

Practice: 574 - Spring Development

Scenario: #1 - Collection Structure

Scenario Description:

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a water collection structure. Payment includes excavation and labor to expose the spring, concrete for collection box, lid and gravel backfill.

Resource Concern: Livestock production limitation - Inadequate livestock water.

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Site is excavated with a backhoe to expose the seep, a concrete collection box (3'x3'x4') is installed and gravel is backfilled between the spring source and collection box.

Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

Scenario Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,201.43

Scenario Cost/Unit: \$1,201.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$360.59	0.75	\$270.44
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.70	4	\$226.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.32	8	\$162.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.08	4	\$88.32
Materials						
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$169.10	1	\$169.10
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$25.33	1	\$25.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.88	1	\$258.88

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Scenario: #2 - Horizontal Collection Pipe

Scenario Description:

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system. The collection system is commonly composed of perforated drainage pipe placed in an excavated collection trench that runs across the slope, and is piped directly to watering facilities (implemented through associated practice 614).

Resource Concern: Livestock production limitation - Inadequate livestock water.

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long).

Associated Practices: 516-Livestock Pipeline; 614-Watering Facility

Scenario Feature Measure: Number of Development

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$935.13

Scenario Cost/Unit: \$935.13

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	\$2.28	11	\$25.08
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.70	4	\$226.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.32	8	\$162.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.08	4	\$88.32
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$25.33	3	\$75.99
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$25.00	3	\$75.00
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.45	50	\$22.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.88	1	\$258.88

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Scenario: #3 - Horizontal Pipe with Collection Box

Scenario Description:

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system and a water storage structure. The collection system is commonly composed of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope into the collection box.

Resource Concern: Livestock production limitation - Inadequate livestock water.

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a spring box (48 inch diameter x 6 ft long CMP). Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long).

Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

Scenario Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$2,194.38

Scenario Cost/Unit: \$2,194.38

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	\$56.70	8	\$453.60
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$360.59	1	\$360.59
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.28	11	\$25.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.32	16	\$325.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.08	8	\$176.64
Materials						
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	\$3.99	20	\$79.80
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$25.33	3	\$75.99
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.45	50	\$22.50
Pipe, CMP, 48", 14 Gauge	1280	48" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	\$28.68	6	\$172.08
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$169.10	1	\$169.10
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$25.00	3	\$75.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.88	1	\$258.88
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Scenario: #4 - Vertical Collection & Storage Pipe

Scenario Description:

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. Typically installed at the point source of a spring and provides for collection and storage of water. Payment includes the vertical excavation of the spring source, placement of vertical collection pipe and gravel around the pipe.

Resource Concern: Livestock production limitation - Inadequate livestock water.

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a vertical 48 inch diameter x 12 ft tall CMP.

Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

Scenario Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: \$1,803.49

Scenario Cost/Unit: \$1,803.49

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	\$56.70	8	\$453.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.32	16	\$325.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.08	8	\$176.64
Materials						
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$169.10	1	\$169.10
Pipe, CMP, 48", 14 Gauge	1280	48" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	\$28.68	12	\$344.16
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$25.33	3	\$75.99
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.88	1	\$258.88