

NATURAL RESOURCES CONSERVATION SERVICE  
VIRGINIA  
OPERATION AND MAINTENANCE PLAN  
ANIMAL MORTALITY FACILITY – LARGE ANIMAL BINS  
CODE 316

Land Owner/Operator \_\_\_\_\_

County \_\_\_\_\_ SWCD \_\_\_\_\_ Farm/Tract No. \_\_\_\_\_

Prepared By \_\_\_\_\_ Date \_\_\_\_\_

**OPERATION AND MAINTENANCE ITEMS**

A properly operated and maintained animal mortality facility is an asset to your farm. The estimated life span of this installation is at least 15 years. The life of this installation can be assured and usually increased by developing and carrying out a systematic operation and maintenance program.

**GENERAL**

Daily operation of the animal mortality facility is described in the first section of this plan. The second section is the Mortality Management Plan that describes the landowner's plan for daily mortality management and disease or non-disease catastrophic mortality. The Mortality Management Plan is the responsibility of the landowner. Contact the NRCS office if assistance is needed with site selection. As a minimum, the plan will include the proposed method of mortality disposal, selected site, materials needed, etc. A primary plan and a backup plan for catastrophic mortality are recommended. Example: Plan 1 is to compost in windrows. Plan 2 is to landfill the mortality if composting material is not available.

- Attach records of date, average weight, and number of deaths. In the case of catastrophic mortality, also include the number of animals and cause of death.
- References and/or manufacturer or installer information for trouble shooting:

\_\_\_\_\_  
\_\_\_\_\_

- Contact information for state authorities in the event of a mass culling or a catastrophic event. There may be specific requirements for mortality disposal depending on cause of death, livestock species and housing.

State Veterinarian: **804-692-0601** during business hours.

Virginia Department of Emergency Management: **804-674-2400** (State Vet after hours)

Other: \_\_\_\_\_

## **SAFETY AND BIOSECURITY**

Dead poultry and livestock will be disposed of according to state or local laws and in a way that does not adversely affect ground or surface water or create public health concerns.

### **Composting (for routine mortality and catastrophic events)**

- All dead animals will be placed in the composting area within 48 hours of carcass discovery.
- Animal carcass composting shall only be on the property which is used for the raising and husbandry of animals unless a permit is obtained.

### **Burial (for catastrophic events only)**

- The animal carcasses shall be buried within 48 hours of death and prior to creation of an open dump, hazard, or nuisance situation. Burial of routine livestock or poultry mortality is not allowed under this conservation practice.
- Animal carcass burial shall only be on the property which is used for the raising and husbandry of animals unless a permit is obtained.

## **COMPOSTING**

*On-farm composting of routine livestock, poultry, and aquaculture mortality is regulated by Virginia DEQ Waste Guidance Memo No. 02-2009, On-site Composting of Routine Animal Mortality.*

- Composting is a biological process that needs monitoring and management throughout the composting period to ensure proper composting processes. The operation may need to undergo some trial and error in the start-up of a new composting facility. Manage the compost piles for temperature, odors, moisture, and oxygen, as appropriate.
- The composter shall be loaded according to the recipe listed below. Careful attention must be paid to the recipe in order for the composter to work properly. Contact NRCS to assist with troubleshooting during the composting process.
- Failure to manage the system will result in an odorous operation that may attract flies, buzzards, and other vermin. Mosquitoes may reproduce where standing water is present. To minimize vector problems:
  - Adhere to the composting recipe.
  - Eliminate standing water.
  - Employ good housekeeping to keep the area clean.
- The compost shall be land applied at the rates outlined in the Nutrient Management Plan and in accordance with state law. At least 75% of any material accumulated and/or composted must be used within one year of accumulation or it may become subject to regulation as a solid waste. Screening may be used to remove large bones from the finished compost. The screened bones can be re-composted or placed in a landfill.

