**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 non-point 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

### General Criteria Applicable to All Purposes

The facility shall be designed to handle normal mortality and/or catastrophic mortality.

The planning and design of animal mortality facilities or processes must conform to all federal, State and local laws, rules and regulations. This includes provisions for closing and/or removing the facility where required, and securing all permits.

All structural components integral to animal mortality management shall meet the structural loads and design criteria as described in NRCS conservation practice standard 313, Waste Storage Facility, unless otherwise designated.

Where an animal mortality facility can be damaged by surface runoff, the runoff shall be diverted away from the facility.

**Location.** The location shall minimize the impact of the facility on odor and other air quality issues affecting neighboring residences, as well as minimizing the impact of the facility on surface and ground water resources. In addition, the facility, where practical, shall be generally down gradient from a spring or well. The animal mortality facility shall be located outside the 100 year floodplain; however if site restrictions require location within a floodplain, they shall be protected from inundation or damage.

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

**Seepage Control.** Where seepage from mortality facilities will create a potential water quality problem and it is deemed necessary to reduce seepage, use AWMFH, Appendix 10D, for clay liner design criteria, or other acceptable liner technology.

**Criteria Applicable to All Purposes – 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.

All buildings and structures shall comply with the North Carolina State Building Code for design and installation.

Auxiliary components such as grinders, blowers, piping systems, etc. shall be sized in accordance with the waste management plan developed for the operation. All components shall be certified by the manufacturer or supplier to comply with the site specific plans and specifications developed for the project.

**Composters**

**General.** Design of facilities for composting animal mortality shall conform to conservation practice standard 317, Composting Facility, or the guidance in National Engineering Handbook Part 637, Chapter 2 – Composting (NEH 637.0211, Dead Animal Composting).

**Freezers**

**General.** Freezer units shall be of the chest type with a construction compatible with the mechanism to be used to empty the freezer. Provisions for protecting the freezer unit from precipitation and direct sun shall be made as deemed appropriate.

The freezer unit design, construction, power source, and unit installation shall be in accordance with manufacturer's recommendations. Freezers shall be constructed of durable material with a life expectancy compatible with other aspects of the waste management system. The freezer container shall be leakproof to minimize odor and leachate pollution. The units must be sealed against weather and air leakage.

To provide for structural stability and safety, the freezer shall be placed on a firm, level foundation consisting of a concrete pad. The pad shall be at least 4 inches thick.

**Temperature.** The freezers shall be self-contained units designed with sufficient capacity to freeze animal carcasses before decomposition occurs and to maintain the temperature of the carcasses between $22^0$ and $26^0$ F. Freezers may be operated at a higher temperature, as a refrigerator/freezer unit, as required and in accordance with the Animal Mortality Disposal System planned and designed for the individual facility.

**Capacity.** Freezer units shall be sized to accommodate the maximum anticipated 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 maximum daily weight of the animal between emptying, and a conversion factor for weight to volume. The maximum daily weight of animal carcasses shall be based on mortality data over several growing cycles excluding catastrophic losses. In the absence of specific landowner mortality data, freezer capacity shall be based on similar operations in the local area. 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.

**Electrical Installation.** Electrical components and installation shall meet the requirements of the National Electrical Code (NEC) and state and local codes for outdoor installation. All electrical wiring shall be in a conduit. Installation shall be certified in writing by a qualified licensed electrician or a licensed electrical inspector.

**Alternative 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 shall contain contingencies for disposal of the poultry mortality.

**Location.** To minimize transfer of diseases when mortality is taken off farm, freezers shall

be located a sufficient distance away from buildings used to house the animals and residences. This minimum distance shall be 100 feet or as recommended by the state veterinarian, whichever is larger.

Freezers shall be located near all-weather roads to facilitate the loading and transporting of carcasses from the farm. Where needed, all-weather roads will be constructed to facilitate the equipment used in the removal of carcasses from the freezers. All-weather roads shall meet the requirements of NRCS Conservation Practice Standard Access Road, Code 560.

Freezers shall be located a sufficient height above normal ground to prevent surface water from posing a problem in the loading or unloading of the units. The site shall be graded to drain or divert all overland runoff safely away from the structure and surrounding work area.

**Safety.** Highly visible waterproof warning signs, such as “INEDIBLE” or similar signs shall be posted on the facility to identify the use of the freezer.

**Incinerators**

**General.** Incinerators shall be Type 4 (human and animal remains) approved for use within the state and shall have dual burn chambers.

Incinerators shall be constructed of durable material with a life expectancy equal to the planned life of the structure.

**Emissions.** Incinerator particular matter emissions, carbon monoxide (CO) emissions, and visible emissions shall not exceed the requirements of the North Carolina Division of Air Quality.

The incinerator shall not cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

The incinerator must comply with the visible emissions rule (for most of these incinerators, the opacity requirement is 20%) and the general odor rule is no objectionable odors beyond the farm boundary.

**Capacity.** Minimum incinerator capacity shall be based on the maximum daily weight of animal mortality during a typical growing cycle that is to be incinerated in accordance with the mortality disposal plan. The maximum daily weight of animal carcasses shall be based on mortality data over several growing cycles excluding catastrophic losses. In the absence of specific landowner mortality data, incinerator capacity shall be based on similar operations in the local area.

The incinerator shall not be charged at a rate that exceeds it’s design capacity.

**Location.** The incinerator shall be located a sufficient distance, as recommended by the manufacturer, from any structure to prevent spontaneous combustion or 20 feet whichever is greater.

