination Guidelines. Common resource concerns include Soil Erosion - sheet & rill and wind erosion, Soil Quality Degradation - Subsidence, compaction and Organic Matter depletion, Degraded Plant Condition - undesirable plant productivity and health and Inadequate Livestock Production Limitation - Inadequate feed and forage.

Before Situation:

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

After Situation:

Immediately after harvest (within 30 days), fields are planted with a cool season or warm season cover crop mix. The average field size is 40 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring or throughout the summer months. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated by using an approved herbicide or mechnical kill method (mowing, rolling, undercutting, etc.), prior to planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing residues. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $3,629.40 **Scenario Cost/Unit:** $90.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	40	$663.20
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$15.94	20	$318.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$4.76	20	$95.20
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$55.89	40	$2,235.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.83	20	$316.60

Practice: 340 - Cover Crop

Scenario: #2 - Cover Crop-Non-Legume, DeadLitter

Scenario Description:

Typically a small grain will be planted as a cover crop immediately after harvest (within 30 days) 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 no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using chemical or mechnical methods following NRCS Cover Crop 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. 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 organic matter declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Immediately after harvest of row crop (within 30 days), fields are planted with a small graincover crop. The average field size is 40 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide or by mechincal means 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.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $2,855.80 **Scenario Cost/Unit:** $71.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	40	$663.20
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$15.94	20	$318.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$4.76	20	$95.20
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$36.55	40	$1,462.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.83	20	$316.60

Practice: 340 - Cover Crop

Scenario: #3 - Legume-N Fixation

Scenario Description:

A legume 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 fixed nitrogen and cover crop biomass as a mulch. This scenario assumes that seed will be planted with a no-till drill. Legume seeds must be inoculated with the proper inoculant prior to planting. The cover crop should be allowed to reach early to mid-bloom before it is terminated, using chemical or mechanical methods following NRCS Cover Crop Termination Guidelines, in order to maximize nitrogen fixation. The legume will promote biological nitrogen fixation and reduce energy use by reducing the need for commercial nitrogen fertilizer in following crops.

Before Situation:

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

After Situation:

Immediately after harvest (within 30 days) fields are planted with a legume cover crop, typically a clover or vetch species. Legume seeds must be inoculated with the proper inoculant prior to planting. The average field size is 40 acres. The cover crop is seeded with a no-till drill. No fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated with an approved herbicide or mechanical methods prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect. By utilizing the nitrogen that is fixed by the legume cover crop, the amount of energy is reduced by reducing the amount of commercial fertilizer that will be needed for the following crop.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $2,855.80 **Scenario Cost/Unit:** $71.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$4.76	20	$95.20
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$15.94	20	$318.80
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	40	$663.20
Materials						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	$36.55	40	$1,462.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.83	20	$316.60

Practice: 340 - Cover Crop

Scenario: #4 - Organic Cover Crop

Scenario Description:

Typically a small grain or small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc) will be planted as a cover crop immediately after harvest (within 30 days) of an organically grown crop, and will be followed by an organically grown crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.) prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed.

Before Situation:

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

After Situation:

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

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: $2,210.25 **Scenario Cost/Unit:** $88.41

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	25	$414.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$15.94	25	$398.50
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$55.89	25	$1,397.25

Practice: 340 - Cover Crop

Scenario: #5 - Multispecies Cover Crop on Pasture

Scenario Description:

Typically a small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc) will be overseeded into periennial pasture for purposes of improving soil health. Cover crop species are drilled into native or improved pastures (Bermuda Grass/Bahia Grass) . This scenario assumes that seed will be planted with a no-till drill. Legume seeds must be inoculated with the proper inoculant prior to planting.The cover crop should be allowed to generate as much biomass as possible. Covers may be grazed to a level that meets their conservation purpose.

Before Situation:

Both improved and native pastures are overgrazed and little cover remains through fall and winter. Pasture management typically includes application of nutrients to a predominant monoculture of improved grasses. Soil organic matter is reduced, soil temperatures exceed the ambient air temperature reducing biological activity in the soil due to high soil temeratures and low soil moisture. Exposed pasture soils are subjected to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the summer residue continues to degrade and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with rills visible by early fall. Soil organic matter declines over time as a result of overgrazing, lack of biomass production and long periods of bare soil. Biological fixation of nitrogen is not occurring due to lack of diversity (legumes).

