

Practice: 614 - Watering Facility

Scenario: #1 - Converted heavy equipment tire

Scenario Description:

An 8 ft. diameter heavy equipment tire watering trough constructed of approved materials, installed to provide water for livestock. Installation will provide water for livestock on a 10' x 10' concrete foundation. Geotextile and gravel are installed under a concrete pad which stabilizes the tire (extends 1.0' past tank) to protect access from livestock hooves that could cause erosion destabilization of tank. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

The watering facility is installed and supplies water to livestock to meet the livestock needs. All supply pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Water Harvesting Catchment ((636), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,647.00

Scenario Cost/Unit: \$1,647.00

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	\$173.54	1.5	\$260.31
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	11	\$23.76
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.11	2.5	\$140.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	2.5	\$58.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	8	\$152.72
Materials						
Tank, Tire, 8' diameter	286	Tire, includes material cost for tank and shipping. Labor and other appurtenance costs not included.	Each	\$706.03	1	\$706.03
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	1.2	\$46.91
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #2 - 2-hole freeze-proof watering trough

Scenario Description:

A permanent, 2-hole freeze-proof watering tank constructed of approved materials and installed on a 3.5" x 2.5"x 4" concrete foundation with geotextile and 4" gravel, to provide water for livestock.

All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

A 2-hole freeze-proof watering tank is installed to provide water for livestock. All needed pipelines are installed using Livestock Pipeline (516) and any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574) or Water Harvesting Catchment ((636). Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,309.60

Scenario Cost/Unit: \$1,309.60

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	\$173.54	0.1	\$17.35
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	1	\$2.16
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.11	2.5	\$140.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	8	\$152.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	2.5	\$58.68
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	0.1	\$3.91
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	\$676.19	1	\$676.19
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #3 - 4-hole freeze-proof watering trough

Scenario Description:

A permanent, 4-hole freeze-proof watering tank is constructed of approved materials and installed on a 4 x 6' x 4" concrete foundation with geotextile and 4" gravel, installed to provide water for livestock. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

A 4-hole freeze-proof watering tank is installed to provide water for livestock according to plan. All needed pipelines are installed using Livestock Pipeline (516). Disturbed areas will be vegetated using Critical Area Planting (342). The water source is from a Water Well (642), Pumping Plant (533), Spring Development (574), Pond (378) or Water Harvesting Catchment ((636), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns are protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,596.74

Scenario Cost/Unit: \$1,596.74

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	\$173.54	0.4	\$69.42
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	3	\$6.48
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.11	2.5	\$140.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	8	\$152.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	2.5	\$58.68
Materials						
Tank, Freeze Proof, 4 hole	281	Tank, Freeze Proof with 4 drinking holes. Includes materials and shipping.	Each	\$891.31	1	\$891.31
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	0.5	\$19.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #4 - Tank, 100 to 500 gallons

Scenario Description:

A 300 gallon polyethylene tank (5.0' dia.) watering trough constructed of approved materials, installed to provide water for livestock on a 7' x7' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

A 5' dia. tank or watering trough is installed to provide water for livestock on a 7' x7' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Water Harvesting Catchment ((636), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Gallon

Scenario Typical Size: 300

Scenario Cost: \$1,034.21

Scenario Cost/Unit: \$3.45

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	\$56.11	2.5	\$140.28
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	\$173.54	0.8	\$138.83
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	6	\$12.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	8	\$152.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	2.5	\$58.68
Materials						
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	\$248.97	1	\$248.97
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	0.6	\$23.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #5 - Tank, 500 to 1000 gallons

Scenario Description:

A 500 gallon (6' Dia.) concrete tank watering trough constructed of approved materials, installed to provide water for livestock, The tank with bottom liner watering trough is installed to provide water for livestock on a 8' x 8' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

A 6' dia. concrete tank or steel with bottom liner watering trough is installed to provide water for livestock on a 8' x 8' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Water Harvesting Catchment ((636), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,764.70

Scenario Cost/Unit: \$1,764.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	8	\$17.28
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.11	2.5	\$140.28
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	\$173.54	1	\$173.54
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	\$19.09	8	\$152.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	2.5	\$58.68
Materials						
Tank, Concrete, 500 gallon	1049	Concrete tank for water storage, with riser and lid. Includes materials and delivery	Each	\$924.80	1	\$924.80
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	1	\$39.09
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #6 - Tank, greater than 1000 to 1500 gallons

Scenario Description:

A 1,000-1,500 gallon steel with bottom liner watering trough constructed of approved materials, installed to provide water for livestock on a 12' x 12' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

A 1200 gallon concrete tank (10'dia.) or bottomless steel (with bottom liner) watering trough is installed to provide water for livestock on a 12' x 12' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Water Harvesting Catchment ((636), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,708.70

Scenario Cost/Unit: \$1,708.70

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	\$173.54	2.2	\$381.79
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	16	\$34.56
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.11	2.5	\$140.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	2.5	\$58.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	8	\$152.72
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	1.8	\$70.36
Tank, Galvanized Steel Bottomless w/liner Livestock, ≤ 6,000 gallon	1071	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.51	1200	\$612.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32

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Scenario: #7 - Tank, greater than 1500 gallons

Scenario Description:

A >1,500 gallon steel with bottom liner watering trough constructed of approved materials, installed to provide water for livestock on a 14' x 14' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation:

A concrete tank or steel with bottom liner watering trough is installed to provide water for livestock on a 14' x 14' concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Water Harvesting Catchment ((636), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$2,127.74

Scenario Cost/Unit: \$2,127.74

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	\$56.11	3	\$168.33
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$173.54	3	\$520.62
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.16	22	\$47.52
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	3	\$70.41
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	8	\$152.72
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$39.09	2.4	\$93.82
Tank, Galvanized Steel Bottomless w/liner Livestock, ≤ 6,000 gallon	1071	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.51	1600	\$816.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	1	\$258.32