To provide for structural stability and safety, the incinerator shall be placed on a firm, level foundation consisting of a reinforced (fiber or steel) concrete pad. The pad shall be at least 4 inches thick. The concrete slab shall extend sufficient distance on all sides of the incinerator base to accommodate management of the facility. The top of the concrete slab shall be a minimum of 0.5 foot above natural ground.

The placement of the fuel tank with respect to the incinerator shall comply with all safety regulations.

If the incinerator is covered with a roof, it shall be made of metal and at least six inches clearance are required between the incinerator chimney and any combustible roof parts. The size and other clearances shall be as recommended by the incinerator manufacturer.

The incinerator must be located on a farm and is owned and operated by the farm owner or by the farm operator. The incinerator is used solely to dispose of animals or poultry originating on the farm where the incinerator is located. Incinerators shall only be used for the cremation of dead animals.

The site shall be graded to drain or divert all overland runoff safely away from the structure and surrounding work area.

**Installation.** Electrical components and installation shall meet the requirements of the National Electrical Code (NEC) and state and local codes for outdoor installation. All electrical wiring shall be in a conduit.

Installation shall be certified in writing by a qualified licensed electrician or a licensed electrical inspector.

Gas hook-up must be certified in writing by a qualified licensed Liquified Petroleum contractor to meet applicable National Fire Protection Association (NFPA) codes, all other national, state and local codes, and in conformance with the manufacturer's recommendations.

Fuel storage for diesel powered units shall be installed in accordance with manufacturer's recommendation and shall meet all applicable state and local codes, rules, and regulations.

**Criteria Applicable to All Purposes – Catastrophic Mortality**

**General.** 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. Animal burial during a declared emergency shall follow the guidelines of the State Animal Response Team, as published by the NC Department of Agriculture and Consumer Services, Veterinary Division.

**Location.** The facility shall be located as far away from neighboring dwellings and the poultry or 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 on-site or as otherwise directed by state 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.

**Location.** The burial site must be at least 300' from any existing stream, public body of water or public water supply well. It shall be at least 100' from any well. The burial site cannot include any portion of a waste lagoon or lagoon wall. If the burial site is located in a sprayfield, the burial site will not be available for subsequent spraying until a new, viable crop is established on the site. The burial site shall not be located in the tiled area of an underdrained field.

**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 state and local regulatory agencies. The burial pit shall be a minimum of 4 feet wide with length necessary to accommodate mortality. Depth shall accommodate a minimum of 3 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 three 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.

For pits that are four to five feet deep, a step or bench 18 inches wide and one foot deep will be dug around the perimeter of the main pit so the remaining vertical wall will not exceed four 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.

**Composting**

**General.** Catastrophic mortality composting shall be in either passive piles or windrows as

described in National Engineering Handbook Part 637, Chapter 2 – Composting (NEH 637.0210 and NEH 637.0211).

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 will 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. The facility shall be located as far from neighboring residences as practical and shall be located no closer to the neighboring residence than the animal houses. A minimum of 300 feet should separate the facility from the nearest neighboring residence. The facility should be no closer than 100 feet to a well, spring, or water course.

Runoff from the livestock or poultry facility, or from outside areas should be diverted away from the animal mortality disposal facility.

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 time frame 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, and to minimize visual impact.

State requirements for record keeping vary. Items such as burial site location, type and quantity of mortality, burial date, and other pertinent details should be noted at the time of burial.

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 operation and maintenance 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 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 considerations shall be prominently displayed in the plan.

### *Normal Mortality*

Animal mortality facilities will normally be operated or used on a daily basis. At each operation or use, the facility shall be 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 operation and maintenance plan shall identify the most likely compost medium, possible compost recipes, operational information, and equipment that will need to be readily available.

### *Freezers*

Freezer temperature should be monitored regularly to ensure proper operation of freezing carcasses.

Freezers should be inspected periodically to ensure that all components are operating as planned and in accordance with manufacturer's recommendations. To ensure the leak-proof integrity on the units, freezer containers must be inspected after each transfer of the carcasses to trucks for transport off-site.

The O&M Plan shall include, but not be limited to the following:

- Approved method of mortality disposal
- The name and telephone number of the mortality collection service or the rendering plant / recycling plant responsible for handling animal carcasses, if applicable
- Capacity of the freezer and schedule for removing carcasses from the freezer(s)
- Freezer operating temperature
- Method of disposal for catastropic losses
- Contact(s) and phone numbers of person(s) to contact in case of catastropic losses
- Biosecurity measures

### *Incinerators*

Incinerators must be operated properly to maximize equipment life and minimize emission problems. Any operator of an incinerator shall be trained by the manufacturer's representative or an equivalent organization. A trained operator must be on-site when the incinerator is in operation.

The incinerator must be loaded according to manufacturer's recommendations.

The incinerator should be inspected periodically to ensure that all components are operating as planned and in accordance with the manufacturer's recommendations.

Ashes should be removed frequently to maximize combustion and prevent damage to equipment. The O&M plan shall include methods for collecting and disposing of the ash material remaining after incineration. The plan shall include a dedicated metal ash collection box or container. The ash shall be land applied at agronomic rates.

## 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)

National Engineering Handbook, Part 637, Chapter 2, Composting

NRCS GM 420 Part 401 – Cultural Resources

NRCS National Handbook of Conservation Practices

North Carolina State Statutes 106-403, 106-549.70 and 143-215.10C

North Carolina Administrative Code Title 02 Ag and Consumer Services, Subchapter 52C, Section .0100