Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	1
Scenario Name	Inlet +Recep Pit (<1000 gal) + pipe
Scenario Description	Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure pipe. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.
After Practice Situation	This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast 5' dia. manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area and 150 LF of 6" pipe to transfer liquids to final location, a waste storage facility. Transfer pump if needed must be contracted under pumping plant, PS 533.
Scenario Feature Measure	Collection volume installed
Scenario Unit	Gallon
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$3,238.01	$3.24
Equipment/Installation	$2,676.50	$2.68
Labor	$654.08	$0.65
Mobilization	$285.90	$0.29
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$6,854.49	$6.85

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	5	$100.80	Subgrade for concrete inlet slab and catch basin bedding	
Materials	1754	Catch Basin, concrete, 60" dia.	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,306.21	1	$2,306.21	Precast catch basin with riser if needed to provided wastewater collection volume with collar adaptor and grate safety cover.	Volume up to 1000 gal. based on engineering evaluation.
Materials	980	Pipe, PVC, 6", SCH 40	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$5.54	150	$831.00	Transfer liquids to final location	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	2	$1,024.90	Curb on 2 sides of inlet area	2 ft curbs with footer on two sides of inlet slab
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	4	$1,290.80	Inlet slab area	Inlet slab estimated at 15 ft. x 15 ft. reinforced slab on grade
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	8	$360.80	Backhoe for excavation and placement of catch basin	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	8	$302.08	Backhoe operator	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	8	$352.00	Contract supervisor	
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	1	$285.90		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	2
Scenario Name	Inlet +Recep Pit (1k to 5K gal) + pipe
Scenario Description	Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume between 1000 and 5000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow pipe. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.
After Practice Situation	This practice scenario is suitable where the estimated design volume for waste collection and transfer is between 1000 and 5000 gallons of liquid waste. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling and 150' of 6" pipe to move liquids to final location. Transfer pump if needed must be contracted under pumping plant, PS 533.
Scenario Feature Measure	Collection volume installed
Scenario Unit	Gallon
Scenario Typical Size	4300

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$897.62	$0.21
Equipment/Installation	$9,702.94	$2.26
Labor	$2,684.88	$0.62
Mobilization	$285.90	$0.07
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$13,571.34	$3.16

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	993	Pipe, PVC, 6", SDR 35	Materials: - 6" - PVC - SDR 35 - ASTM D3034	Foot	$3.63	150	$544.50	Move liquids to final destination	Typical
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	12	$241.92	Subgrade for concrete inlet slab and catch basin bedding	Subgrade development area total for pit floor and slab.
Materials	1725	Safety chain tractor barrier	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	$2.78	40	$111.20	Safety material installation required by practice standard	Chain barrier for perimeter of reception pit to prevent people, equipment or animals from falling in.
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	14	$7,174.30	Cast in place concrete floor and walls to develop wastewater reception pit and curbing along slab.	Wastewater reception pit sized at 12 ft. wide by 8 ft. long and 6 ft. deep. The walls are 8 inches thick with 4 ft. footers. This quantity also includes the formation of 2 ft. curbs along the slab for containment.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	6	$1,936.20	Inlet slab area	Inlet slab estimated at 22 ft. x 18 ft. reinforced slab on grade with the reception pit at the low corner.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	12	$541.20	Backhoe for excavation of reception pit and backfilling	
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	3	$51.24	Site preparation	Estimated
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	48	$1,093.92	Crew hours for precast basin placement, backfilling and shaping, grading and forming.	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	24	$534.96	Backhoe operator	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	24	$1,056.00	Contract supervisor	
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	1	$285.90		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	3
Scenario Name	Inlet+Reception pit (> 5000 gal)
Scenario Description	Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume greater than 5000 gallons such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this pit is intended to be transferred to final storage within a 48 hour period. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.
After Practice Situation	This practice scenario is suitable where the estimated maximum design volume for wastewater collected is greater than 5000 gallons of liquid waste within 48 hours or before it is stored or treated. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters inlet area to collect liquid slurry waste and the installation of an 12 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling and 150' of 6" pipe to transfer to final location. Transfer pump if needed must be contracted under pumping plant, PS 533.
Scenario Feature Measure	Collection volume installed
Scenario Unit	Gallon
Scenario Typical Size	8600

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$469.20	$0.05
Equipment/Installation	$17,746.16	$2.06
Labor	$4,296.48	$0.50
Mobilization	$962.06	$0.11
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$23,473.90	$2.73

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1725	Safety chain tractor barrier	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	$2.78	60	$166.80	Safety material installation required by practice standard	Chain barrier for perimeter of reception pit to prevent people, equipment or animals from falling in.
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	15	$302.40	Subgrade for concrete inlet slab and catch basin bedding	Subgrade development area total for pit floor and slab.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	32	$1,443.20	Backhoe for excavation of reception pit and backfilling	
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	16	$752.96	Tractor for hauling material	
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	12	$658.08	Dozer for shaping and grading site for slab construction and designed drainage grades	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	22	$11,273.90	Cast in place concrete floor and walls to develop wastewater reception pit and curbing along slab.	Wastewater reception pit sized at 12 ft. wide by 16 ft. long and 6 ft. deep. The walls are 8 inches thick with 4 ft. footers. This quantity also includes the formation of 2 ft. curbs along the slab for containment.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	11	$3,549.70	Inlet slab area	Inlet slab estimated at 36 ft. x 22 ft. reinforced slab on grade with the reception pit at the low corner.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	40	$1,760.00	Contract supervisor	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	32	$713.28	Backhoe operator	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	80	$1,823.20	Crew hours for precast basin placement, backfilling and shaping, grading and forming.	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	4
Scenario Name	Medium collection basin with 6" transfer line
Scenario Description	Installation for a wastewater collection system that includes materials and structures to collect a design volume between 1000 and 5000 gallons of liquids such as silage leachate, lot runoff and other contaminated liquid effluent which is then transferred through a 6" low pressure conduit to the waste storage structure. This scenario includes a reinforced concrete manure reception pit and a 6" PVC SDR 41 conduit to transfer the manure and wastewater to a waste storage pond. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.
After Practice Situation	This practice scenario is for the estimated design volume for waste collection and transfer of 4300 gallons of liquid waste and can be transferred under gravity or low pressure flow in a 6" PVC pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters at the basin to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The transfer pipeline is assumed to be 300 feet long, 6" PVC gasketted SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.
Scenario Feature Measure	Collection volume installed
Scenario Unit	Gallon
Scenario Typical Size	4300