- This composter was designed to handle normal mortality rates from this operation. The facility is not designed for catastrophic losses resulting from excessive heat, collapse of buildings, loss from disease, etc. Such losses shall be disposed of as described in the catastrophic mortality management plan.
  - Include the method, procedure, and record keeping requirements for proper utilization of compost. Records must be kept for three years.
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**Carbon-Nitrogen Ratio.** The initial compost mix shall result in a carbon to nitrogen (C:N) ratio between 25:1 and 40:1. Compost with a lesser carbon to nitrogen ratio can be used if nitrogen mobilization is not a concern.

The initial C:N ratio will be \_\_\_\_\_

**Carbon Source.** Store a dependable source of carbonaceous material with a high C:N ratio to mix with nitrogen-rich waste materials.

The carbonaceous material will be \_\_\_\_\_ and it will come from \_\_\_\_\_

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It will be stored \_\_\_\_\_

**Bulking Materials.** Add bulking materials to the mix as necessary to enhance aeration. The bulking material may be the carbonaceous material used in the mix or a non-biodegradable material that is salvaged at the end of the compost period. Make provision for the salvage of any non-biodegradable material used in the composting process.

\_\_\_ Carbonaceous material will be used as the bulking material.

\_\_\_ A non-biodegradable material will be used as the bulking material. At the end of the composting process, it will be salvaged by \_\_\_\_\_

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**Moisture Level.** Maintain the moisture content at 40 to 60 percent during the composting process (40% - does not leave your hand moist when squeezed, 60% will allow about one drop of water to be released when squeezed, > 60% - if more than two drops drip from your hand the material is too moist, therefore add sawdust or dry carbon source). Prevent excess moisture from accumulating in the compost in high precipitation climatic regions. The compost pile must be shaped to shed water.

**Temperature of Compost Mix.** Manage the compost to attain and then maintain the internal temperature for the duration required to meet management goals. Temperatures over 160°F are detrimental to the compost bacteria population. Turn the pile and reduce pile depth to cool the pile.

Closely monitor temperatures above 165°F. Take action immediately to cool piles that have reached temperatures above 185°F. If temperature rises above 185° F, the material should be

removed from the facility and cooled by spreading on the ground in an area away from buildings to a depth not to exceed six inches. Water should be added only if flames occur. After cooling, reload the compost facility.

A poultry or small animal bin-type facility used to compost animal carcasses shall have the capacity to maintain the compost temperature greater than 130° F for at least 5 days as an average throughout the compost mass followed by a comparable time for secondary composting. Temperatures must exceed 130° F for three consecutive days during this time period.

For a windrow, static pile, or large animal bin-type facility, the temperature of the compost shall be above 130° F for 15 days. Temperatures must exceed 130° F for three consecutive days during this time period.

Temperature is the primary indicator to determine if the composting process is working properly. If the minimum temperature is not reached, turn the compost and add water as needed. Compost managed at the required temperatures will favor destruction of any pathogens and weed seeds.

**Composting Time.** Typical composting times are listed in the table below. The use of different materials for the carbon source will affect the time. For example, using moist manure, litter, or spoiled silage will cause the compost to heat more quickly than using sawdust.

#### Typical composting times.

Mortality size (lbs.)	4	10	50	100	220	350	500	1000	1500
Primary stage (days)	10	16	35	50	75	95	115	160	195
Secondary stage (days)	10	10	12	15	25	30	40	55	65
Storage stage (days)	30	30	30	30	30	30	30	30	30

**Turning/Aeration.** Turn the compost pile when the temperature begins to drop. Check the moisture in the compost mix prior to turning so that water can be added during the turning process, as needed.

**Monitoring:** Test the finished compost as appropriate to assure that the required decomposition has been reached.

**Troubleshooting:** Good carcass compost should heat up to the 140° range within a few days. If temperature falls significantly during the composting period and odors develop, or if material does not reach operating temperature, investigate piles for moisture content, porosity, and thoroughness of mixing.

**Compost Mix.** Develop a compost mix that encourages aerobic microbial decomposition and avoids nuisance odors. See NEH Part 637, Chapter 2, for examples of compost recipe determinations. The initial compost mix will be similar to the recipe shown below.

