

# Short-Term Storage of Animal Waste and By-Products



Oklahoma Conservation Practice Job Sheet

JS 318 01

Landowner \_\_\_\_\_



## SHORT-TERM STORAGE OF ANIMAL WASTE AND BY-PRODUCTS

Short-term storage of animal waste and byproducts consists of temporary, non-structural measures used to store solid or semi-solid, organic agricultural waste or manure on a short-term basis between collection and utilization.

### PRACTICE INFORMATION

The purpose of short-term storage is to temporarily stockpile or store animal waste such as organic byproducts, stackable livestock and poultry manure, bedding, litter, spilled feed, or soil mixed with manure in an environmentally safe manner. Short-term storage provides improved nutrient utilization and conservation through greater flexibility in nutrient application timing and protects surface and groundwater resources as well as reduces energy use.

Site conditions, climate, and State or local laws may require short-term storage stockpiles to be covered. Covers may include plastic sheeting, geotextile, or geotextile bags.

Short-term storage planning should incorporate environmental concerns, economics, the overall

waste management system plan, and safety and health factors.

The design of short-term storage depends on the intended storage period; the site location and foundation soils; Federal, State, and local laws and regulations; waste volume; stockpile covering; biosecurity and safety concerns.

A Comprehensive Nutrient Management Plan (CNMP) or Nutrient Management Plan (NMP) is developed to specify requirements for utilizing the stored manure. The plan specifies timing, rates, and volume of waste applications. An emergency action plan will be developed where there is a potential for an accidental manure spill event.

### WHEN IS TEMPORARY STORAGE NECESSARY?

Waste management is an important part of all animal feeding operations. Collection and removal of waste from the production areas depends upon several factors including herd or flock scheduling, equipment availability and schedules. Ideally, waste should be spread at a proper rate as it is removed from the production buildings. However, cleanout activities do not

always coincide with the availability of open cropland or proper climatic and soil conditions.

There will be times when producers must temporarily store or stockpile the waste between cleanout operations and land spreading or export off the farm. Properly planned, stockpiling can be an alternative which allows more flexibility in waste management. Improper management, however, not only results in loss of an economic resource due to reduced fertilizer value but presents the potential to reduce water quality when the leachate or solids from the pile are carried to surface or ground waters by wind or rainfall runoff. Runoff and leaching from stockpiles and fields where waste has been over-applied can become an acute problem in the denser confined livestock and poultry producing areas of the state.

The primary purpose of a properly planned and designed storage area is to provide a place to temporarily store the waste until it can be spread on land operated by the producer or exported off site. State regulations require that all waste be stored until it is spread, under dry conditions where runoff will not occur. Waste storage areas should be located on well-drained sites that will allow all-weather access for loading and unloading.

### **TEMPORARY STACKS V. LONG TERM STORAGE**

Any livestock waste stored in excess of six months should be contained in a waste storage structure. Waste storage structures are expensive to construct and the cost versus other alternatives should be considered.

Temporary manure or litter stacks should be considered when the storage period is going to be less than six months. Temporary waste storage requires a water proof, flexible cover to prevent runoff and keep the waste product dry.

### **LOCATION OF STORAGE**

Proper waste storage consists of providing areas which are prepared and maintained in a manner which prevents leachate or percolation through the pile and into the groundwater. In

addition to protection of the groundwater, measures shall also be used which prevent runoff from or through the pile.

Locate temporary waste stockpiles on high, well-drained ground so runoff can be controlled and directed to grass filter area. The pile should be built in a long, narrow shape to make handling easier.

Waste should not be stored on high water table soils or on shallow soils over rock outcropping without a liner to prevent nitrogen leaching and bacterial contamination of the groundwater.

The site should be graded to provide good under-drainage and to prevent frost heaving during cold weather. An improved gravel roadway will allow the stockpile to be used during bad weather. Cover the stockpile with plastic or an anchored bunker silo cover. Sharp anchors such as concrete blocks may damage the cover and should be used with care.