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$1,589.48	$0.37
Equipment/Installation	$11,796.62	$2.74
Labor	$4,309.12	$1.00
Mobilization	$962.06	$0.22
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$18,657.28	$4.34

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	984	Pipe, PVC, 6", SDR 41	Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$3.38	330	$1,115.40	Includes the pipe, inlet, outlet, risers, all valves, thrust blocks and all other fittings for pipeline installation.	Pipeline length includes 10% for fittings used for typical scenario.
Materials	1725	Safety chain tractor barrier	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	$2.78	40	$111.20	Safety material installation required by practice standard	Chain barrier for perimeter of reception pit to prevent people, equipment or animals from falling in.
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	18	$362.88	Subgrade for concrete inlet slab and catch basin bedding and pipe bedding	Subgrade development area total for pit floor, slab and pipe length.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	32	$1,443.20	Backhoe for excavation of reception pit, pipe trench and backfilling	
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	16	$752.96	Tractor for hauling material	
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	8	$438.72	Dozer for shaping and grading site for slab construction and designed drainage grades	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	14	$7,174.30	Cast in place concrete floor and walls to develop wastewater reception pit and curbing along slab.	Wastewater reception pit sized at 12 ft. wide by 8 ft. long and 6 ft. deep. The walls are 8 inches thick with 4 ft. footers. This quantity also includes the formation of 2 ft. curbs along the slab for containment.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	6	$1,936.20	Inlet slab area	Inlet slab estimated at 22 ft. x 18 ft. reinforced slab on grade with the reception pit at the low corner.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	3	$51.24	Site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	32	$1,408.00	Contract supervisor	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	32	$713.28	Backhoe operator	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	96	$2,187.84	Crew hours for shaping and grading, forming and finishing of reception pit, backfilling. Includes pipeline connections and installation.	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	5
Scenario Name	Large collection basin with 6" to 8" transfer line
Scenario Description	Installation for a wastewater collection system that includes materials and structures to collect liquids such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this 8600 gallon pit is intended to be transferred to final storage within a 48 hour period. The waste is transferred through an 8" conduit to a waste treatment location. After treatment the remaining liquids are transferred to the waste storage pond in a 6" pipeline. This scenario includes a reinforced concrete manure reception pit an 8" conduit to transfer the manure and wastewater to a treatment location and a secondary 6" transfer pipeline. Reception Pit includes safety fence w/gate or solid/grated cover. The 8" transfer conduit and 6" transfer pipeline consists of the pipe plus the inlet structures connections and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP. Additional waste treatment is required for the waste stream prior to reaching in the waste storage pond.
After Practice Situation	This practice scenario is suitable where the estimated design volume for waste collection and transfer is greater than 5000 gallons of liquid waste and can be transferred under gravity or low pressure flow in an 8" conduit to a waste treatment site. Then the remaining liquids will be transferred in a 6" pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The first stage transfer pipeline is assumed to be 200 feet long, 8" PVC gasketted SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design. The second stage transfer pipe is assumed to be 500 feet long 6" PVC gasketted SDR 41 pipe with an adapter for the wastewater treatment system, couplers, air-vac vents, all other fittings placed as specified by the
Scenario Feature Measure	Collection volume installed
Scenario Unit	Gallon
Scenario Typical Size	8600

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$4,415.58	$0.51
Equipment/Installation	$18,483.44	$2.15
Labor	$5,663.88	$0.66
Mobilization	$962.06	$0.11
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$29,524.96	$3.43

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	984	Pipe, PVC, 6", SDR 41	Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$3.38	220	$743.60	Includes the pipe, inlet, outlet, risers, all valves, thrust blocks and all other fittings for pipeline installation.	Pipeline length includes 10% for fittings used for typical scenario.
Materials	985	Pipe, PVC, 8", SDR 41	Materials: - 8" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$5.53	550	$3,041.50	Includes the pipe, inlet, outlet, risers, all valves, thrust blocks and all other fittings for pipeline installation.	Pipeline length includes 10% for fittings used for typical scenario.
Materials	1725	Safety chain tractor barrier	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	$2.78	60	$166.80	Safety material installation required by practice standard	Chain barrier for perimeter of reception pit to prevent people, equipment or animals from falling in.
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	23	$463.68	Subgrade for concrete inlet slab and catch basin bedding	Subgrade development area total for pit floor and slab.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	40	$1,804.00	Backhoe for excavation of reception pit and backfilling	
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	24	$1,129.44	Tractor for hauling material	
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	12	$658.08	Dozer for shaping and grading site for slab construction and designed drainage grades	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	22	$11,273.90	Cast in place concrete floor and walls to develop wastewater reception pit and curbing along slab.	Wastewater reception pit sized at 12 ft. wide by 16 ft. long and 6 ft. deep. The walls are 8 inches thick with 4 ft. footers. This quantity also includes the formation of 2 ft. curbs along the slab for containment.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	11	$3,549.70	Inlet slab area	Inlet slab estimated at 36 ft. x 22 ft. reinforced slab on grade with the reception pit at the low corner.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	40	$1,760.00	Contract supervisor	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	32	$713.28	Backhoe operator	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	140	$3,190.60	Crew hours for shaping and grading, forming and finishing of reception pit, backfilling. Includes pipeline connections and installation.	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	6
Scenario Name	Concrete channel
Scenario Description	Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable th facility manager to direct liquid waste to an existing collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.
After Practice Situation	Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility. Includes safety chain for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.
Scenario Feature Measure	Bottom surface area of concrete channel
Scenario Unit	Square Foot
Scenario Typical Size	1200