After Situation:

Pastures are overseeded with a mixed species cover in the late summer or early fall, with either cool-season annuals on warm season pastures or warm season annuals on cool season pastures. The average field size is 40 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied. The cover crop provides soil cover during the fall, throughout the winter, and into the early spring until the existing pasture species begin growth. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop will be managed to maximize plant biomass production and mob-grazed (high intensity, short duration) . Wind erosion is reduced by standing residues. Over time, soil health is improved due to the additional biomass and the plant diversity introduced to the pasture system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect. Soil moisture is improved.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $2,898.80 **Scenario Cost/Unit:** $72.47

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	40	$663.20
Materials						
Five Species Mix, Cool Season, Annual Grasses and Legumes	2320	Cool season, introduced grass and legume mix. Includes material and shipping only.	Acre	$55.89	40	$2,235.60

Practice: 342 - Critical Area Planting

Scenario: #1 - Dozer, Introduced Plants with N,P and K fertilizer

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 leveling, shaping, or pulling extra heavy tillage equipment, seedbed preparation with typical tillage implements, bermudagrass seed or sprigs, and fertilizer needed for establishment.

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 possibly small gullies. Gullies and rills are treatable by shaping with a dozer or extra heavy tillage equipment such as a rhome disk and minimal blade work. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by smoothing rills and shaping small gullies with heavy tillage and dozer work and then applying fertilizer and seeding. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Application of fertilizer will be made as outlined in the standard. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, sprig or seed adapted grass species (such as bermudagrass) for a vegetative cover.

Scenario Feature Measure: Area shaped and planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $463.29 **Scenario Cost/Unit:** $463.29

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	$78.12	1	$78.12
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$5.27	1	$5.27
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	1	$8.65
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$55.12	1	$55.12
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	$24.24	1	$24.24
Materials						
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Native, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	$59.62	1	$59.62
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.29	20	$5.80
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	$0.28	20	$5.60
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	$0.47	20	$9.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47

Practice: 342 - Critical Area Planting

Scenario: #2 - Dozer, Introduced Plants with NPK and Lime

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 leveling, shaping or pulling extra heavy tillage equipment, seedbed preparation with typical tillage implements, introduced grass seed or sprigs, and fertilizer/lime needed for establishment.

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 may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and possibly small gullies. Gullies and rills are treatable by shaping with a dozer or extra heavy tillage equipment such as a rhome disk and minimal blade work. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has low fertility and a pH imbalance.

After Situation:

This typical 1.0 acre critical area is stabilized by smoothing rills and small gullies with heavy tillage and minimal blade work and then applying fertilizer, lime and seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Apply fertilizer and lime as outlined in the standard. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, sprig or drill adapted grass species (such as bermudagrass) for a vegetative cover.

Scenario Feature Measure: area shaped and planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $501.93 **Scenario Cost/Unit:** $501.93

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$5.27	1	$5.27
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	$78.12	1	$78.12
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.88	1	$7.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$55.12	1	$55.12
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	1	$8.65
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	$24.24	1	$24.24
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.47	20	$9.40
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$90.38	1	$90.38
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	$0.28	20	$5.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.29	20	$5.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47

Practice: 342 - Critical Area Planting

Scenario: #3 - Normal till with Introduced grass and NPK

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance or vegetation of newly constructed conservation practices such as ponds, waterways, diversions, etc. Costs include tillage equipment, seedbed preparation with typical tillage implements, introduced grass seed or sprigs, and fertilizer needed for establishment.

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. All rills are treatable with tillage equipment. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by smoothing rills and then applying fertilizerand seed. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Apply fertilizer as outlined in the standard. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, sprig or drill adapted grass species (such as bermudagrass) for a vegetative cover.

Scenario Feature Measure: area smoothed and planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $206.86 **Scenario Cost/Unit:** $206.86

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	1	$8.65
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$5.27	1	$5.27
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	$78.12	1	$78.12
Materials						
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Native, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	$59.62	1	$59.62
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.29	40	$11.60
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	$0.28	55	$15.40
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.47	60	$28.20

Practice: 342 - Critical Area Planting

Scenario: #4 - Normal till, Introduced Grass with NPK and Lime

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance or vegetation of newly constructed conservation practices such as ponds, waterways, diversions, etc.. Costs include tillage equipment, seedbed preparation with typical tillage implements, introduced grass seed or sprigs, and fertilizer/lime needed for establishment.

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. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has low fertility and a pH imbalance.

After Situation:

This typical 1.0 acre critical area is stabilized by smoothing rills and then applying fertilizer, lime and seed or sprigs. Soil amendments will be incorporated at an depth of six inches to improve fertility and ensure establishment of permanent vegetative cover. Apply fertilizer as outlined in the standard with an application of 1 ton of lime typically. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, sprig or drill adapted grass species (such as bermudagrass) for a vegetative cover.

Scenario Feature Measure: area smoothed and planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $270.72 **Scenario Cost/Unit:** $270.72

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	1	$8.65
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.88	1	$7.88
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$5.27	1	$5.27
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	$78.12	1	$78.12
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$90.38	1	$90.38
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.29	20	$5.80
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	$0.28	20	$5.60
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	$0.47	20	$9.40
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Native, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	$59.62	1	$59.62

Practice: 342 - Critical Area Planting

Scenario: #5 - Dozer, Native Species w NPK Lime

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 leveling, shaping, or pulling extra heavy tillage equipment, seedbed preparation with typical tillage implements, a dead litter crop, native grass seed, soil amendments and seeding operation needed for establishment.

