

BEST MANAGEMENT PRACTICES
FOR CONCENTRATED ANIMAL FEEDING OPERATIONS
February 16, 2001

SECTION A – APPLICABILITY

1. These best management practices (BMP) pertain to general permits issued to concentrated animal feeding operations (CAFO) that collect processes wastes for reuse as organic fertilizers and soil conditioners.
2. These BMPs are based on design regulations under 10 CSR 20-8.020; guidelines under Manual 121, Design Guidelines For Animal Waste Management, July 1989, Missouri Department of Natural Resources; Manual 115, The Missouri Approach to Animal Waste Management, 1979, University of Missouri Extension Services; and Natural Resource Conservation Service standards. Exceptions to BMPs may be approved on a case-by-case basis by the department.

SECTION B – DEFINITIONS

Definitions as set forth in the Missouri Clean Water Law and 10 CSR 20-6.300 shall apply to those terms used herein. Other applicable definitions are as follows:

1. Agricultural rates means not exceeding the agronomic rates or fertilizers needs of the plants to be grown.
2. Biosolids are the solids or semi-solids (non-liquid) portion of animal wastes. This includes manure solids that are separated by physical means, or mixtures of manure and bedding materials (straw, wood chips, rice hulls, etc.) that absorb the liquids. Biosolids are considered process wastes.
3. Design Storm means the 25-year, 24-hour storm; the 10-year, 10-day storm, the 10-year, 365-day rainfall; and the 10-year, 365-day rainfall minus evaporation.
4. Grassed Buffer Area means a grassed area that receives contaminated storm water runoff and provides filtering of solids and some infiltration of applied storm water so that runoff from the buffer area is as sheet flow and is considered a non-point resource.
5. Land Application means the spreading or irrigating of process wastes onto agricultural land or forestland.
6. Land Application Management Approach means the conservative or plant available design approach for determining nitrogen application rates as follows:
 - (a). Conservative Management Approach means the annual application rate is based on applying 100 pounds per acre of total nitrogen. Total nitrogen is based on total nitrogen content of the wastes at the time of application.
 - (b). Plant available Nitrogen Approach means the annual application rate is based on the available nitrogen uptake of the plants to be grown using annual testing of process wastes and soils to determine nitrogen requirements.
7. Safety Volume means the portion of the storage basin that is reserved for containment of the 25-year, 24-hour or the 10-year, 10-day storm events.
8. Storage structure means all outside storage structures containing liquid wastes such as lagoons, earthen manure basins, concrete manure pits, storage tanks, and other such storage structures.
9. Vegetative Filter means a grassy area that is designed and operated so as to receive and infiltrate storm water runoff from livestock feeding areas. Storm water is applied to the vegetative filter within a few hours or days after each storm event.

SECTION C – GENERAL REQUIREMENTS

1. No-Discharge Requirements

- (a). Process wastes shall be removed from the operation on a routine schedule based on the design capacity of the storage structure(s) and shall be land applied at agricultural rates.

2. Beneficial Use Requirements

- (a). This operation is required to recycle or reuse process wastes and biosolids as organic fertilizer onto agricultural land or forestland.

3. Operating Plan

Follow the operating plans contained in the permit application.

4. Dead Animal Disposal

- (a). Dead animal disposal shall be conducted in compliance with the dead animal disposal regulations of the Missouri Department of Agriculture.

5. Storage Structures

- (a). The approval storage structures are listed in the Detailed Operation Description and in the permit application. No other outside storage of the process wastes is allowed except for “temporary stockpiles” of biosolids.
- (b). Temporary stockpiles of biosolids may be stored for up to two weeks during land application periods. All stockpiles shall be located at least 300 feet from drainage ways unless proper runoff controls are provided and prior approvals is obtained from the department.

SECTION D – LAND APPLICATION REQUIREMENTS

1. Nutrient Limitations

- (a). The minimum acres required for spreading of process wastes and biosolids are specified in the Detailed Operation Description.
- (b). Nitrogen application rates shall be based on a “Conservative” or “Plant Available” management approach as specified in the permit application.
- (c). Supplemental fertilizer should be applied as necessary to balance nutrient needs of the vegetation grown.
- (d). Phosphorus application rate shall be in accordance with rules under 10 CSR 20-6.300 and as contained in the approved nutrient management plan.