## Suggested Recipe for Swine in bins (with sawdust or with a sawdust/straw/litter combination)

	With sawdust only	With broiler litter and sawdust/straw
Ingredient	Parts by Weight	Parts by Weight
Bulking agent (sawdust or sawdust/straw)	1.5	1.0/0.3
Carcasses	1.0	1.0
Water	As needed	0.7
Litter	-	2.0

**COMPOSTER OPERATION - Large Animals Bins**

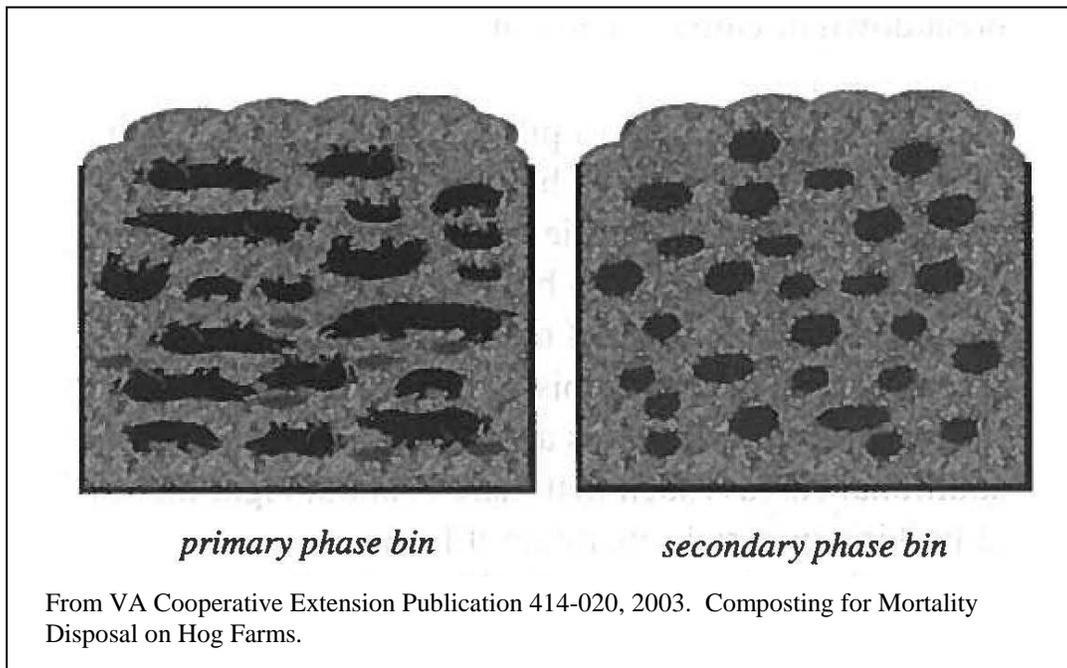
1. Put at least 12” of absorbent, high-carbon bulking material down as a base layer.
2. Add mortalities as they occur and promptly cover them with bulking material.
3. Assess the moisture conditions each time carcasses are added. If moisture levels are too low, add water as the carcasses are placed.
4. Place each additional carcass such that there is about eight inches of bulking material separating it from other carcasses or from the compost bin wall. Do not pile carcasses directly in contact with other carcasses or with the compost bin wall. (Figure 1.)
5. Once a primary pile has been built up to within a foot of the top of the bin wall, top it off with a one-foot deep protective layer.
6. Monitor the temperature daily. The pile will begin to cool when the process is near completion. If the pile cools much earlier than the time indicated in the chart above, there may be a problem with the process.
7. When the pile is turned into the secondary bin, ensure that there is bulking material between the remaining carcass material and the bin walls. (Figure 1.)
8. After the secondary composting is complete, the compost should be stored for 30 days to allow stabilization. This can be done in the secondary bin or in another location. Protect the compost from the weather and from being re-contaminated with weed seeds.

