

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

ANIMAL MORTALITY FACILITY

(No.)

CODE 316

DEFINITION

An on-farm facility for the treatment or disposal of livestock and poultry carcasses.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Decrease nonpoint source pollution of surface and groundwater resources;
- Reduce the impact of odors that result from improperly handled animal mortality;
- Decrease the likelihood of the spread of disease or other pathogens that result from the interaction of animal mortality and predators;
- To provide contingencies for normal and catastrophic mortality events.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where animal carcass treatment or disposal must be considered as a component of a waste management system for livestock or poultry operations. It applies where on-farm carcass treatment and disposal are permitted by federal, state, and local laws, rules, and regulations. It also applies where a waste management system plan as described in the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) has been developed that accounts for the end use of the product from the mortality facility. This practice includes disposal of both normal and catastrophic animal mortality; however, it does

not apply to catastrophic mortality resulting from disease.

CRITERIA

Animal mortality facilities and processes must conform to all federal, state, and local laws, rules, and regulations.

Laws and regulations of particular concern include those involving odor, water, and drainage rights, zoning, land use, pollution control, property easements, wetlands, endangered species, and preservation of cultural resources. Applicable provisions for operating, closing, and/or removing the facility also must be carefully followed.

Any Concentrated Animal Feeding Operation (CAFO) required to obtain coverage under the South Dakota (SD) Department of Environment and Natural Resources (DENR) General Water Pollution Control Permit for CAFO or that obtains an individual permit and is planning to construct a mortality management facility that could have discharge to waters of the state, must submit plans and specifications for that system to SD DENR for review and approval. For these facilities, any composted mortalities that will be land applied must be land applied in accordance with an operation's approved nutrient management plan and their DENR permit. Mortality management facility plans and specifications are not required to be submitted to SD DENR if the operation does not need SD DENR permit coverage.

All structural components shall meet the structural loads and design criteria in the Natural Resources Conservation Service (NRCS) Conservation Practice Standard

Waste Storage Facility (313), unless otherwise designated.

Surface runoff must be diverted away from the animal mortality facility wherever feasible.

Location. The location shall minimize odors and other air quality issues affecting inhabited areas, and shall minimize impacts on surface and ground water resources.

Animal mortality facilities must be located at least 1,000 feet from existing public water wells, 250 feet from wells and drinking water sources not owned by the producer, and 150 feet from wells and drinking water sources owned by the producer. Animal mortality facilities shall be located outside the 100-year floodplain. Where practical, the facility shall be down gradient from springs and wells.

The location of the animal mortality facility shall be consistent with the overall site plan for the operation.

Seepage Control. Where seepage from mortality facilities will create a potential water quality problem, use AWMFH, Appendix 10D, for clay liner design criteria, or other acceptable liner technology approved by the SD DENR.

ADDITIONAL CRITERIA FOR NORMAL MORTALITY

The facility shall be located as close to the source of mortality as practical, considering bio-security issues and the need to keep the facility out of sight of the general public.

Composters.

Design of facilities for composting animal mortality shall conform to Conservation Practice Standard, Composting Facility (317). Guidance is available in National Engineering Handbook (NEH), Part 637, Chapter 2 – Composting (NEH 637.0211, Dead Animal Composting).

General. Freezer units shall be compatible with filling and emptying procedures and equipment. Protect freezer units from weather.

The freezer unit installation shall meet the manufacturer's recommendations. Freezers shall be constructed of durable materials having a life expectancy compatible with other

aspects of the waste management system. The freezer container shall be leak proof to minimize odor and leachate pollution.

Freezer floors and work areas must be designed to withstand filling and emptying equipment loads.

Temperature. Freezers shall be designed to freeze animal carcasses before decomposition occurs. Carcass temperature shall be maintained below 26⁰F.

Capacity. Freezer units shall be sized to accommodate the normal maximum volume of mortality to be expected in the interval between emptying. Volume calculations shall include the expected mortality rate of the animal, the period of time between emptying where mortality is given on a per day basis, the average weight of the animal between emptying, and a conversion factor for weight to volume. For broiler operations, use a weight to volume conversion of a minimum of 45 pounds per cubic foot. Capacity calculations shall be supported by a removal schedule supplied by an integrator or approved vendor.

Power Source. An alternative source of power, where available, shall be used to maintain the integrity of the freezing process during power outages. Where an alternative power source will not be available, the Operation and Maintenance Plan (O&M) shall contain contingencies for mortality disposal.