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 possibly small gullies averaging 1 foot in depth and 1 foot in width. Gullies and rills are treatable by shaping with a dozer or extra heavy tillage equipment such as a rhome disk and minimal blade work. 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.

After Situation:

This typical 1.0 acre critical area is stabilized by smoothing rills and small gullies with heavy tillage and minimal blade work and then applying lime (if needed) and seed. Soil amendments will be incorporated at an depth of six inches to improve pH and ensure establishment of permanent vegetative cover. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, drill adapted native grass species for a vegetative cover.

Scenario Feature Measure: area shaped and planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $490.42 **Scenario Cost/Unit:** $490.42

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.88	1	$7.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	1	$16.58
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$55.12	2	$110.24
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	1	$8.65
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	$24.24	2	$48.48
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$90.38	1	$90.38
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$65.98	1	$65.98
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	$142.23	1	$142.23

Practice: 342 - Critical Area Planting

Scenario: #1 - Normal tillage, Native Grass with Lime

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 normal tillage for seedbed preparation with typical tillage implements native grass seed, soil amendments and seeding operation needed for establishment.

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 possibly small gullies averaging 1 foot in depth and 1 foot in width. All gullies are treatable with leveling tillage equipment such as a disk. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has low fertility and possibly a pH imbalance.

After Situation:

This typical 1.0 acre critical area is stabilized by smoothing rills and small gullies with tillage and then applying lime and seed. Soil amendments will be incorporated at an depth of six inches to improve pH and ensure establishment of permanent vegetative cover. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, drill adapted native grass species for a vegetative cover.

Scenario Feature Measure: Area smoothed and planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $424.63 **Scenario Cost/Unit:** $424.63

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	1	$8.65
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$12.89	1	$12.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	1	$16.58
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	$17.83	10	$178.30
Materials						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	$65.98	1	$65.98
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	$142.23	1	$142.23

Practice: 344 - Residue Management, Seasonal

Scenario: #1 - Residue Management, Seasonal

Scenario Description:

Historically, producers have focused tillage activities in the spring and fall, both immediately before and after the cash crop. Tillage activities have been intensive, and have served to both suppress weeds, reduce insect populations, and prepare fields for both immediate (spring) and subsequent (fall) planting events. These periods of intensive tillage have led to excessive soil loss, often above the Soil Loss Tolerance (T), due to the loss of critical crop or weed residue and have also resulted in a loss of seasonal wildlife cover. The RUSLE2 and/or WEPS models will be used to review the farming operation and determine if enough residue is being retained between planted crops to keep soil loss below T and the appropriate wildlife habitat tools will be used to assess wildlife habitat - where wildlife is an identified concern. The producer will then remove operations, or select alternate operations, to manage residue between planted crops.

Before Situation:

Row crops or small grains 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 and a poor cover situation for wildlife. Over the winter residue degrades and sediment/nutrient runoff from fields increases. wind and/or water erosion occurs. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Weed control is accomplished primarily through tillage, requiring multiple operations. Sediment and nutrient runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

Residue Management, Seasonal is applied per the practice plan following all the appropriate criteria for the planned purpose(s). No tillage occurs after crop harvest until just prior to planting the next crop. In warmer areas, winter weeds or cover crops grow throughout the winter months. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and and wildlife cover is improved . Wind erosion is reduced by standing residues. Winter weeds or the cover crop is terminated with tillage, a roller-crimper, shredding, with an approved herbicide, or a combination of these methods prior to spring planting as late as feasible. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $152.83 **Scenario Cost/Unit:** $3.82

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
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	$35.96	4.25	$152.83

Practice: 345 - Res. & Tillage Mgt, Mulch-till

Scenario: #1 - Mulch till-Basic

Scenario Description:

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

Before Situation:

Row crops such as corn, 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. Sheet and rill erosion occurs with visible rills by spring. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

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

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: $3,291.00 **Scenario Cost/Unit:** $32.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$8.65	200	$1,730.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$16.58	50	$829.00
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	$14.64	50	$732.00

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 2500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Excavated volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,500

Scenario Cost: $5,926.90 **Scenario Cost/Unit:** $2.37

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	41.7	$4,252.15
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1	$260.19
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	$24.24	41.7	$1,010.81
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	$403.75	1	$403.75

Practice: 350 - Sediment Basin

Scenario: #2 - Embankment Basin, No 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 an 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 2000 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 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). No principal spillway will be used. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,000

Scenario Cost: $4,866.73 **Scenario Cost/Unit:** $2.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1	$260.19
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	33.3	$3,395.60
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	$24.24	33.3	$807.19
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	$403.75	1	$403.75

