

Composting Facility Operations Plan (CFOP)

Executive Summary

The Tennessee Wildlife Resource Agency (TWRA) proposed to compost deer carcasses at a facility located in Hardeman County on Big Springs Road (latitude 35.3961 / longitude -88.8556), in the Chickasaw State Forest (hereafter 'Chickasaw'). The majority of the feedstock will come in the form of deer carcass parts that are left over from deer processors in the region. Should any of the facilities compost practices change this plan will be modified to reflect the change(s).

Facility Overview

The following operational procedures (methods and practices) comply with the intent of regulations to protect human health and the environment will not creating nuisances.

I. Waste Handling and Processing Equipment

a. Equipment

- i. A front-end loader with bucket attachment.
- ii. Dump-trailers
- iii. Compost thermometers

b. Operation

- i. A front-end loader will be utilized for on-site operation of the composting site. This equipment will be used to move carbon material on-site, building and maintaining windrows, and processing waste materials.
- ii. Carbon material and waste material will be delivered to the site using dump-trailers.
- iii. Compost thermometers will be utilized to monitor windrow temperature.

c. Maintenance

Refer to the "Daily Operations Checklist" for equipment maintenance.

d. Repair and Replacement

Waste handling and processing equipment will be repaired and replaced as needed. In the event of equipment failure, loaner or rental equipment will be utilized to properly manage waste.

II. Personnel

- a. The facility will maintain sufficient personnel to process the feedstocks and compost as described

III. Feedstock

- a. Types of feedstock accepted will include deer carcass parts from deer processors and TWRA's sampling effort.

- b. Receiving**

Waste acceptance guidelines are included in the "Daily Operations Checklist."

This facility is being constructed with the intention of receiving deer carcass parts left over from deer processors and TWRA's deer management sampling efforts. All deer processors that use the composting facility will be asked to screen each load prior to being shipped to the facility to ensure there are no non-compostable or unauthorized waste materials delivered to the site.

In addition, upon arrival to the facility, all loads will be inspected prior to unloading to prevent the acceptance of non-compostable and unauthorized materials. Loads containing unauthorized materials will be rejected.

- c. Non-compostable Waste Removal**

Non-compostable waste materials will be removed and disposed of at an authorized facility.

- d. Materials Storage**

No waste materials will be stored at the facility. The carbon source material(s) will be stored on site. Refer to the facility Master Plan for the storage area locations.

IV. Processing

- a. Feedstocks**

Any loads that have more than de minimis amounts of free liquid (e.g., blood) will be mixed with a bulking material (e.g., saw dust) prior to placement in a windrow.

The majority of the feedstock will have already been processed by a deer processor prior to arrival at the facility. As such, no additional processing will be needed.

At the end of each operating day, all incoming feedstocks are processed into the active composting pile or mixed with bulking material and covered in a manner that minimizes nuisance odors and scavenging by vectors.

- b. Windrows**

Windrows are created by laying the deer carcass material onto the composting pad in a long straight row. The loader is used to shape the material into a rough windrow shape. The operation will consist of up to 3 windrows with an estimated max length of 100 feet each. Each windrow will be approximately 12 feet wide by 7 feet tall with approximately 15 feet between each windrow for operating.

The compost material will be maintained at a minimum average temperature of 55° C or higher for 15 days or longer. Temperature probs will be deployed to monitor the temperature. Windrows will not be turned unless the Department determines it to be necessary.

c. Measures to Control Nuisance Odors

The feedstock and carbon source will be mixed in appropriate proportions to achieve a 25-30:1 Carbon to Nitrogen ratio. The windrows will be topped with approximately 10-12 inches of a cap material (e.g., woodchips, saw dust) to control nuisance odors. In the event that odors are detected or become problematic, more cap material will be added.

d. Measures to Control Vectors

The composting operation is completely fenced in to prevent vectors from accessing the windrows in addition to the windows being designed to reduce odors that would attract vectors. The windrows will be topped with approximately 10-12 inches of cap material (e.g., woodchips, saw dust) to control nuisance odors and vectors. Additional measures will be taken as necessary based on any vector appearance.

e. Measures to Control Fires

Open burning is not permitted at the facility. Fire extinguishers are located on site. Tennessee Division of Forestry also has firefighting equipment on site and has agreed to assist as needed.

f. Measures to Control Contact Water and Stormwater

The facility is graded to minimize the flow of contact water and stormwater as well as to direct it to the surrounding vegetated/forested areas.

g. Composting Pad Maintenance

The compost pad is a compacted natural surface pad with sufficient slope to maintain positive drainage. Periodically the pad is leveled to fill in holes or low areas that may have developed during normal composting operations. Additional clay soil or crusher run will be used when necessary to fill larger holes or soft spots that develop on the pad without compromising the geologic buffer integrity. The composting pad will be constructed to prevent stormwater from flowing on to it.