Disposal Pit.

General. Disposal pits shall not be located on sites with a seasonal high water table less than two feet from the bottom of the pit. Pits located in highly permeable soils, or within two feet of fractured or cavernous rock, shall be lined with a liner approved by the SD Animal Industry Board.

Size and Capacity. Pits shall be sized to accommodate the normal mortality and meet SD Animal Industry Board and local regulatory agency criteria. The disposal pit shall be a minimum of four feet wide and four feet long. No minimum depth is required, but the selected depth shall accommodate two feet of cover over the mortality. Multiple pits shall be separated by a minimum of three feet of undisturbed or compacted soil.

Structural Loading and Design. Vehicular traffic shall not be allowed within four feet of the pit structure. Fences or other barriers shall be used to exclude vehicles where necessary.

The disposal pit shall be cased with masonry blocks, treated timber, or a pre-cast concrete septic tank conforming to American Society of Testing Materials (ASTM) C1227-00b Standard Specification for Pre-cast Septic Tanks. In all cases, the bottom of the pit shall remain exposed to the soil. If the pre-cast septic tank is used, it shall be fabricated with three six-inch openings in each end, and five six-inch openings in each side. When masonry block are used, every fourth block in each course shall be laid sideways (openings toward the outside) except the top and bottom courses. The bottom course shall be on a reinforced concrete footing of at least one foot wide and six inches thick. When treated timbers are used for walls, a one-inch spacing shall be left between timbers.

For pits that are 4 to 5 feet deep, a step or bench 18 inches wide and 1 foot deep shall be dug around the perimeter of the main pit so the remaining vertical wall shall not exceed 4 feet. For pits greater than five feet deep, the earthen wall shall be sloped back at 1 1/2 horizontal and 1 vertical or flatter.

The top of a disposal pit shall be covered with a slab constructed of reinforced concrete or treated timber having an appropriately sized hole for a drop chute. A pit over eight feet long shall have drop chutes every five feet and a minimum of two drop chutes. The drop chutes shall be appropriately covered and made of drainage tile, or concrete, clay, or polyvinyl chloride (PVC) pipe. A 10-inch opening is recommended for chickens, and a 12-inch opening for turkeys and suckling pigs.

Incinerators.

General. Incinerators shall be dual burning Type 4 (human and animal remains) approved for use in SD. Incinerators must receive an air quality permit from the SD DENR Air Quality Program, or have a determination made by the SD DENR Air Quality Program that an air quality permit is not required.

Capacity. Minimum incinerator capacity shall be based on the average daily weight of animal mortality and the length of time the incinerator will be operated each day.

Location. The incinerator shall be located a minimum of 20 feet from any structure. The incinerator shall be placed on a concrete pad with the fuel source as distant as practical. If the incinerator is covered with a roof, at least six inches are required between the incinerator chimney and any combustible roof parts.

ADDITIONAL CRITERIA FOR CATASTROPHIC MORTALITY

Processes addressed by this standard shall be limited to burial and composting. Catastrophic mortality shall be collected as soon as practical and moved away from the production facility.

Location. The facility shall be located as far away from neighboring dwellings and the livestock operation as site conditions permit. Locate on sites with restricted percolation and a minimum of two feet between the bottom of the facility and the seasonal high water table unless special design features are incorporated that address seepage rates and non-encroachment of contaminants into the water table. Use AWMFH Appendix 10D for selection of sites where seepage will be restricted with normal construction techniques.

Burial Pit

General. Catastrophic mortality resulting from natural conditions such as temperature extremes shall be buried as directed by the SD Animal Industry Board and local regulatory agencies. Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law, mortality shall remain uncovered or lightly covered until bloating has occurred, or methods employed to reduce or eliminate bloating. Topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is completed. Stockpiled soil shall be no closer than 20 feet from the edge of the burial pit.

Size and Capacity. Pits shall be sized to accommodate catastrophic mortality using appropriate weight to volume conversions. Capacity shall be in accordance with criteria acceptable to the SD Animal Industry Board and local regulatory agencies. The burial pit shall be a minimum of four feet wide with length necessary to accommodate mortality. Depth shall accommodate a minimum of two feet of cover over the mortality. Pit bottoms shall be relatively level. Lengths may be limited by soil suitability and slope. If more than one pit is required, they shall be separated by a minimum of three feet of undisturbed or compacted soil. The burial site shall be of sufficient volume to contain the mortality with a minimum of two feet of soil cover. The burial site shall be finish graded to slightly above natural ground elevation to accommodate settling.