Practice: 350 - Sediment Basin

Scenario: #3 - Embankment Basin, Pipe Material 1000 Diameter Inch Foot or Smaller

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 principle spillway less than or equal to 1000 Diameter Inch Foot of pipe material 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 3,000 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 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The typical principal spillway pipe is 100' long and 8" in diameter (800 Dia-In-Ft) with 3 - 5'x5' anti-seep collars. The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Volume of Embankment

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,000

Scenario Cost: $8,973.88 **Scenario Cost/Unit:** $2.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	50	$5,098.50
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1	$260.19
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	2	$91.86
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	$24.24	52	$1,260.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	16	$285.28
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$23.35	7	$163.45
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	$2.21	225.7	$498.80

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.67	0.3	$7.10
Pipe, CMP, 8", 16 Gauge	1267	8" Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Foot	$6.93	100	$693.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75

Practice: 350 - Sediment Basin

Scenario: #4 - Embankment Basin, Pipe Material 1001-1500 Diameter Inch Foot

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 principle spillway 1001 - 1500 Diameter Inch Foot of pipe material 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 3,000 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 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The typical principal spillway pipe is 110' long and 12" in diameter (1320 Dia-In-Ft) with 3 - 5'x5' anti-seep collars. The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,000

Scenario Cost: $9,567.88 **Scenario Cost/Unit:** $3.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1	$260.19
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	2	$91.86
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	50	$5,098.50
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	$24.24	52	$1,260.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	16	$285.28
Materials						
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.21	225.7	$498.80
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.67	0.3	$7.10
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$23.35	7	$163.45

Materials

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	$1.17	1100	$1,287.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75

Practice: 350 - Sediment Basin

Scenario: #5 - Embankment Basin, Pipe Material 1501-2500 Diameter Inch Foot

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 principle spillway 1501 - 2500 Diameter Inch Foot of pipe material 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 3,000 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 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The typical principal spillway pipe is 120' long and 18" in diameter (2160 Dia-In-Ft) with 3 - 5'x5' anti-seep collars. The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,000

Scenario Cost: $10,724.43 **Scenario Cost/Unit:** $3.57

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	50	$5,098.50
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1.5	$390.29
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	2	$91.86
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	$24.24	52	$1,260.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	20	$356.60
Materials						
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	$1.17	1800	$2,106.00
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$23.35	7	$163.45
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	$2.21	287.3	$634.93

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.67	0.3	$7.10

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75

Practice: 350 - Sediment Basin

Scenario: #6 - Embankment Basin, Pipe Material 2501-3500 Diameter Inch Foot

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 principle spillway 2501 - 3500 Diameter Inch Foot of pipe material 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 3,000 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 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The typical principal spillway pipe is 130' long and 24" in diameter (3120 Dia-In-Ft) with 3 - 6'x6' anti-seep collars. The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,000

Scenario Cost: $11,683.45 **Scenario Cost/Unit:** $3.89

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1.5	$390.29
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	2	$91.86
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	50	$5,098.50
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	$24.24	52	$1,260.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	20	$356.60
Materials						
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	$1.17	2470	$2,889.90
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	$2.21	287.3	$634.93
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.67	0.3	$7.10

Materials

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$23.35	14.5	$338.58

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75

Practice: 350 - Sediment Basin

Scenario: #7 - Embankment Basin, Pipe Material 3501 Diameter Inch Foot and Larger

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 principle spillway greater than or equal to 3501 Diameter Inch Foot of pipe material 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 3,000 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 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The typical principal spillway pipe is 130' long and 30" in diameter with 3 - 6.5'x6.5' anti-seep collars. The typical riser is 4.5' long and 60" in diameter (4170 Dia-In-Ft). The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,000

Scenario Cost: $13,198.50 **Scenario Cost/Unit:** $4.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$141.60	3	$424.80
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$260.19	1.5	$390.29
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	2	$91.86
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	50	$5,098.50
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	$17.83	30	$534.90
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	$24.24	52	$1,260.48
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$23.35	19.6	$457.66
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$23.67	0.3	$7.10

Materials

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	$1.17	3390	$3,966.30
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	$2.21	159	$351.39

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	$403.75	1	$403.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47

Practice: 351 - Water Well Decommissioning

Scenario: #1 - Wells less than or equal to 15 feet deep, 3 to 36 inch diameters.

Scenario Description:

For inactive, abandoned, or unusable wells less than or equal to 15' in depth, 3" to 36" diameter openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole.

Before Situation:

The typical scenario assumes a 15' deep well with a 15" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes both earth materials and cement grout would be used to backfill.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 15

Scenario Cost: $1,027.42 **Scenario Cost/Unit:** $68.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	2	$91.86
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	$17.83	1	$17.83
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	$24.24	2	$48.48
Skilled Labor	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	$24.97	1	$24.97
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	$577.49	0.7	$404.24
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1	$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #2 - Wells greater than 15 feet deep to 25 feet deep, 3 to 36 inch diameters.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 15' and less than or equal to 25' in depth, 3" to 36" diameter openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole.