**COMPOSTER MAINTENANCE**

- Inspect the composting facility at least twice each year when the facility is empty. Replace any wooden parts or hardware as needed. Roofed structures should be examined for structural integrity.
- Maintain all electrical and mechanical equipment by following the manufacturer’s recommendations. Maintain grounding rods and wiring for all electrical equipment.

- Maintain all fences, railings, and/or warning signs used to provide warning and/or prevent unauthorized human or livestock entry.
- Check backfill areas around structure for excessive settlement. Make necessary repairs.
- Check walls and floor often for cracks and/or separations. Make any necessary repairs.
- To prevent erosion, a good vegetative cover should be established and maintained around facilities. Clip twice a year to ensure a vigorous stand. Control noxious weeds. Traffic accesses shall be maintained and/or replaced as necessary.
- Do not let dead poultry compost come into contact with litter stored in a litter storage shed due to the potential for spontaneous combustion.
- Do not compact the compost material by driving over it or packing it with equipment. Do not allow the operation of any equipment that exceeds the design limit on or within ten feet of the structure.
- Immediately repair any vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.
- Maintain positive drainage around the structure.

Figure 1. Arrangement of carcasses in primary and secondary bins.





**MORTALITY MANAGEMENT PLAN**

**DAILY MORTALITY.** Daily mortality will be managed by:

\_\_\_\_\_ (method)

Anticipated daily mortality is \_\_\_\_ birds/animals at an average weight of \_\_\_\_ lbs.

Soils, Geology, Water Table, and Other Site Conditions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Permit Required (Y/N): \_\_\_\_\_

Closure Plan:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**NON-DISEASE CATASTROPHIC MORTALITY.**

**First Plan of Action.** Non-disease catastrophic mortality will be done by

\_\_\_\_\_ (method)

at \_\_\_\_\_ (location).

Contract Needed (Y/N)? With \_\_\_\_\_

Permits Required (Y/N)? \_\_\_\_\_

Soils, Geology, Water Table, and Other Site Conditions:

\_\_\_\_\_  
\_\_\_\_\_  
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Materials Needed (Type and quantity):

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Source of Materials:

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Equipment Needed:

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Backup Plan for obtaining materials:

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**Second Plan of Action (Backup plan):** Non-disease catastrophic mortality will be done by \_\_\_\_\_ (method)  
at \_\_\_\_\_ (location).

Contract Needed (Y/N)? With \_\_\_\_\_

Permits Required (Y/N)? \_\_\_\_\_

Soils, Geology, Water Table, and Other Site Conditions:

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Materials Needed (Type and quantity):

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Source of Materials:

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Equipment Needed:

Backup Plan for obtaining materials:

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**Closure Plan (for Plan 1 and/or Plan 2, as needed):**

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**DISEASE CATASTROPHIC MORTALITY**

**First Plan of Action.** *Disposal of catastrophic mortality caused by disease will be done as directed by the State Veterinarian.* The most likely scenario is \_\_\_\_\_  
\_\_\_\_\_ (method)  
at \_\_\_\_\_ (location).

Contract Needed (Y/N)? With \_\_\_\_\_

Permits Required (Y/N)? \_\_\_\_\_

Soils, Geology, Water Table, and Other Site Conditions:

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Materials Needed (Type and quantity):

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Source of Materials:

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Equipment Needed:

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Backup Plan for obtaining materials:

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**Second Plan of Action (Backup plan):** *Disposal of catastrophic mortality caused by disease will be done as directed by the State Veterinarian.* The second most likely scenario is \_\_\_\_\_ (method) at \_\_\_\_\_ (location).

Contract Needed (Y/N)? With \_\_\_\_\_

Permits Required (Y/N)? \_\_\_\_\_

Soils, Geology, Water Table, and Other Site Conditions:

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Materials Needed (Type and quantity):

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Source of Materials:

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Equipment Needed:

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Backup Plan for obtaining materials:

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**Closure Plan (for Plan 1 and/or Plan 2, as needed):**

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Site Map for Catastrophic Mortality Disposal:

See Virginia Engineering Design Note 2 – Separation Distances for Animal Waste Facilities for information on required separation distances.