Structural Loading and Design. Vehicular traffic shall not be allowed within four feet of the pit edge, except for burial pit construction, loading, and covering with soil.

For pits greater than four feet deep, the earthen wall shall be sloped back at one and one-half horizontal and one vertical or flatter.

Composting

General. Catastrophic mortality composting shall be in either passive piles or windrows as described in NEH, Part 637, Chapter 2 – Composting (NEH 637.0210 and NEH 637.0211). Catastrophic mortality that is composted shall meet the criteria of SD DENR, SD Animal Industry Board, and local regulatory agencies.

Composting mortality shall be protected from precipitation as necessary, or provisions made for collecting contaminated runoff. Static piles or windrows covered with sawdust, finished compost, or other benign material may not need further protection.

CONSIDERATIONS

Major considerations in planning animal mortality management are:

- Available equipment at the operation;
- The management capabilities of the operator;

- The degree of pollution control required by state and local agencies;
- The economics of the available alternatives; and
- Effect on neighbors.

Consideration should be given to prevailing wind direction and neighbors when siting animal mortality disposal facilities. Composting of poultry mortality will be hindered if the bird carcasses are allowed to freeze. Birds should be kept in a dry, non-freezing environment until added to the compost mix.

Facility sizes for composting large animal carcasses should reflect the longer compost periods required.

The following table lists factors that could be used in determining minimum daily weight of animal mortality when sizing incinerators:

TYPE OF ANIMAL	DAILY LOSS FACTOR (pounds/day/animal)
Chicken:	
Broilers	0.0024
Laying hens	0.0014
Breeding hens	0.0019
Breeder, male	0.0082
Turkeys:	
Hen	0.0081
Tom, light	0.0193
Tom, feather production	0.0286
Swine:	
Suckling pigs (per sow)	0.0400

Poultry operations often experience higher rates of mortality as the birds reach maturity. The capacity of incinerators should be sized to insure the mortality of the large birds can be handled within the timeframe allowed for incineration.

An alternative to prevent bloating of catastrophic mortality die off could include opening animal thoracic and abdominal cavities and viscera prior to placing required cover.

Incineration produces varying quantities of ash that will need to be properly handled.

Vegetative screens and topography can be used to shield the animal disposal facility from public view.

Follow the record keeping requirements of the SD DENR, SD Animal Industry Board, and local regulatory agencies.

Operators should maintain a list of current phone numbers for state and local officials to aid in notification if disease-related catastrophic mortality occurs.

Safety devices such as fencing, warning signs, and freezer locks may be necessary at certain sites.

Bio-security concerns should be addressed in all aspects of planning, installation, and O&M of an animal mortality facility.

Ground disturbing activities such as excavation and site preparation for disposal facilities have the potential to affect significant cultural resources.

OPERATION AND MAINTENANCE

An operation and maintenance plan applicable to this practice that includes, but is not limited to, the items listed below, will be developed with the owner/operator, and will become a part of the overall waste management system plan. The requirements in the individual operation and maintenance plan shall be consistent with the practice purposes, intended life, and design criteria. Safety and bio-security considerations shall be included.

Normal Mortality

Animal mortality facilities shall be regularly inspected to note any maintenance needs or indicators of operation problems.

Catastrophic Mortality

Possible locations for catastrophic animal mortality facilities shall be located during the planning process to be operated as needed.

Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law, mortality shall remain uncovered or lightly covered until bloating has occurred. Some topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is largely completed.

Where composting is used for catastrophic mortality disposal, the O&M plan shall identify the most likely compost medium, possible compost recipes, operational information, and equipment that will need to be readily available.

PLANS AND SPECIFICATIONS

Plans and specifications for animal mortality facilities shall be in keeping with this standard and shall describe the requirements for applying this practice to achieve its intended purpose.

REFERENCES

Agricultural Waste Management Field Handbook (AWMFH).

NEH, Part 637, Chapter 2, Composting.

NRCS General Manual 420, Part 401, Cultural Resources.

NRCS National Handbook of Conservation Practices.

ASTM C1227-00b Standard Specification for Pre-cast Septic Tanks.