Before Situation:

The typical scenario assumes a 25' deep well with a 12" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes both earth materials and cement grout would be used to backfill.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 25

Scenario Cost: $1,183.19 **Scenario Cost/Unit:** $47.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	3	$137.79
Labor						
Skilled Labor	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	$24.97	3	$74.91
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	$24.24	3	$72.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	3	$53.49
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	$577.49	0.7	$404.24
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1	$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #3 - Wells greater than 25 feet deep to 40 feet deep, 3 to 36 inch diameters.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 25' and less than or equal to 40' in depth, 3" to 36" diameter openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole.

Before Situation:

The typical scenario assumes a 40' deep well with a 10" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes both earth materials and cement grout would be used to backfill.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 40

Scenario Cost: $1,240.94 **Scenario Cost/Unit:** $31.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	3	$137.79
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	3	$53.49
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	$24.24	3	$72.72
Skilled Labor	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	$24.97	3	$74.91
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1	$2.83
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	$577.49	0.8	$461.99
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #4 - Wells greater than 40 feet deep to 75 feet deep, 3 to 36 inch diameters.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 40' and less than or equal to 75' in depth, 3" to 36" diameter openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole.

Before Situation:

The typical scenario assumes a 75' deep well with a 10" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes both earth materials and cement grout would be used to backfill.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 75

Scenario Cost: $1,620.22 **Scenario Cost/Unit:** $21.60

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	3	$137.79
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
Labor						
Skilled Labor	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	$24.97	2	$49.94
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	$24.24	3	$72.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	3	$53.49
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	$577.49	1.5	$866.24
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1	$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #5 - Wells greater than 75 feet deep to 300 feet deep, 10 inch diameter or less.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 75' and less than or equal to 300' in depth, 0 to 10" diameter openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole. A licensed well driller is responsible for wells drilled and abandoned prior to the drilling equipment being removed.

Before Situation:

The typical scenario assumes a 175' deep well with a 6" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes cement grouting the entire well column under the typical situation, though other suitable materials as prescribed in the standard criteria may be used.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 175

Scenario Cost: $1,808.70 **Scenario Cost/Unit:** $10.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	6	$275.58
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	$17.83	4	$71.32
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	$24.24	5	$121.20
Skilled Labor	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	$24.97	6	$149.82
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1	$2.83
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	$577.49	1.3	$750.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #6 - Wells greater than 300 feet deep, 10 inch diameter or less.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 300' in depth, 0 to 10" diameter openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole. A licensed well driller is responsible for wells drilled and abandoned prior to the drilling equipment being removed.

Before Situation:

The typical scenario assumes a 400' deep well with a 6" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes cement grouting the entire well column under the typical situation, though other suitable materials as prescribed in the standard criteria may be used.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 400

Scenario Cost: $2,809.43 **Scenario Cost/Unit:** $7.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	5	$229.65
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	$17.83	8	$142.64
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.97	8	$199.76
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	$24.24	5	$121.20
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1.5	$4.25
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	$577.49	2.9	$1,674.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #7 - Wells greater than 75 feet deep to 300 feet deep, exceeds 10 inch diameter.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 75' and less than or equal to 300' in depth, 10" diameter or greater openings, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole. A licensed well driller is responsible for wells drilled and abandoned prior to the drilling equipment being removed.

Before Situation:

The typical scenario assumes a 200' deep well with a 16" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes cement grouting the entire well column under the typical situation, though other suitable materials as prescribed in the standard criteria may be used.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 200

Scenario Cost: $5,088.88 **Scenario Cost/Unit:** $25.44

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	4	$183.72
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	1	$14.27
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	$17.83	5	$89.15
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	$24.24	4	$96.96
Skilled Labor	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	$24.97	5	$124.85
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$10.15	375	$3,806.25
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	$577.49	0.6	$346.49
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1.5	$4.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #8 - Wells greater than 300 feet deep, exceeds 10 inch diameter.

Scenario Description:

For inactive, abandoned, or unusable wells greater than 300' in depth, and for casings exceeding 10 inch diameter, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole. A licensed well driller is responsible for wells drilled and abandoned prior to the drilling equipment being removed.

Before Situation:

The typical scenario assumes a 500' deep well with a 16" diameter well casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes cement grouting the entire well column based on rate shown, though other suitable materials as prescribed in the standard criteria may actually be used.

Scenario Feature Measure: Depth of Well

Scenario Unit: Foot

Scenario Typical Size: 500

Scenario Cost: $11,433.73 **Scenario Cost/Unit:** $22.87

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	5	$229.65
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	$14.27	2	$28.54
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	$17.83	8	$142.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.24	5	$121.20
Skilled Labor	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	$24.97	8	$199.76
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	2	$5.66
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	$577.49	0.6	$346.49
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$10.15	979	$9,936.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 351 - Water Well Decommissioning

Scenario: #9 - Hand dug, greater than 3 feet to 5 feet diameter, all depths.