2. Separation Distances

Separation distances shall be maintained between the land application site and other features as follows:

- (a). 300 feet from any losing streams, open sinkholes, water supply wells, or water supply reservoirs;
- (b). 50 feet from intermittent streams, public roads, or property boundaries; and
- (c). 100 feet from permanent flowing streams, public roads, or property boundaries; and
- (d). 100 feet from permanent flowing streams

3. Slope Limitations

- (a). Application sites with slopes greater than 6% should be in grass vegetation or must use soil conservation practices that meet Natural Resource Conservation Service standards.
- (b). Process wastes including biosolids shall not be used on fields or sites having a slope greater than 12% unless prior approval is obtained from the department.

4. Land Application Rate Limitations

- (a). Land application should be planned when the soil conditions are dry enough to allow normal agricultural tillage operations.
- (b). Wastewater applications should be carried out when soil moisture conditions are suitable to allow all wastewater to soak into the soil.
- (c). Application rates shall be adjusted for soil moisture and slope conditions so that there is no runoff of applied wastewater or solids.
- (d). Process wastes shall not be land applied when soils are frozen or saturated.

5. Operation of Land Application Equipment

- (a). Process wastes shall be applied uniformly over the number of acres suitable for land application as specified in permit application.
- (b). Land application equipment for spreading solids or wastewater shall be monitored such that any malfunctions in the operation of the equipment is detected and corrected before any over application of waste occurs to the spreading site.

6. Spray Irrigation Equipment

- (a). Spray irrigation systems (traveling gun, center pivot, fixed spray nozzles, etc.) should have automatic shut-off devices in the case of pressure loss.
- (b). Spray irrigation systems that do not have automatic shut-off systems to detect pressure loss or mechanical breakdowns shall have an operator on-site at all times during operation to monitor for proper operation.
- (c). Personnel operating and monitoring the irrigation equipment shall be trained in proper wastewater irrigation techniques by the University of Missouri Extension Service, U.S.D.A. Natural Resource Conservation Service, Manufacturer's representative, custom wastewater application company representative, or professional engineer.
- (d). Operators shall check the perimeter of application fields during land application to insure that applied wastewater does not run off from the fields where applied and does not enter waters of the state.

SECTION E – OPERATION OF UNCOVERED LIQUID STORAGE STRUCTURES

1. Minimum Operating Level

- (a). The liquid level in the storage structure shall be maintained between the minimum and maximum operating levels, as necessary, so that adequate storage capacity is available for use during adverse weather periods when conditions are not suitable for proper land application.
- (b). The liquid level in the storage structure should be lowered to the minimum operating level on a routine schedule based on the design storage period and operating plan as listed in the Detailed Operation description. This should be accomplished prior to expected frost periods and seasonal wet periods.

2. Maximum Operating Level

- (a). The maximum operating level for uncovered storage structures is one foot below the emergency overflow level unless specified otherwise in the Detailed Operation Description.
- (b). The operation shall be managed so that the level of liquids in the storage structure does not exceed the maximum operating level except when a 25-year, 24-hour storm or a 10-year, 10-day storm occurs.

3. Safety Volume Level

- (a). When design storm event occurs, the “safety volume” should be used to contain up to the 25-year, 24-hour storm or the 10-year, 10-day storm until conditions are suitable for land application.
- (b). The excess rainfall above the design storm events may be allowed to overflow through the emergency spillway when land application is not feasible.

SECTION F – VEGETATIVE FILTER SYSTEMS

- 1. Vegetative Filter areas are designed to receive storm water runoff during rainfall and within a few hours after each storm event. Vegetative filter requirements do not apply to “Soil-plant Filters” or land application sites used in conjunction with storage structure or lagoons.
- 2. The vegetative filter areas must receive prior approval from the department for the design, construction, and operating requirements of the specific system.
- 3. The vegetative filter shall allow all applied wastewater and storm water to infiltrate into the soil for the design storm event. Applied wastewater shall not exceed the plant available nitrogen loading rates for the type of grass grown.
- 4. Solids shall be settled out in an approved solids settling structure and shall not be applied to the vegetative filter field.
- 5. The vegetative filter shall be maintained in grass vegetation and shall be cut periodically so as to maintain a dense ground cover of vegetation. The filter areas should be dry before attempting to cut vegetation.
- 6. The approved slope of the filter fields must be maintained to provide even distribution and infiltration of applied wastewater. Any ruts, ditches, or depressions caused by equipment or other means shall be filled to avoid channeling and runoff.
- 7. Livestock shall not be allowed access to the vegetative filter areas, except as provided in the design plans approved by the department.