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$1,324.16	$1.10
Equipment/Installation	$13,243.39	$11.04
Labor	$3,960.64	$3.30
Mobilization	$571.80	$0.48
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$19,099.99	$15.92

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1952	Safety gate, span manure transfer channel or chute	Safety gate to span manure transfer channel at push off wall or chute outlet. Minium of 4' tall with openings that will not pass a 6" or lager sphere. Materials and shipping only.	Foot	$50.00	16	$800.00	Safety feature where required by practice standard	
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	26	$524.16	Gravel required for subgrade.	Typical subgrade depth is 6 inches under all concrete structures.
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	8	$438.72	Dozer to grade and shape the site for slab construction and designed drainage grades.	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	11	$5,636.95	Curbs 2 ft high with 1 ft footer on both sides of the slab for containment.	Curbs are designed to contain the wastewater flow and withstand impacts from regular maintenance activities.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	22	$7,099.40	Concrete channel-slab-on-grade type design	Channel is 100 ft long and 12 ft wide. Slab is designed with steel reinforcement for temperature and shrinkage.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	50	$2,200.00	Contract supervisor	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	8	$302.08	Equipment operator to develop site drainage grades.	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	64	$1,458.56	Crew hours for shaping, grading, forming and finishing.	
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	7
Scenario Name	Concrete channel to Pushoff=> 20LF
Scenario Description	Installation of a long concrete channel (=> 20 LF)that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a push-off ramp and into a waste storage facility . A safety gate is installed at the end of the push-off ramp. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.
After Practice Situation	Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The push-off ramp is a concrete cantilever structure that allows the waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.
Scenario Feature Measure	Bottom surface area of concrete channel
Scenario Unit	Square Foot
Scenario Typical Size	1200

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$574.16	$0.48
Equipment/Installation	$16,335.17	$13.61
Labor	$4,735.50	$3.95
Mobilization	$571.80	$0.48
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$22,216.63	$18.51

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1952	Safety gate, span manure transfer channel or chute	Safety gate to span manure transfer channel at push off wall or chute outlet. Minium of 4' tall with openings that will not pass a 6" or lager sphere. Materials and shipping only.	Foot	$50.00	1	$50.00	Safety feature where required by practice standard	
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	26	$524.16	Gravel required for subgrade.	Typical subgrade depth is 6 inches under all concrete structures.
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	8	$438.72	Dozer to grade and shape the site for slab construction and designed drainage grades.	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	17	$8,711.65	Concrete cantilever structure and curbs 2 ft high with 1 ft footer on both sides of the slab for containment.	Curbs are designed to contain the wastewater flow and withstand impacts from regular maintenance activities.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	22	$7,099.40	Concrete channel-slab-on-grade type design	Channel is 100 ft long and 12 ft wide. Slab is designed with steel reinforcement for temperature and shrinkage.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	5	$85.40	Site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	50	$2,200.00	Contract supervisor	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	8	$302.08	Equipment operator to develop site drainage grades.	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	98	$2,233.42	Crew hours for shaping, grading, forming and finishing.	
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	8
Scenario Name	Concrete channel to Basin
Scenario Description	Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable th facility manager to direct liquid waste to a 4300 gallon wastewater collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.
After Practice Situation	Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to a 8'x12'x6' collection basin or waste storage facility. Includes safety chain around the basin for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.
Scenario Feature Measure	Bottom surface area of concrete channel
Scenario Unit	Square Foot
Scenario Typical Size	1200

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$703.48	$0.59
Equipment/Installation	$20,475.19	$17.06
Labor	$6,211.84	$5.18
Mobilization	$962.06	$0.80
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$28,352.57	$23.63

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	28	$564.48	Gravel required for subgrade.	Typical subgrade depth is 6 inches under all concrete structures.
Materials	1725	Safety chain tractor barrier	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	$2.78	50	$139.00	Safety feature where required by practice standard	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	23	$11,786.35	Cast in place 8'x12'x6', 4300 gallon reinforced concrete basin. Curbs 2 ft high with 1 ft footer on both sides of the slab for containment.	Curbs are designed to contain the wastewater flow and withstand impacts from regular maintenance activities.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	22	$7,099.40	Concrete channel-slab-on-grade type design	Channel is 100 ft long and 12 ft wide. Slab is designed with steel reinforcement for temperature and shrinkage.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	24	$1,082.40	Pit excavation	
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	8	$438.72	Dozer to grade and shape the site for slab construction and designed drainage grades.	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	120	$2,734.80	Crew hours for shaping, grading, forming, backfilling and finishing.	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	24	$534.96	Backhoe operator	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	8	$302.08	Equipment operator to develop site drainage grades.	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	60	$2,640.00	Contract supervisor	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	9
Scenario Name	Concrete Channel to Basin to pipe
Scenario Description	Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable th facility manager to direct liquid waste to a 4300 gallon collection basin and/or waste storage facility. The wastewater is then transferred from the basin to the waste storage pond through a 6" diameter low pressure pipeline. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated. Waste transfer structures are needed to transfer wastes to a waste storage pond
After Practice Situation	Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The waste transfer scenario is to scrape liquids or manure slurry from the waste production area down the channel to a 8'x12'x6' collection basin. From the basin it is then transferred through a 6" pipe 500 feet to the waste storage pond. The scenario also includes a safety chain around the basin. The transfer pipe is a 6" diameter gasketted PVC SDR 41 low pressure pipeline. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom. Also pipe size may be increased to meet flow requirements.
Scenario Feature Measure	Bottom surface area of concrete channel
Scenario Unit	Square Foot
Scenario Typical Size	1200

