

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #1 - Incineration, < 400 lbs. Capacity

**Scenario Description:** This scenario consists of installing a manufactured Type IV incinerator designed to handle < 400 lbs of average daily mortality for the species and size of the operation. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** A 200 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is being handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

**Scenario Feature Measure:** Each Incinerator

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$12,235.22

**Scenario Cost/Unit:** \$12,235.22

**Cost Details**

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

**Equipment Installation**

|  |     |   |            |          |   |          |
|--|-----|---|------------|----------|---|----------|
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-place 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 | \$226.71 | 4 | \$906.83 |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.   | Cubic Yard | \$1.89   | 8 | \$15.13  |
| Hydraulic Excavator, 1 CY                            | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.  | Hour       | \$112.88 | 1 | \$112.88 |

**Materials**

|                           |      |   |            |            |     |            |
|---------------------------|------|---|------------|------------|-----|------------|
| Aggregate, Gravel, Graded | 46   | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.                            | Cubic Yard | \$40.43    | 4   | \$161.73   |
| Fuel Tank, Anchored       | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only.  | Gallon     | \$3.57     | 285 | \$1,016.50 |
| Incinerator, 200 lbs/day  | 1624 | Poultry and livestock incinerator with an approximate chamber capacity of 200 pounds per day. Includes equipment and after burner only. | Each       | \$9,658.29 | 1   | \$9,658.29 |

**Labor**

|                            |     |  |      |         |   |         |
|----------------------------|-----|--|------|---------|---|---------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$20.76 | 1 | \$20.76 |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$20.07 | 1 | \$20.07 |

**Mobilization**

|                                      |      |  |                 |          |     |          |
|--------------------------------------|------|--|-----------------|----------|-----|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 200 | \$69.15  |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1   | \$253.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #2 - Incineration 400 - 600 lbs. Capacity

**Scenario Description:** This scenario consists of installing a manufactured Type IV incinerator designed to handle 400 to 600 lbs of average daily mortality for the species and size of the operation. Typically very large poultry or medium sized swine operations. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are reduced, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** A 400 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. In non-attainment areas, certain states may require a higher level of processing such as gasification or different methods. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Included is a concrete slab to set the incinerator on and a diesel fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

**Scenario Feature Measure:** Each Incinerator

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$14,026.89

**Scenario Cost/Unit:** \$14,026.89

**Cost Details**

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

**Equipment Installation**

|  |     |   |            |          |   |          |
|--|-----|---|------------|----------|---|----------|
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-place 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 | \$226.71 | 4 | \$906.83 |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.   | Cubic Yard | \$1.89   | 8 | \$15.13  |
| Hydraulic Excavator, 1 CY                            | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.  | Hour       | \$112.88 | 1 | \$112.88 |

**Materials**

|                           |      |   |            |             |     |             |
|---------------------------|------|---|------------|-------------|-----|-------------|
| Aggregate, Gravel, Graded | 46   | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.                            | Cubic Yard | \$40.43     | 4   | \$161.73    |
| Fuel Tank, Anchored       | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only.  | Gallon     | \$3.57      | 285 | \$1,016.50  |
| Incinerator, 400 lbs/day  | 1625 | Poultry and livestock incinerator with an approximate chamber capacity of 400 pounds per day. Includes equipment and after burner only. | Each       | \$11,449.96 | 1   | \$11,449.96 |

**Labor**

|                            |     |  |      |         |   |         |
|----------------------------|-----|--|------|---------|---|---------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$20.76 | 1 | \$20.76 |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$20.07 | 1 | \$20.07 |

**Mobilization**

|                                      |      |  |                 |          |     |          |
|--------------------------------------|------|--|-----------------|----------|-----|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 200 | \$69.15  |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1   | \$253.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #3 - Incineration > 600 lbs. Capacity

**Scenario Description:** This scenario consists of installing a manufactured Type IV incinerator designed to handle greater than 600 pounds daily mortality. Typically a single dairy cow or multiple heifers or swine. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. Select smallest incinerator that has a bin capacity to handle largest individual mortality. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** A 600 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. In non-attainment areas, certain states may require a higher level of processing such as gasification or other approved method. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulations. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers, a waste storage pit until land disposal as per the nutrient management plan or landfilled. Proper incineration will require between 15 and 25 gallons of diesel fuel per usage.