Scenario Description:

For inactive, abandoned, or unusable hand dug wells greater than 3' and less than or equal to 5' in diameter, all depths, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole. Backfill shall be placed and compacted in a manner that minimizes segredation and bulking to prevent surface subsidence.

Before Situation:

The typical scenario assumes a 4' diameter well, 25' deep, with or without mortar casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes filling the well with suitable fill materials as prescribed in the standard criteria.

Scenario Feature Measure: Depth of well

Scenario Unit: Foot

Scenario Typical Size: 25

Scenario Cost: $629.80 **Scenario Cost/Unit:** $25.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$4.76	13	$61.88
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	4	$183.72
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$20.50	3	$61.50
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	6	$106.98
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	1.5	$4.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47

Practice: 351 - Water Well Decommissioning

Scenario: #10 - Hand dug, greater than 5 feet in diameter, all depths.

Scenario Description:

For inactive, abandoned, or unusable hand dug wells greater than 5 feet in diameter, all depths, the landowner is responsible for plugging the well in order to prevent entry of vermin, debris, contaminated surface waters, or other foreign substances from entering the groundwater, and to eliminate potential physical hazards associated to an open hole. Backfill shall be placed and compacted in a manner that minimizes segredation and bulking to prevent surface subsidence.

Before Situation:

The typical scenario assumes a 6' diameter well, 25' deep, with or without mortar casing.

After Situation:

Plugging shall conform to the criteria of the standard, and take into consideration other associated practices such as 342, Critical Area Seeding. It assumes filling the well with suitable fill materials as prescribed in the standard criteria.

Scenario Feature Measure: Depth of well

Scenario Unit: Foot

Scenario Typical Size: 25

Scenario Cost: $759.52 **Scenario Cost/Unit:** $30.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.93	5	$229.65
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$4.76	26	$123.76
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$20.50	4	$82.00
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	6	$106.98
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	$2.83	2	$5.66
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	1	$211.47

Practice: 355 - Well Water Testing

Scenario: #1 - Basic Water Test

Scenario Description:

Typical scenario includes the professional testing for total alkalinity, hardness, pH, total soluble solids, nitrates, nitrites, total dissolved solids, 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 unacceptable.

Before Situation:

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

After Situation:

Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $100.79 **Scenario Cost/Unit:** $100.79

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.97	2.5	$62.43
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	$38.36	1	$38.36

Practice: 355 - Well Water Testing

Scenario: #2 - Specialty Water Test

Scenario Description:

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

Before Situation:

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

After Situation:

Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $250.81 **Scenario Cost/Unit:** $250.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.97	2.5	$62.43
Materials						
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	$150.02	1	$150.02
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	$38.36	1	$38.36

Practice: 355 - Well Water Testing

Scenario: #3 - Full Spectrum Test

Scenario Description:

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

Before Situation:

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

After Situation:

Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $294.56 **Scenario Cost/Unit:** $294.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.97	2.5	$62.43
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	$193.77	1	$193.77
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	$38.36	1	$38.36

Practice: 356 - Dike

Scenario: #1 - Class III

Scenario Description:

Construction of a barrier, constructed of an earthen embankment, to control water level that is located on a site where damage likely to occur from failure will be minimal (Class III). Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. 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 managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available on-site.

After Situation:

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided. Typical earthen dike is assumed to be 1500 linear feet, Class III (3 ft. in height, 10 ft. top width, 6H:1V side slopes). Total Volume is 4,667 cy

Scenario Feature Measure: Volume of Earthfill (including volume of soil berm, as needed)

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,667

Scenario Cost: $13,049.87 **Scenario Cost/Unit:** $2.80

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$101.97	97	$9,891.09
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	$24.24	97	$2,351.28
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	2	$807.50

Practice: 359 - Waste Treatment Lagoon

Scenario: #1 - Waste Treatment Impoundment

Scenario Description:

A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. When a liner is required to prevent seepage, plan the appropriate pond sealing and lining conservation practice standard..