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$2,562.48	$2.14
Equipment/Installation	$22,171.84	$18.48
Labor	$6,895.54	$5.75
Mobilization	$962.06	$0.80
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$32,591.92	$27.16

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	28	$564.48	Gravel required for subgrade.	Typical subgrade depth is 6 inches under all concrete structures.
Materials	1725	Safety chain tractor barrier	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	$2.78	50	$139.00	Safety feature where required by practice standard	
Materials	984	Pipe, PVC, 6", SDR 41	Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241	Foot	$3.38	550	$1,859.00	Includes the pipe, inlet, outlet, risers, all valves, thrust blocks and all other fittings for pipeline installation.	Pipeline length includes 10% for fittings used for typical scenario.
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	23	$11,786.35	Cast in place 8'x12'x6', 4300 gallon reinforced concrete basin. Curbs 2 ft high with 1 ft footer on both sides of the slab for containment.	Curbs are designed to contain the wastewater flow and withstand impacts from regular maintenance activities.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	22	$7,099.40	Concrete channel-slab-on-grade type design	Channel is 100 ft long and 12 ft wide. Slab is designed with steel reinforcement for temperature and shrinkage.
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	45	$241.65	Initial backfill around pipe	Backfill hand compacted up to 6" over pipe with 20% added for compaction.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	24	$1,082.40	Pit excavation	
Equipment/Installation	54	Trenching, Earth, loam, 24" x 48"	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.91	500	$1,455.00	Pipe trench	Pipe installation
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	8	$438.72	Dozer to grade and shape the site for slab construction and designed drainage grades.	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	150	$3,418.50	Crew hours for monitoring excavation grade and shaping, assembly of pipeline system, forming, backfilling and finishing installation and site clean-up	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	24	$534.96	Backhoe operator	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	8	$302.08	Equipment operator to develop site drainage grades.	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	60	$2,640.00	Contract supervisor	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	10
Scenario Name	Small Manure Flush System
Scenario Description	Installation of a manure and wastewater collection system that includes materials and structures to flush waste from a concrete surface into a collection basin and transferred to a waste storage pond. This small flush system must have an adequate source for the flush water and will use an 8" diameter pipe. The system may include flush water tank, piping and valves, concrete flush lane, concrete curbs or gutter, precast manholes, sumps or catch basins. The animal waste will be transferred by a flush cyle released from the flush tank to rinse the concrete surface and carry the waste to a collection basin, into a pipe and to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.
Before Practice Situation	A small animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and collect the waste materials deposited.
After Practice Situation	This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. The design flush volume for a small wastewater flush system is less than 1000 gallons and requires no more than 50 feet of an 8 inch diameter pressure pipe for the flush pipe. The scenario includes materials and installation of a flush tank, piping and valves to manage the flush flow, concrete flush lane, concrete curbs or gutters to transfer the flow to a collection basin. The liquids then flow from the basin to the waste storage pond, an estimated length of 200 feet and requires an 8 inch diameter low pressure pipeline with an open outlet to the waste storage pond. The cost includes excavation, placement of bedding aggregate as needed, forming and placement of structures, conveyance pipeline with valves and structural backfill. Pump must be contracted under pumping plant, PS 533.
Scenario Feature Measure	1000 Gallons of flush water
Scenario Unit	Gallon
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$4,621.06	$4.62
Equipment/Installation	$5,174.17	$5.17
Labor	$3,284.24	$3.28
Mobilization	$962.06	$0.96
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$14,041.53	$14.04

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	994	Pipe, PVC, 8", SDR 35	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	$6.50	220	$1,430.00	Assumed 200 feet conveyance pipeline to waste storage facility.	Includes 10% additional length for all appurtenances for pipeline structures.
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	15	$302.40	Subgrade for concrete slab, gutter and catch basin along with pipeline bedding estimate	7 CY for subgrade material and 8 CY estimated for pipe bedding
Materials	1754	Catch Basin, concrete, 60" dia.	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,306.21	1	$2,306.21	Precast catch basin with riser if needed to provided wastewater collection volume with collar adaptor and grate safety cover.	Volume up to 1000 gal. based on engineering evaluation.
Materials	988	Pipe, PVC, 8", SDR 21	Materials: - 8" - PVC - SDR 21 200 psi - ASTM D2241	Foot	$10.59	55	$582.45	Assumed 50 feet of pipeline for flush system from tank.	Includes 10% additional length for valve and all elbows Tees and thrust blocks for pipeline structures.
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	3	$1,537.35	Curb at flush outlet to direct flow and on 2 sides of inlet collection basin.	2 ft curbs with footer on two sides of inlet slab
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	7	$2,258.90	flush slab surface	flush slab assumed 6 ft wide, 50 feet long by 5 inch reinforced slab on grade. 2 ft. curbs with footer on two sides of collection basin.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	20	$902.00	Backhoe for excavation and placement of catch basin	
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$54.84	4	$219.36	Dozer for shaping and grading site for proper drainage	
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	4	$188.24	Tractor for hauling material	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	60	$1,367.40	Crew hours for precast basin placement, backfilling, shaping, grading and forming for gutter and slab. Crew time for pipeline placement also included.	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	20	$445.80	Backhoe operator	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	4	$151.04	Dozer operator	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	30	$1,320.00	Contract supervisor	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	11
Scenario Name	Pipe manure flush system
Scenario Description	Installation of the pipe for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a waste storage pond. This may include pipe and valves, concrete flush lane, concrete curbs or gutter. The animal waste will be transferred by recycled flush water through the pipe system to rinse the concrete production surface and carry the waste to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.
Before Practice Situation	An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.
After Practice Situation	This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete production surfaces. The pipe design for the flush volume requires100 feet of 12 inch diameter pipe for pressure flow. The flushed wastes are then piped from an existing collection basin to the waste storage pond an estimated length of 200 feet through a 12 inch diameter low pressure pipe with an open outlet at the pond. The cost includes excavation, placement of bedding as needed, flush and conveyance pipelines with valves and pipe backfill. Pumps must be contracted under pumping plant, PS 533.
Scenario Feature Measure	Flush - pipes
Scenario Unit	Feet
Scenario Typical Size	300