**Scenario Feature Measure:** Each Incinerator

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$15,889.80

**Scenario Cost/Unit:** \$15,889.80

**Cost Details**

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

**Equipment Installation**

|  |     |  |            |          |   |          |
|--|-----|--|------------|----------|---|----------|
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yard | \$226.71 | 4 | \$906.83 |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.  | Cubic Yard | \$1.89   | 8 | \$15.13  |
| Hydraulic Excavator, 1 CY                            | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.   | Hour       | \$112.88 | 1 | \$112.88 |

**Materials**

|                           |      |   |            |             |     |             |
|---------------------------|------|---|------------|-------------|-----|-------------|
| Aggregate, Gravel, Graded | 46   | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.                            | Cubic Yard | \$40.43     | 4   | \$161.73    |
| Fuel Tank, Anchored       | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only.  | Gallon     | \$3.57      | 285 | \$1,016.50  |
| Incinerator, 600 lbs/day  | 1626 | Poultry and livestock incinerator with an approximate chamber capacity of 600 pounds per day. Includes equipment and after burner only. | Each       | \$13,312.87 | 1   | \$13,312.87 |

**Labor**

|                            |     |  |      |         |   |         |
|----------------------------|-----|--|------|---------|---|---------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers  | Hour | \$20.76 | 1 | \$20.76 |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$20.07 | 1 | \$20.07 |

**Mobilization**

|                                      |      |  |                 |          |     |          |
|--------------------------------------|------|--|-----------------|----------|-----|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 200 | \$69.15  |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1   | \$253.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #13 - Composter with Storage, Nursery

**Scenario Description:** This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. In vessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. In vessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Nursery operation consists of 5,000 head building capacity with 3.5 turns per year and an average weight of 25 pounds and a mortality rate of 5%. The average daily mortality loss (ADL) is 60 lb/day and a primary stage composting time of 30 days is based on 5 times the square root of the maximum weight of the nursery pig (35 pounds). The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 355 ft<sup>3</sup>. Using a 10' x 8' x 5' bin (with an effective height of 4.5' for additional bedding for leachate absorption) with a volume of 360 cf, this operation requires 1 primary composting bin. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 1 - 400 cf bin is required. This small operation requires 3 (10' x 8' x 5') bins along with a storage area of 15' x 15' = 225 sf. Bins are sized to the nearest larger whole number of bins. Site preparation includes topsoil removal and grading, installing 4" of gravel, setting posts, installing concrete slab (4"), installing wooden walls and retaining planks.

**Scenario Feature Measure:** Pounds per Day Mortality

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 60

**Total Scenario Cost:** \$9,411.21

**Scenario Cost/Unit:** \$156.85

**Cost Details**

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

**Equipment Installation**

|  |     |  |             |          |     |            |
|--|-----|--|-------------|----------|-----|------------|
| Auger, Post driver attachment                        | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.  | Hour        | \$7.25   | 12  | \$87.05    |
| Concrete, CIP, formless, non reinforced              | 36  | 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  | \$111.73 | 4   | \$446.90   |
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yard  | \$226.71 | 6   | \$1,360.25 |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.  | Cubic Yard  | \$1.89   | 296 | \$559.71   |
| Geotextile, woven                                    | 42  | Woven Geotextile Fabric. Includes materials, equipment and labor   | Square Yard | \$2.19   | 55  | \$120.69   |
| Tractor, agricultural, 60 HP                         | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.  | Hour        | \$24.59  | 12  | \$295.03   |

**Materials**

|                           |    |  |            |         |   |          |
|---------------------------|----|--|------------|---------|---|----------|
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | \$40.43 | 6 | \$242.60 |
|---------------------------|----|--|------------|---------|---|----------|

|  |      |   |            |        |      |            |
|--|------|---|------------|--------|------|------------|
| Dimension Lumber, Treated                  | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners                    | Board Foot | \$0.89 | 1683 | \$1,504.40 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | \$1.59 | 576  | \$918.24   |

#### Labor

|                            |     |   |      |          |    |            |
|----------------------------|-----|---|------|----------|----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers   | Hour | \$20.76  | 12 | \$249.12   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.                                  | Hour | \$20.07  | 96 | \$1,926.68 |
| Specialist Labor           | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | \$100.14 | 10 | \$1,001.43 |