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

Before Situation:

Operator presently has a dairy or animal feeding operation where animals are confined in a small area for a period of time each day ranging from a couple of hours to 24 hours per day. The operation does not have a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A waste treatment lagoon that is constructed by excavation and earth-fill that stores wastes such as manure, waste water, and contaminated runoff. The purpose of this facility is to biologically treat waste, such as manure and wastewater, and thereby reduce pollution potential by serving as a treatment component of an agricultural waste management system. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan.
Typical design size : Design Volume 439,440 ft3; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13'; 1' freeboard (not included in total depth). Excavated Volume 8,500 CY, Earthfill Volume 6,800 CY

Scenario Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 439,440

Scenario Cost: $26,995.25 **Scenario Cost/Unit:** $0.06

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$2.98	8500	$25,330.00
Materials						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	$3.35	15	$50.25
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	$403.75	4	$1,615.00

Practice: 359 - Waste Treatment Lagoon

Scenario: #2 - Waste Treatment Impoundment, Rehabilitation

Scenario Description:

This scenario is for the rehabilitation of an existing waste treatment lagoon. A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. When a liner is required to prevent seepage, plan the appropriate pond sealing and lining conservation practice standard.
REQUIRES THE PRODUCER TO REMOVE ALL LIQUID AND SLURRY AS NORMAL OPERATION AND MAINTENANCE.

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

Before Situation:

Operator presently has a dairy or animal feeding operation where animals are confined in a small area for a period of time each day ranging from a couple of hours to 24 hours per day. The operation does have an existing waste management system with a waste treatment lagoon that is inadequate to handle the waste stream leaving the animal production facilities. The existing waste treatment lagoon has exceeded its original design life and no longer has the required treatment volume due to accumulation of solids. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A waste treatment lagoon that has been rehabilitated by removal of all waste to restore the waste treatment volume required to meet the operations current operation. In most cases the waste treatment lagoon has to be increased in size due to operations current; animal numbers and management, design criteria and/or regulations. The purpose of this facility is to biologically treat waste, such as manure and wastewater, and thereby reduce pollution potential by serving as a treatment component of an agricultural waste management system. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan.
Typical design size :
**REQUIRES THE PRODUCER TO REMOVE ALL LIQUID AND SLURRY AS NORMAL OPERATION AND MAINTENANCE.
Before Design Volume 340,875 ft3; 208' X 208' (top); 3:1 inside and outside side slopes; total depth = 13'; 1' freeboard (not included in total depth); Two foot of sludge accumulated in the bottom.
After Design Volume 439,440 ft3; 260' X 208' (top); 3:1 inside and outside side slopes; Excavated Volume 4,000 CY, Earthfill Volume 3,200 CY. Requires installation of new liner or certification of the existing liner by a Professional Engineer.

Scenario Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 439,440

Scenario Cost: $47,462.47 **Scenario Cost/Unit:** $0.11

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
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	$0.28	33831	$9,472.68
Excavation, clay, large equipment, 150 ft	1219	Bulk excavation of clay with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$5.01	3479	$17,429.79
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$18.13	20	$362.60
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$0.71	500	$355.00
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$152.93	20	$3,058.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	$2.97	500	$1,485.00

Equipment/Installation

Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.62	3200	$11,584.00

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	$24.24	20	$484.80

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	$403.75	8	$3,230.00

Practice: 360 - Waste Facility Closure

Scenario: #1 - Not pumpable, not converted to freshwater storage

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 15% liquid/slurry waste and 85% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will not be converted to freshwater storage. 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. The consistancy of the sludge/solid waste is too wet to be spread with conventional spreader and too solid to be agitated and pumped to sprinkler or tanker disposal vehicles. 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 an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards volume below spillway. The volume of solid waste to be removed is approximately 85% of the storage volume 85% X 20,000 = 17,000 CY. The sludge/solid waste will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Stockpiling of the solid waste for drying may be needed to obtain a suitable moisture content prior to land application. 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 total volume. The volume of earthwork to be paid on the placement of compacted earthfilll based on 50% of the total volume, which is 10,000 CY.

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 waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. 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.

Monitoring wells may be needed in certain situations to comply with regulatory requirements.

Scenario Feature Measure: Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 540,000

Scenario Cost: $173,094.28 **Scenario Cost/Unit:** $0.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
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	$0.28	459000	$128,520.00
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	605880	$6,058.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.62	10000	$36,200.00
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	$93.56	8	$748.48

Labor

Labor

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	8	$142.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.24	8	$193.92

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	2	$807.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 360 - Waste Facility Closure

Scenario: #2 - Pumpable, not converted to freshwater storage

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 15% liquid/slurry waste and 85% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will not be converted to freshwater storage. 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. The consistancy of the waste is such that it can be agitated and pumped to a sprinkler or tanker disposal vehicles. 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 an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards volume below spillway. The volume of solid waste to be removed is approximately 85% of the storage volume 85% X 20,000 = 17,000 CY. The sludge/solid waste will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Stockpiling of the solid waste for drying may be needed to obtain a suitable moisture content prior to land application. 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 total volume. The volume of earthwork to be paid on the placement of compacted earthfilll based on 50% of the total volume, which is 10,000 CY.

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 waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. 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.

Monitoring wells may be needed in certain situations to comply with regulatory requirements.