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$7,735.16	$25.78
Equipment/Installation	$4,733.82	$15.78
Labor	$4,026.90	$13.42
Mobilization	$962.06	$3.21
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$17,457.94	$58.19

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	6	$120.96	Subgrade for concrete slab repair.	
Materials	1717	Pipe, PVC, 12", SDR 21	Materials: - 12" - PVC - SDR 21 - ASTM D2241	Foot	$23.23	110	$2,555.30	Assumed 100 feet of pipeline for flush system from tank .	Includes 10% additonal length for any valve, riser and all elbows Tees and thrust blocks for pipeline structures.
Materials	1252	Pipe, PVC, 12", SDR 35	Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only.	Foot	$21.77	220	$4,789.40	Assumed 200 feet conveyance pipeline to waste storage facility	Includes 10% additional length for any valve and all elbows Tees and thrust blocks for pipeline structures.
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$26.95	10	$269.50	Pipe bedding	Pipe bedding depth of 0.5 ft.for 300 total feet of length.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	30	$1,353.00	Backhoe for excavation of pipe trench and final backfill.	
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Site preparation	Estimated
Equipment/Installation	962	Tractor, agricultural, 120 HP	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$47.06	8	$376.48	Tractor for hauling material	
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	66	$354.42	Initial backfill	This backfill is manually compacted around the pipe up to a depth of 1' over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	8	$2,581.60	flush slab surface	flush slab repair from pipe installation
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	40	$891.60	Backhoe operator	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	70	$1,595.30	Crew hours for precast basin placement, backfilling, shaping, grading and forming for gutter and slab. Crew time for pipeline placement also included.	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	35	$1,540.00	Contract supervisor	
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	12
Scenario Name	Hopper with > 40 ft of 24" pipe
Scenario Description	Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.
After Practice Situation	Install an 80 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.
Scenario Feature Measure	Length of pipe installed
Scenario Unit	Feet
Scenario Typical Size	80

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$4,303.58	$53.79
Equipment/Installation	$3,399.69	$42.50
Labor	$1,528.08	$19.10
Mobilization	$571.80	$7.15
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$9,803.15	$122.54

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$26.95	7	$188.65	Pipe bedding	Depth of bedding is 6".
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	7	$141.12	bedding for pipeline and hopper	Depth estimated at 6"
Materials	1754	Catch Basin, concrete, 60" dia.	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,306.21	1	$2,306.21	Inlet basin for collection of wastewater to funnel into gravity pipeline.	One hopper for gravity pipe inlet.
Materials	1246	Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$18.95	88	$1,667.60	Gravity pipeline. Includes the pipe, inlet, outlet, couplers and all other fittings for pipeline installation.	Pipeline length used for typical scenario. Additional 10% length to account for fittings, etc.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	4	$1,290.80	Site slab repair	Estimated - 80 ft x 4.5 ft
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	33	$177.21	Initial backfill around hopper and pipe and over pipe up to 12" depth	This backfill is manually compacted around the pipe up to a depth of 12" over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	4	$68.32	Installation site preparation	Estimated
Equipment/Installation	932	Hydraulic Excavator, 2 CY	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$155.28	12	$1,863.36	Dig trench and hole for hopper	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	24	$546.96	Crew hours for monitoring excavation grade, assembly of pipeline system installation and site clean-up	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	12	$453.12	Hydraulic operator	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	12	$528.00		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	13
Scenario Name	Hopper with < 40 ft of 24" pipe
Scenario Description	Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.
After Practice Situation	Install an 30 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.
Scenario Feature Measure	LF of 24" pipe
Scenario Unit	Foot
Scenario Typical Size	30

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$3,066.10	$102.20
Equipment/Installation	$1,708.87	$56.96
Labor	$751.56	$25.05
Mobilization	$571.80	$19.06
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$6,098.33	$203.28

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$26.95	2	$53.90	Pipe bedding	Depth of bedding is 6".
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	$20.16	4	$80.64	bedding for pipeline and hopper	Depth estimated at 6"
Materials	1754	Catch Basin, concrete, 60" dia.	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,306.21	1	$2,306.21	Inlet basin for collection of wastewater to funnel into gravity pipeline.	One hopper for gravity pipe inlet.
Materials	1246	Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$18.95	33	$625.35	Gravity pipeline. Includes the pipe, inlet, outlet, couplers and all other fittings for pipeline installation.	Pipeline length used for typical scenario. Additional 10% length to account for fittings, etc.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	2	$645.40	Site slab repair	
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	15	$80.55	Initial backfill around hopper and pipe and over pipe up to 12" depth	This backfill is manually compacted around the pipe up to a depth of 12" over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	3	$51.24	Installation site preparation	Estimated
Equipment/Installation	932	Hydraulic Excavator, 2 CY	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$155.28	6	$931.68	Dig trench and hopper area	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	12	$273.48	Crew hours for monitoring excavation grade, assembly of pipeline system installation and site clean-up	
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$37.76	8	$302.08	run Hy excavator	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	4	$176.00		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80	mob equipment	