The following guidelines should be followed in selecting the location of the temporary storage pile:

- At least one foot above the 100-year floodplain elevation unless site restrictions require a location within the floodplain. If within the floodplain, protect the facility from inundation or damage from a 100 -year flood event
- As far away as practical and at least 300 feet from neighboring residences or public roads or areas
- At least 150 feet down gradient from domestic wells, springs, streams, and ponds
- At least 300 feet up gradient from domestic wells, springs, streams, and ponds
- Do not locate the pile within 400 feet of a public water supply well or surface waters
- At least 300 feet from all drainage ways

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- Do not locate the pile farther than 150 feet from the top of a slope unless overhead water is diverted away from the pile.
- Where the seasonal high water table will be no closer than 3 feet below the bottom of the stored manure, unless a geosynthetic liner is used
- On soils with a maximum saturated hydraulic conductivity class (kSAT) of moderately high (~ 2 in/hr) or on a soil pad, geomembrane lined pad, or similar lining method and the stockpile is covered
- Where there will be positive drainage from the stack in all directions and clean water runoff is excluded from the stockpile storage area
- Where access is not limited by poor weather conditions such as excessive ice, snow, or muddy ground
- Locate the pile as close as possible to natural windbreaks or other areas that protect the covering from blowing winds

#### FOUNDATION BENEATH THE PILE

Perform the stacking operations on a firm, uniform surface. Acceptable foundations for storage piles consist of at least one of the following when a high water table or on shallow soils over rock is **NOT** present:

- On soils with a maximum saturated hydraulic conductivity class (kSAT) of moderately high (~ 2 in/hr)
- New synthetic liners at least 20 mil thickness, completely free of all tears or punctures. This liner shall be placed in an over-excavated area 6 inches deep and covered with compacted soil. Compacted soil shall be free of any material that could puncture the liner.
- One foot of compacted clay liner, constructed in two six inch lifts at optimum moisture content. Lifts must be

free of trees, rocks, roots, etc. greater than 4 inches in diameter.

When the temporary storage is located on soils with a high water table or shallow soils over rock only synthetic liners are acceptable.

#### COVERING

If the waste is to be temporarily stockpiled, it should be covered with acceptable materials including geotextiles (tarps) that shed rainfall and allow transpiration, opaque plastic or polyethylene sheeting having a minimum thickness of 6 mils, or other water resistant material. If this practice will be used often, a reinforced, ultraviolet-resistant cover will last longer and may be a good investment.

Ensure that the cover is placed over the pile with care to prevent tearing. Provide a minimum of 24 inches of overlap. Use weights, anchors or other tie down mechanisms to anchor the cover and prevent tearing during high winds. A trench 12 inches deep constructed around the waste pile with the edges of the cover buried in the trench is the preferred method of anchoring. When screw type anchors are used, place the anchors on 2-foot centers around the pad.

#### SIZE OF PILE

Pile heights should be kept as small as possible. To reduce the potential for spontaneous combustion, the maximum height when stacking the manure will be no greater than 7 feet. High temperatures can be generated in piled manure, especially poultry litter, and under favorable conditions, spontaneous combustion can occur. If possible, piles should be kept in the five feet high range to avoid the possibility of fire. Allow a minimum of 4 feet around the edges of the stack to properly anchor the covering and facilitate the removal of the manure.

#### OPERATION AND MAINTENANCE

Refer to the CNMP or NMP for utilization guidelines including location, timing, application rate and quantity to be land applied.

If the temporary stockpile area will be reused the soil pad may require reconstructing if soil is

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inadvertently removed during the waste removal process.

Where a geomembrane liner is used, care must be taken during removal of the stored material to not damage the geomembrane liner. Insure that any needed repairs of the geomembrane are completed promptly.

Develop an emergency action plan where there is a potential for an accidental manure spill event. Include site-specific provisions for emergency actions that will minimize these impacts.

Plastic or polyethylene coverings will deteriorate over time and need to be replaced. Disposal of damaged liners or covers will be in conformance with local laws and regulations. When the cover or liner is a recyclable material, it is recommended that it be disposed of at a

recycling center. If a recycling center is not available disposal should be in a landfill or other suitable disposal method.

The pile should be inspected after every major storm event and needed repairs completely promptly.

Maintain the area surrounding the field stockpile area in such a manner to prevent ponding of water and to ensure runoff is diverted from the stockpile area.

Practice recommended fly and rodent control measures around the production areas and in the vicinity of the waste stockpile.

Remove the waste stockpile as soon as possible and immediately renovate the site and seed to grass. Permanent vegetation should be established on all disturbed areas.

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