#### Mobilization

|                                      |      |  |                 |          |     |          |
|--------------------------------------|------|--|-----------------|----------|-----|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 300 | \$103.73 |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1   | \$253.88 |
| Mobilization, small equipment        | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.                                 | Each            | \$170.76 | 2   | \$341.51 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #14 - Composter with Storage, Finisher

**Scenario Description:** This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. In vessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. In vessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Finisher operation consists of 1065 head building capacity with 2.7 turns per year and an average weight of 140 pounds and a mortality rate of 4%. The average daily mortality loss (ADL) is 44 lb/day and a primary stage composting time of 72 days is based on 5 times the square root of the maximum weight of the finisher (210 pounds). The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 639 ft3. Using a 10' x 8' x 5' bin (with an effective height of 4' for additional bedding for leachate absorption) with a volume of 320 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 1 - 400 cf bin is required. This small operation requires 5 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Bins are sized to the nearest larger whole number of bins. Site preparation includes topsoil removal and grading, installing 6" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

**Scenario Feature Measure:** Pounds per Day Mortality

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 44

**Total Scenario Cost:** \$19,943.01

**Scenario Cost/Unit:** \$453.25

**Cost Details**

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

**Equipment Installation**

|  |     |  |             |          |     |            |
|--|-----|--|-------------|----------|-----|------------|
| Auger, Post driver attachment                        | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.  | Hour        | \$7.25   | 19  | \$137.82   |
| Concrete, CIP, formless, non reinforced              | 36  | 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  | \$111.73 | 7   | \$782.08   |
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yard  | \$226.71 | 20  | \$4,534.15 |
| Earthfill, Dumped and Spread                         | 51  | Earthfill, dumped and spread without compaction effort, includes equipment and labor   | Cubic Yard  | \$2.93   | 190 | \$557.11   |
| Earthfill, Roller Compacted                          | 49  | Earthfill, roller or machine compacted, includes equipment and labor   | Cubic Yard  | \$3.57   | 190 | \$678.98   |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.  | Cubic Yard  | \$1.89   | 806 | \$1,524.07 |
| Geotextile, woven                                    | 42  | Woven Geotextile Fabric. Includes materials, equipment and labor   | Square Yard | \$2.19   | 120 | \$263.32   |
| Tractor, agricultural, 60 HP                         | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.  | Hour        | \$24.59  | 19  | \$467.13   |

**Materials**

|  |      |   |            |         |      |            |
|--|------|---|------------|---------|------|------------|
| Aggregate, Gravel, Graded                  | 46   | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.            | Cubic Yard | \$40.43 | 20   | \$808.66   |
| Dimension Lumber, Treated                  | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners                    | Board Foot | \$0.89  | 2805 | \$2,507.33 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | \$1.59  | 912  | \$1,453.89 |

**Labor**

|                            |     |   |      |          |     |            |
|----------------------------|-----|---|------|----------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers   | Hour | \$20.76  | 19  | \$394.44   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.                                  | Hour | \$20.07  | 144 | \$2,890.02 |
| Specialist Labor           | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | \$100.14 | 20  | \$2,002.86 |

**Mobilization**

|                                      |      |  |                 |          |      |          |
|--------------------------------------|------|--|-----------------|----------|------|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 1000 | \$345.75 |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1    | \$253.88 |
| Mobilization, small equipment        | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.                                 | Each            | \$170.76 | 2    | \$341.51 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #15 - Composter with Storage, Sow

**Scenario Description:** This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. In vessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. In vessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Sow (farrow to wean) operation consists of 350 sows, average weight of 350 pounds and a sow mortality rate of 5% and each sow has 2.5 litters of 10 pigs each per year, average weight of 6 pounds, with a piglet mortality rate of 12%. The average daily mortality loss (ADL) of sows and piglets is 17 lb/day each for a total of 34 lb/day and a primary stage composting time of 94 days is based on 5 times the square root of the maximum weight of sow only (350 #). The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 637 ft<sup>3</sup>. Using a 10' x 8' x 5' bin (with an effective height of 4' for additional bedding for leachate absorption) with a volume of 320 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 1 - 400 cf bin is required. This small operation requires 5 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Bins are sized to the nearest larger whole number of bins. Site preparation includes topsoil removal and grading, installing 6" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