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	14
Scenario Name	Transfer line, 30 in. diameter pipe
Scenario Description	Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an existing inlet structure or hopper with attachment to a smooth interior large diameter pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the pipe attachment to an existing inlet structure and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.
After Practice Situation	Install a 150 foot long 30" diameter water tight HDPE pipe to transfer manure by gravity from one location to another. A gravity transfer system typically consists of a sealed inlet at an existing waste collection structure to a smooth interior 30" sewer grade pipe that will gravity flow to an outlet a a site of manure treatment or storage. This scenario includes the pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. If required an inlet structure may be contracted under another scenario. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.
Scenario Feature Measure	Length of pipe installed
Scenario Unit	Feet
Scenario Typical Size	150

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$4,729.45	$31.53
Equipment/Installation	$6,715.75	$44.77
Labor	$2,642.62	$17.62
Mobilization	$44.18	$0.29
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$14,132.00	$94.21

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$26.95	13	$350.35	Pipe bedding	Depth of bedding is 6".
Materials	1247	Pipe, HDPE, CPT, Double Wall, Soil Tight, 30"	Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$26.54	165	$4,379.10	Includes the pipe, inlet, outlet, couplers and all other fittings for pipeline installation.	Pipeline length used for typical scenario. Additional 10% length to account for fittings, etc.
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	30	$1,353.00	Equipment for trenching and backfilling	
Equipment/Installation	51	Earthfill, Dumped and Spread	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	$3.29	45	$148.05	Final backfill over pipeline trench	This backfill is machine compacted to the ground surface with allowance for settlement. A 20% compaction factor is used for the volume est.
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	57	$306.09	Initial backfill around pipe and over pipe up to 6" depth	This backfill is manually compacted around the pipe up to a depth of 6" over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.17	125	$271.25	Trench excavation	Trench width is pipe width plus 1 foot on both sides, 4.5 ft.. Trench depth is pipe plus 2 ft of cover and bedding depth, 5 ft.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	14	$4,517.80	Site slab repair	Estimated - 150 ft x 5 ft
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	7	$119.56	Installation site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	20	$880.00	Contractor	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	30	$668.70	Backhoe operator	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	48	$1,093.92	Crew hours for monitoring excavation grade, assembly of pipeline system installation and site clean-up	
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.09	2	$44.18		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	15
Scenario Name	Transfer line, low-pressure 12"
Scenario Description	Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.
After Practice Situation	Install a 300 foot long 12 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipeflow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system. The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.
Scenario Feature Measure	Length of pipe installed
Scenario Unit	Feet
Scenario Typical Size	300

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$5,700.20	$19.00
Equipment/Installation	$6,700.34	$22.33
Labor	$3,227.84	$10.76
Mobilization	$44.18	$0.15
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$15,672.56	$52.24

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1716	Pipe, PVC, 12", SCH 40	Materials: 12" dia. PVC SCH 40, ASTM D1785	Foot	$16.13	330	$5,322.90	Includes the pipe, inlet, outlet, risers, all valves, thrust blocks and all other fittings for pipeline installation.	Pipeline length includes 10% for fittings used for typical scenario.
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$26.95	14	$377.30	Pipe bedding	Depth of bedding is 6".
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	32	$1,443.20	Equipment for trenching and backfilling	
Equipment/Installation	51	Earthfill, Dumped and Spread	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	$3.29	33	$108.57	Final backfill over pipeline trench	This backfill is machine compacted to the ground surface with allowance for settlement. A 20% compaction factor is used for the volume est.
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	56	$300.72	Initial backfill around pipe and over pipe up to 12" depth	This backfill is manually compacted around the pipe up to a depth of 12" over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.17	97	$210.49	Trench excavation	Trench width is pipe width plus 3/4 foot on both sides, 2.5 ft.. Trench depth is pipe plus 2 ft of cover and bedding depth, 3.5 ft.
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	14	$4,517.80	Site slab repair	Estimated - 300 ft x 2.5 ft
Equipment/Installation	1498	Demolition, concrete	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$17.08	7	$119.56	Installation site preparation	Estimated
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	24	$1,056.00	Contractor	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	32	$713.28	Backhoe operator	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	64	$1,458.56	Crew hours for monitoring excavation grade, assembly of pipeline system installation and site clean-up	
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.09	2	$44.18		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	16
Scenario Name	Transfer line, low-pressure 10"
Scenario Description	Low pressure flow pipeline used to transfer manure wastewater by a low pressure pump from the waste storage pond to the field where it is applied according to the CNMP. The pipeline moves the water from the pond through a buried mainline with low pressure outlets that spread the water on a vegetated treatment area or to a site where the water is applied through an existing field application system. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of 100 psi or less. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for
Before Practice Situation	The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.
After Practice Situation	Install a 1000 foot long 10 inch diameter PVC gasketted IPS pipe that has an SDR of 41 and is water tight under low pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pumping pressure and flow volume for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water
Scenario Feature Measure	Length of pipe installed
Scenario Unit	Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$17,490.00	$17.49
Equipment/Installation	$3,750.31	$3.75
Labor	$2,475.30	$2.48
Mobilization	$44.18	$0.04
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$23,759.79	$23.76