Scenario Feature Measure: Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 540,000

Scenario Cost: $95,528.68 **Scenario Cost/Unit:** $0.18

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
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	$0.28	81000	$22,680.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.62	10000	$36,200.00
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	3433320	$34,333.20
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$93.56	8	$748.48

Labor

Labor

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	8	$142.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.24	8	$193.92

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	2	$807.50
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 360 - Waste Facility Closure

Scenario: #3 - Not pumpable, convert to freshwater storage

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 15% liquid/slurry waste and 85% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will not be converted to freshwater storage. 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. The consistancy of the sludge/solid waste is too wet to be spread with conventional spreader and too solid to be agitated and pumped to sprinkler or tanker disposal vehicles. 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 an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards volume below spillway. The volume of solid waste to be removed is approximately 85% of the storage volume 85% X 20,000 = 17,000 CY. The sludge/solid waste will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Stockpiling of the solid waste for drying may be needed to obtain a suitable moisture content prior to land application. 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 total volume. The volume of earthwork to be paid on the placement of compacted earthfilll based on 50% of the total volume, which is 10,000 CY.

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 waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. 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.

Monitoring wells may be needed in certain situations to comply with regulatory requirements.

Scenario Feature Measure: Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 540,000

Scenario Cost: $140,390.53 **Scenario Cost/Unit:** $0.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$93.56	8	$748.48
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	605880	$6,058.80
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	$1.95	2000	$3,900.00
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.28	459000	$128,520.00

Labor

Labor

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	8	$142.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.24	8	$193.92

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 360 - Waste Facility Closure

Scenario: #4 - Pumpable, convert to freshwater storage

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 15% liquid/slurry waste and 85% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will not be converted to freshwater storage. 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. The consistancy of the waste is such that it can be agitated and pumped to a sprinkler or tanker disposal vehicles.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 an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards volume below spillway. The volume of solid waste to be removed is approximately 85% of the storage volume 85% X 20,000 = 17,000 CY. The sludge/solid waste will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Stockpiling of the solid waste for drying may be needed to obtain a suitable moisture content prior to land application. 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 total volume. The volume of earthwork to be paid on the placement of compacted earthfilll based on 50% of the total volume, which is 10,000 CY.

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 waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. 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.

Monitoring wells may be needed in certain situations to comply with regulatory requirements.

Scenario Feature Measure: Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 540,000

Scenario Cost: $62,824.93 **Scenario Cost/Unit:** $0.12

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	3433320	$34,333.20
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	$0.28	81000	$22,680.00
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	$1.95	2000	$3,900.00
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	$93.56	8	$748.48

Labor

Labor

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$17.83	8	$142.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$24.24	8	$193.92

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$211.47	2	$422.94

Practice: 362 - Diversion

Scenario: #1 - Earth Channel and Ridge

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, 1300 feet long installed on a field slope of 5 percent and requires 1.5 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 agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

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

Scenario Feature Measure: Diversion Fill Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,950

Scenario Cost: $3,309.25 **Scenario Cost/Unit:** $1.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.49	1950	$2,905.50
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$403.75	1	$403.75

Practice: 367 - Roofs and Covers

Scenario: #1 - Timber and Steel Sheet Roof

Scenario Description:

A steel framed building with a 29 gage corrugated sheet metal roof and steel trusses and truss supports is required by the engineering design. Agricultural wastes such as manure, animal mortality and poultry litter are stored on concrete and earthen surfaces under the roof. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. To be used in conjunction with waste management facilities, and typically installed over an approved Waste Storage Facility 313.
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 an existing or planned system. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces under the roof. Excess precipitation can cause premature filling of storages, interfere with composting 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 29 gage corrugated sheet metal roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 930 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the before practice implementation.

Scenario Feature Measure: Footprint of Building

Scenario Unit: Square Foot

Scenario Typical Size: 930

Scenario Cost: $7,737.60 **Scenario Cost/Unit:** $8.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building , less than 30' wide	1672	Post Frame Building, no sides, - less than 30' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipp	Square Foot	$8.32	930	$7,737.60

Practice: 367 - Roofs and Covers

Scenario: #2 - Steel Frame and Roof

Scenario Description:

A steel framed building with a 29 gage corrugated sheet metal roof and steel trusses and truss supports is required by the engineering design. Agricultural wastes such as manure, animal mortality and poultry litter are stored on concrete and earthen surfaces under the roof. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. To be used in conjunction with waste management facilities, and typically installed over an approved Waste Storage Facility 313.
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 an existing or planned system. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces uunder the roof. 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 a 29 gage corrugated sheet metal roof and steel trusses and truss supports. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 2,600 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams manure or compost streams, thus mitigating the negative factors from the before practice implementation.

Scenario Feature Measure: Footprint of Building

Scenario Unit: Square Foot

Scenario Typical Size: 2,600

Scenario Cost: $18,096.00 **Scenario Cost/Unit:** $6.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building, 30' to 60' wide	1676	Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping	Square Foot	$6.96	2600	$18,096.00