**Scenario Feature Measure:** Pounds per Day Mortality

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 34

**Total Scenario Cost:** \$19,943.01

**Scenario Cost/Unit:** \$586.56

**Cost Details**

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

**Equipment Installation**

|  |     |  |             |          |     |            |
|--|-----|--|-------------|----------|-----|------------|
| Auger, Post driver attachment                        | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.  | Hour        | \$7.25   | 19  | \$137.82   |
| Concrete, CIP, formless, non reinforced              | 36  | 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  | \$111.73 | 7   | \$782.08   |
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yard  | \$226.71 | 20  | \$4,534.15 |
| Earthfill, Dumped and Spread                         | 51  | Earthfill, dumped and spread without compaction effort, includes equipment and labor   | Cubic Yard  | \$2.93   | 190 | \$557.11   |
| Earthfill, Roller Compacted                          | 49  | Earthfill, roller or machine compacted, includes equipment and labor   | Cubic Yard  | \$3.57   | 190 | \$678.98   |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.  | Cubic Yard  | \$1.89   | 806 | \$1,524.07 |
| Geotextile, woven                                    | 42  | Woven Geotextile Fabric. Includes materials, equipment and labor   | Square Yard | \$2.19   | 120 | \$263.32   |
| Tractor, agricultural, 60 HP                         | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment  | Hour        | \$24.59  | 19  | \$467.13   |

|  |  |   |  |  |  |  |
|--|--|---|--|--|--|--|
|  |  | and power unit costs. Labor not included. |  |  |  |  |
|--|--|---|--|--|--|--|

**Materials**

|  |      |   |            |         |      |            |
|--|------|---|------------|---------|------|------------|
| Aggregate, Gravel, Graded                  | 46   | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.            | Cubic Yard | \$40.43 | 20   | \$808.66   |
| Dimension Lumber, Treated                  | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners                    | Board Foot | \$0.89  | 2805 | \$2,507.33 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | \$1.59  | 912  | \$1,453.89 |

**Labor**

|                            |     |   |      |          |     |            |
|----------------------------|-----|---|------|----------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers   | Hour | \$20.76  | 19  | \$394.44   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.                                  | Hour | \$20.07  | 144 | \$2,890.02 |
| Specialist Labor           | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | \$100.14 | 20  | \$2,002.86 |

**Mobilization**

|                                      |      |  |                 |          |      |          |
|--------------------------------------|------|--|-----------------|----------|------|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 1000 | \$345.75 |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1    | \$253.88 |
| Mobilization, small equipment        | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.                                 | Each            | \$170.76 | 2    | \$341.51 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #16 - Composter with Storage, Poultry

**Scenario Description:** This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. In vessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. In vessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Broiler operation consists of a 43000 head operation, average bird weight of 4 pounds, 6 flocks per year, and a mortality rate of 5%. The average daily mortality loss (ADL) is 141 lb/day and a primary stage composting time of 14 days is based on 5 times the square root of the maximum weight. The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 400 ft<sup>3</sup>. Using a 10' x 8' x 5' bin with a volume of 400 cf, this operation requires 1 primary composting bin. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 2 - 400 cf bin is required. This small operation requires a total of 4 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Site preparation includes topsoil removal and grading, installing 4" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

**Scenario Feature Measure:** Pounds per Day Mortality

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 141

**Total Scenario Cost:** \$14,684.74

**Scenario Cost/Unit:** \$104.15

**Cost Details**

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

**Equipment Installation**

|  |     |  |             |          |      |            |
|--|-----|--|-------------|----------|------|------------|
| Auger, Post driver attachment                        | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.  | Hour        | \$7.25   | 17   | \$123.32   |
| Concrete, CIP, formless, non reinforced              | 36  | 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  | \$111.73 | 5.5  | \$614.49   |
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yard  | \$226.71 | 18.5 | \$4,194.09 |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.  | Cubic Yard  | \$1.89   | 296  | \$559.71   |
| Geotextile, woven                                    | 42  | Woven Geotextile Fabric. Includes materials, equipment and labor   | Square Yard | \$2.19   | 110  | \$241.37   |
| Tractor, agricultural, 60 HP                         | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.  | Hour        | \$24.59  | 17   | \$417.96   |