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1714	Pipe, PVC, 10", SDR 21	Materials: - 10" - PVC - SDR 21 - ASTM D2241	Foot	$15.90	1100	$17,490.00	Includes the pipe, inlet and outlet risers, couplers, air-vac vents, clean-outs and all other fittings for pipeline installation.	Pipeline length used for typical scenario plus 10%. 1000*1.10=1100 ft
Equipment/Installation	54	Trenching, Earth, loam, 24" x 48"	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.91	1000	$2,910.00	Pipeline installation	Digging trench for 6" diameter pipe installation
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	127	$681.99	Initial backfill only around pipe and over pipe up to 10" depth	This backfill is manually compacted around the pipe up to a depth of 10" over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	36	Concrete, CIP, formless, non reinforced	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$158.32	1	$158.32	Thrust blocks	Estimated
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	70	$1,595.30	Crew hours for monitoring excavation grade, assembly of pipeline system, installation and site clean-up	
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	20	$880.00	Contractor	
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.09	2	$44.18		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	17
Scenario Name	Transfer line, with pressure, 6"
Scenario Description	Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP. Pressure flow transfer pipelines can be between 3" and 12" diameter but 6" diameter is a commonly used pipe size. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketted joints to seal for the wastewater transfer. The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers spaced at 300 ft intervals for a traveler applicator. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario
Before Practice Situation	The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.
After Practice Situation	Install a 1000 foot long 6 inch diameter PVC gasketted IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.
Scenario Feature Measure	Length of pipe installed
Scenario Unit	Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$6,919.00	$6.92
Equipment/Installation	$3,551.62	$3.55
Labor	$2,475.30	$2.48
Mobilization	$44.18	$0.04
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$12,990.10	$12.99

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	987	Pipe, PVC, 6", SDR 21	Materials: - 6" - PVC - SDR 21 200 psi - ASTM D2241	Foot	$6.29	1100	$6,919.00	Includes the pipe, inlet and outlet risers, couplers, air-vac vents, clean-outs and all other fittings for pipeline installation.	Pipeline length used for typical scenario plus 10%. 1000*1.10=1100 ft
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	90	$483.30	Initial backfill only around pipe and over pipe up to 6" depth	This backfill is manually compacted around the pipe up to a depth of 6" over top of pipe. A 20% compaction factor is used for the volume est.
Equipment/Installation	36	Concrete, CIP, formless, non reinforced	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$158.32	1	$158.32	Thrust blocks	Estimated
Equipment/Installation	54	Trenching, Earth, loam, 24" x 48"	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.91	1000	$2,910.00	Pipeline installation	Digging trench for 6" diameter pipe installation
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	20	$880.00	Contractor	
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	70	$1,595.30	Crew hours for monitoring excavation grade, assembly of pipeline system, installation and site clean-up	
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.09	2	$44.18		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	18
Scenario Name	Agitator for mixing basin contents < 10 ft. deep.
Scenario Description	This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the production source to a storage facility for proper utilization. This agitator is typically no more than 15 HP and is used for smaller waste storage facilities that are less than 10 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.
Before Practice Situation	In this typical setting, the operator has a small waste storage structure from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.
After Practice Situation	The typical installation would be for a small manure 10 HP agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.
Scenario Feature Measure	Agitator for wastewater, installed
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$11,000.00	$11,000.00
Equipment/Installation	$0.00	$0.00
Labor	$464.53	$464.53
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$583.35	$583.35
Foregone Income	$0.00	$0.00
Total	$12,047.88	$12,047.88

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1768	Manure agitator, mixing depth less than 10 feet.	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$11,000.00	1	$11,000.00	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure	HP typically 7.5, 10 or 15 and used where mixing depth is less than 10 feet.
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.23	11	$464.53	Equipment installation by certified electrician	Electric hookup and appurtenances
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.67	5	$583.35	Critical for equipment operation and maintenance	Estimated

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	19
Scenario Name	Agitator for mixing basin contents 10 to 15 ft. deep
Scenario Description	This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 30 HP and is used where the waste storage facility tank or pond is between 10 and 15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.
Before Practice Situation	In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.
After Practice Situation	A typical installation would be for a medium 30 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.
Scenario Feature Measure	Agitator for wastewater, installed
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$17,000.00	$17,000.00
Equipment/Installation	$0.00	$0.00
Labor	$506.76	$506.76
Mobilization	$390.26	$390.26
Acquisition of Technical Knowledge	$583.35	$583.35
Foregone Income	$0.00	$0.00
Total	$18,480.37	$18,480.37

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1766	Manure agitator, mixing depth 10 to 15 feet deep	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$17,000.00	1	$17,000.00	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure	30 HP is typically used where mixing depth is between 10 and 15 feet.
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.23	12	$506.76	Equipment installation by certified electrician	Electric hookup and appurtenances
Mobilization	1138	Mobilization, small equipment	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	$195.13	2	$390.26		
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.67	5	$583.35	Critical for equipment operation and maintenance	Estimated

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	20
Scenario Name	Agitator for mixing basin contents > 15 feet deep
Scenario Description	This scenario is for a large manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 100 HP and is used where the waste storage facility tank or pond is greater than15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.
Before Practice Situation	In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.
After Practice Situation	A typical installation would be for a large 100 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This agitator is for a tank deeper than 15 feet and is part of an animal waste management system to address water quality concerns. This covers the cost of the agitator equipment materials and labor for the electrical hook-up.
Scenario Feature Measure	Agitator for wastewater, installed
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$25,000.00	$25,000.00
Equipment/Installation	$0.00	$0.00
Labor	$506.76	$506.76
Mobilization	$571.80	$571.80
Acquisition of Technical Knowledge	$583.35	$583.35
Foregone Income	$0.00	$0.00
Total	$26,661.91	$26,661.91

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1767	Manure agitator, mixing depth greater than 15 feet deep.	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$25,000.00	1	$25,000.00	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure	100 HP is typically used where mixing depth is greater than 15 feet.
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.23	12	$506.76	Equipment installation by certified electrician	Electric hookup and appurtenances
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	2	$571.80		
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.67	5	$583.35	Critical for equipment operation and maintenance	Estimated