V. Testing

a. Compost Temperature and Moisture Monitoring Plan

Compost thermometers are used to monitor the temperature of the compost windrows. The readings are recorded on a compost windrow monitoring form. These forms are used to monitor the breakdown of the compost. When a row has gone through the

thermophilic composting phase and the temperature is consistently below 55° C and does not reheat above 55° C, it is considered to be in the curing phase.

The squeeze method is used to determine proper moisture level in the windrows. The compost should be moist enough to form a ball when squeezed in your hand, but should break apart easily when tossed into the air and caught again. Moisture should not freely run from the compost when squeezed.

b. Samples

The resulting compost material will not be used as a product, so samples and measurements will not be taken unless requested by TDEC or the end use of the material changes. The resulting material is to be incinerated in a TWRA owned and permitted incinerator.

c. Stability

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d. Pathogens

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e. Metals

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f. Sedimentation and Retention Pond Water Analysis

Due to the small size of the site and the nature of the compost material, no retention pond will be used. Thus, it is not anticipated that contact water will need to be analyzed. The site will be surrounded with a silt fence to control and manage sediment. Due to the nature of the compost material it is not anticipated that any sediment analysis will be needed.

VI. Record Keeping

- a. The following information will be recorded:
 - i. The type and quantity of feedstock and the source of feedstock received;
 - ii. The quantity of compost produced;
 - iii. The quantity of composted removed for disposal. The operator will also identify the permitted facility that the compost is sent to.
- b. Records regard the activities for each month of operation of the facility are maintained at the facility for three years.

VII. Compost Facility Operations Plan Review

The CFOP will be updated if there is a change to procedures (including equipment) or the types of feedstocks processed and reflect how the facility will continue to comply with the intent of the rules. In addition, the CFOP will be internally reviewed annually to ensure it continues to reflect current procedures, equipment and feedstock(s).

The CFOP will be made available to the permitting authority upon request.

Closure/Post-Closure Plan

Closure of the facility should be as follows:

1. The facility will cease receiving new feedstock
2. The facility will process remaining feedstock located on-site for composting
3. Excess feedstock and compost will be incinerated in one of the permitted TWRA incinerators
4. The facility will continue to operate and process the composting windrows through the thermophilic stage as specific in the Compost Facility Operations Plan
5. The facility will remove all non-compostable waste as specified in the Compost Facility Operations Plan.
6. Finished compost will be disposed of via incineration. Finished compost will be transported to one of the TWRA owned and permitted incinerators. If disposal at a landfill becomes an option, TWRA will consider sending the finished compost and other waste materials to said permitted landfill.
7. The silt fence will remain in place until the site is seeded and vegetative growth is seen over a significant portion of the site.
8. All bare areas within the facility will be stabilized to prevent erosion. The site will be seeded to promote vegetative growth.

Post-closure care of the facility will not be required after all feedstocks, compost and stabilization has been completed according to the closure plan. When closed according to the plan the facility will not post a risk to public health or the environment.

Daily Operations Checklist

Tractor Maintenance

- Check Engine Oil
- Check Hydraulic Fluid
- Check for Fluid Leaks
- Check Front Tire Pressure
- Lubricate Grease Fittings on Loader

Waste Tipping Pad Preparation

- Add Wood Chips/Mulch/Saw Dust to Pad
- Close Open End of Pad with Wood Chips/Mulch/Saw Dust to Prevent Liquid Spillage
- Check Tipping Pad Walls and Floor for Cracks or Other Signs that Water Could be Leaking

Processing Load of Waste Produce

- Complete Checklist for Equipment Maintenance
- Mix Tipped Material with Wood Chips/Mulch/Sawdust in Tipping Area
- Cover Windrow with Wood Chips/Mulch/Sawdust as Needed
- Weigh Down Windrow Cover to Prevent Wind Removal
- Use Compost Monitoring Form to Create Record of New Row as Needed

General Site Maintenance

- Visually Inspect Windrows for Leachate and Add Woodchips/Mulch/Sawdust if Necessary
- Visually Inspect Windrow Covers and Weigh Down if Necessary
- Visually Inspect Site for Proper Drainage
- Take Temperature Readings of Windrows and Record on Compost Monitoring Forms
- Visually Inspect Site for Unsecured Trash and Remove as Necessary