**Materials**

|                           |    |  |            |         |      |          |
|---------------------------|----|--|------------|---------|------|----------|
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | \$40.43 | 12.5 | \$505.41 |
|---------------------------|----|--|------------|---------|------|----------|

|  |      |   |            |        |      |            |
|--|------|---|------------|--------|------|------------|
| Dimension Lumber, Treated                  | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners                    | Board Foot | \$0.89 | 2409 | \$2,153.36 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | \$1.59 | 816  | \$1,300.85 |

#### Labor

|                            |     |   |      |          |     |            |
|----------------------------|-----|---|------|----------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers   | Hour | \$20.76  | 17  | \$352.92   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.                                  | Hour | \$20.07  | 120 | \$2,408.35 |
| Specialist Labor           | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | \$100.14 | 10  | \$1,001.43 |

#### Mobilization

|                                      |      |  |                 |          |     |          |
|--------------------------------------|------|--|-----------------|----------|-----|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 625 | \$216.10 |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1   | \$253.88 |
| Mobilization, small equipment        | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.                                 | Each            | \$170.76 | 2   | \$341.51 |

**Practice:** 316 - Animal Mortality Facility

**Scenario:** #17 - Composter with Storage, Turkey

**Scenario Description:** This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. In vessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. In vessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:** Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:** Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Tom Turkey operation consists of a 1480 head operation, maximum bird weight of 42 pounds, 112 day flock life, and a mortality rate of 12%. The average daily mortality loss (ADL) is 67 lb/day and a primary stage composting time of 32 days is based on 5 times the square root of the maximum weight. The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 432 ft3. Using a 10' x 8' x 5' bin with a volume of 400 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. Tertiary treatment will occur in the storage area. This small operation requires a total of 4 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. (Bins are sized to the nearest larger whole number of bins). Site preparation includes topsoil removal and grading, installing 4" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

**Scenario Feature Measure:** Pounds per Day Mortality

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 67

**Total Scenario Cost:** \$14,684.74

**Scenario Cost/Unit:** \$219.18

**Cost Details**

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

**Equipment Installation**

|  |     |  |             |          |      |            |
|--|-----|--|-------------|----------|------|------------|
| Auger, Post driver attachment                        | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.  | Hour        | \$7.25   | 17   | \$123.32   |
| Concrete, CIP, formless, non reinforced              | 36  | 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  | \$111.73 | 5.5  | \$614.49   |
| Concrete, CIP, slab on grade, reinforced             | 37  | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yard  | \$226.71 | 18.5 | \$4,194.09 |
| Earthfill, Dumped and Spread                         | 51  | Earthfill, dumped and spread without compaction effort, includes equipment and labor   | Cubic Yard  | \$2.93   | 0    | \$0.00     |
| Earthfill, Roller Compacted                          | 49  | Earthfill, roller or machine compacted, includes equipment and labor   | Cubic Yard  | \$3.57   | 0    | \$0.00     |
| Excavation, Common Earth, side cast, small equipment | 48  | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.  | Cubic Yard  | \$1.89   | 296  | \$559.71   |
| Geotextile, woven                                    | 42  | Woven Geotextile Fabric. Includes materials, equipment and labor   | Square Yard | \$2.19   | 110  | \$241.37   |
| Tractor, agricultural, 60 HP                         | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.  | Hour        | \$24.59  | 17   | \$417.96   |

**Materials**

|  |      |   |            |         |      |            |
|--|------|---|------------|---------|------|------------|
| Aggregate, Gravel, Graded                  | 46   | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.            | Cubic Yard | \$40.43 | 12.5 | \$505.41   |
| Dimension Lumber, Treated                  | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners                    | Board Foot | \$0.89  | 2409 | \$2,153.36 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | \$1.59  | 816  | \$1,300.85 |

**Labor**

|                            |     |   |      |          |     |            |
|----------------------------|-----|---|------|----------|-----|------------|
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers   | Hour | \$20.76  | 17  | \$352.92   |
| General Labor              | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.                                  | Hour | \$20.07  | 120 | \$2,408.35 |
| Specialist Labor           | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | \$100.14 | 10  | \$1,001.43 |

**Mobilization**

|                                      |      |  |                 |          |     |          |
|--------------------------------------|------|--|-----------------|----------|-----|----------|
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | \$0.35   | 625 | \$216.10 |
| Mobilization, medium equipment       | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.  | Each            | \$253.88 | 1   | \$253.88 |
| Mobilization, small equipment        | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.                                 | Each            | \$170.76 | 2   | \$341.51 |