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	22
Scenario Name	Short scrape, alley with push-off
Scenario Description	Installation of a short concrete channel (< 20 LF) that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility at the end of a push-off ramp. A safety gate is installed at the end of the push-off ramp. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.
Before Practice Situation	Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.
After Practice Situation	Typical installation of a 12 foot wide 15' long concrete channel that consists of a 8" thick concrete slab with curbing on each side of the slab that is 2' high, 8" thick with footing for the entire length. The push-off ramp ends with a Safety gate that swings to allow waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.
Scenario Feature Measure	Each
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$812.04	$812.04
Equipment/Installation	$3,051.30	$3,051.30
Labor	$132.58	$132.58
Mobilization	$285.90	$285.90
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$4,281.82	$4,281.82

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$28.01	4	$112.04		14x15x.5/27=4 CY
Materials	1952	Safety gate, span manure transfer channel or chute	Safety gate to span manure transfer channel at push off wall or chute outlet. Minium of 4' tall with openings that will not pass a 6" or lager sphere. Materials and shipping only.	Foot	$50.00	14	$700.00	2' wider then 12' pushoff	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	2	$1,024.90	2' high curb	2'x.67x30/27=1.5 use 2CY
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	6	$1,936.20	Floor	14x15x.67/27=5.2 use 6
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	2	$90.20	site prep	
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	2	$44.58		
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	2	$88.00		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	1	$285.90		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	23
Scenario Name	Lot runoff (inlet box, pipe and pump tank)
Scenario Description	Installation of a wastewater transfer system that includes materials and structures to transfer silage leachate, lot runoff and other contaminated liquid effluent to a waste storage structure or VTA via a pump or siphon system. This scenario includes a collection box or area to screen and direct flow into a pipe which flows to a small tank to hold a pump or siphon which then transfers the wastewater to a waste storage pond or Vegetated Treatment Area. The pump or siphon is contraced under PS 533, Pumping Plant. Distribution systems are contracted as part of the Vegetated Treatment Area PS 635. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS635, Vegetated Treatment Area This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	No method is inplace to collect and direct wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility oe VTA is required for the CNMP.
After Practice Situation	A small collection box is installed at an existing barnyard and waste is transferred under gravity in a 4" dia. PVC pipeline to a 1,000gallon pump tank. Elevations require pumping to a waste storage facility or VTA. Transfer pump must be contracted under pumping plant, PS 533.
Scenario Feature Measure	each
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$2,376.55	$2,376.55
Equipment/Installation	$1,747.85	$1,747.85
Labor	$356.32	$356.32
Mobilization	$195.13	$195.13
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$4,675.85	$4,675.85

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	1755	Collection box, with grate lid	Precast concrete box with grate lid for waste transfer sump. Typically 1000-2000 gallon capacity	Each	$1,904.05	1	$1,904.05	Temporary holding tank for pumping or dosing	
Materials	978	Pipe, PVC, 4", SCH 40	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.15	150	$472.50	Pipe from lot box to tank and tank to head of VTA or WSF	
Equipment/Installation	55	Trenching, Earth, clay, 24" x 48"	Trenching, earth, clay, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling and shoring/dewatering	Foot	$3.45	150	$517.50	Dig pipe	
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	4	$180.40	Install 1000 gallon tank	
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.37	40	$214.80	Backfill tank	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	1	$512.45	Collection box at HUA 2' high walls a total of 12 lf	2x12x.67/27=0.6 use 1CY
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	1	$322.70	Floor 6'x6'x.5	6x6x.5/27=.66 use 1
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	4	$89.16		
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.79	4	$91.16		
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	4	$176.00		
Mobilization	1138	Mobilization, small equipment	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	$195.13	1	$195.13		

Scenario Worksheet

Practice and Scenario Description:	
Information Type	**Data**
Region	Mid Atlantic
State	New Jersey
Discipline Group	Environmental Engineering
Practice Code/Name	634 - Waste Transfer
Scenario ID	24
Scenario Name	Lot runoff (box and pipe)
Scenario Description	Installation of a wastewater transfer system that includes materials and structures to transfer silage leachate, lot runoff and other contaminated liquid effluent to a waste storage structure or VTA via gravity. This scenario includes a collection box or area to screen and direct flow into a pipe that then carries the wastewater to a waste storage pond or Vegetated Treatment Area . Distribution systems are contracted as part of the Vegetated Treatment Area PS 635. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS635, Vegetated Treatment Area This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.
Before Practice Situation	No method is inplace to collect and direct wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility or VTA is required for the CNMP.
After Practice Situation	A small collection box is installed adjacent to an existing barnyard and liquid waste is transferred via gravity in a 4" dia. PVC pipeline to a waste storage facility or VTA. Typical systems distance is 300'.
Scenario Feature Measure	each
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$945.00	$945.00
Equipment/Installation	$880.25	$880.25
Labor	$194.75	$194.75
Mobilization	$285.90	$285.90
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$2,305.90	$2,305.90

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost	Component Justification	Quantity Justification
Materials	978	Pipe, PVC, 4", SCH 40	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$3.15	300	$945.00	Needed to transfer wastes underground	Typical site is 300' from source to storage or VTA
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$45.10	1	$45.10	Prep collection area	
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	$512.45	1	$512.45	Collection box at HUA 2' high walls a total of 12 lf	2x12x.67/27=0.6 use 1CY
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	$322.70	1	$322.70	Floor 6'x6'x.5	6x6x.5/27=.66 use 1
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.29	1	$22.29		
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$44.00	2	$88.00		
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.23	2	$84.46		
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$285.90	1	$285.90		