NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WASTE UTILIZATION

(Ac.)

CODE 633

DEFINITION

Using agricultural wastes such as manure and wastewater or other organic residues.

PURPOSE

- Protect water quality
- Protect air quality
- Provide fertility for crop, forage, fiber production and forest products
- Maintain or improve soil structure
- Provide feedstock for livestock
- Provide a source of energy

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where agricultural wastes including animal manure and contaminated water from livestock and poultry operations; solids and wastewater from municipal treatment plants; and agricultural processing residues are generated, and/or utilized

CRITERIA

General Criteria Applicable to All Purposes

Apply this practice as part of a conservation system of planned practices that may address multiple resource concerns. This practice is always applied in conjunction with a nutrient management plan that conforms to NRCS practice code 590, Nutrient Management.

All federal, state and local laws, rules and regulations governing waste management, pollution abatement, health and safety shall be strictly adhered to. In North Carolina, all state and/or NPDES permitting requirements should be met for all subject livestock operations. The owner or operator shall be responsible for securing all required permits or approvals related to waste utilization, and for operating and maintaining any components in accordance with applicable laws and regulations.

Operations that are subject to Section .1300 of the15A NCAC 02T rules (formerly the .0200 Rules) must have a waste analysis conducted within 60 days of any given application date. As a minimum, the waste analysis should identify nutrient and specific ion concentrations. Where the metal content of municipal wastewater, sludge, septage and other agricultural waste is of a concern, the analysis shall also include determining the concentration of metals in the material.

When agricultural wastes are land applied, application rates shall be consistent with the requirements of the NRCS conservation practice standard for nutrient management (590). Use approved Phosphorus loss assessment procedure to assess potential for phosphorus transport on all fields owned, controlled, or leased by the producer that are to receive applied

animal waste materials, with the exception of forest land. It is recommended that latest version of the NCANAT software be utilized to estimate nitrogen loss (NLEW) and the potential for phosphorus loss (PLAT). NCANAT software is available for download at *http://nutrients.soil.ncsu.edu/.*

Where agricultural wastes are to be spread on land not owned or controlled by the producer (*see Exhibits A & B*), the waste management plan, as a minimum, shall document the amount of waste to be transferred and who will be responsible for the environmentally acceptable use of the waste. A waste receiver agreement shall be secured to ensure waste is applied in accordance with the 590/633 standards. Exhibit B in this standard is required for NRCS conservation planning/CNMP purposes when third party application methods are used. Additional documentation for third-party applicator situations may also be required by NC law. Producers are advised that all agricultural wastes that are applied on land owned by or controlled by the producer shall be included in a waste management plan. Signed third-party applicator agreements do not preclude the requirement of a waste management plan for waste applied on land owned or controlled by the producer. "Manure haulers" must be in compliance with all aspects of Section .1400 of 15A NCAC 02T.

Records of the use of wastes shall be kept a minimum of five years as discussed in OPERATION AND MAINTENANCE. For facilities that hold NC General of NPDES permits, records should be retained as specified in the permit.

Additional Criteria to Protect Water Quality

All agricultural waste shall be utilized in a manner that minimizes the opportunity for contamination of surface and ground water supplies.

Agricultural waste shall not be land-applied on soils that are frequently flooded, as defined by the National Cooperative Soil Survey, during the period when flooding is expected.

Manure or organic waste will not be applied within 100 feet of water wells.

A series of animal waste manure data tables utilizing NCSU/NCDA/USDA databases is available at the Nutrient Management in North Carolina website (*http://nutrients.soil.ncsu.edu/*). The information in these tables allow the planner to estimate fertilizer nutrients (total and plant available), application rates, and land areas needed for agronomic use. These tables are specific to many common types of livestock operations and respective land application methods.

When liquid wastes are applied, the application rate shall not exceed the infiltration rate of the soil, and the amount of waste applied shall not exceed the moisture holding capacity of the soil profile at the time of application. Wastes shall not be applied to frozen, snow-covered or saturated soil if the potential risk for runoff exists. The basis for the decision to apply waste under these conditions shall be documented in the waste management plan. North Carolina law requires that liquid waste systems shall be designed to operate with zero discharge to surface waters.

When land receiving waste from confined animal feeding operations is grazed by livestock, no supplemental feeding of livestock using off-site forages or feed should occur unless additional nutrients are accounted for in nutrient management plan, and nutrients quantified in approved recordkeeping forms. .

Waste applications must be made in accordance with land application setbacks as set by the state of North Carolina, as well as applicable federal and local laws. Current setbacks are available at the NC Division of Soil & Water Conservation 1217 guidance website,

http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html

Recent NCSU research indicates that acutely acidic soil conditions contribute to high levels of water solubility of soil P reactive products when organic waste P is applied. Thus, when soil tests show that pH is below soil target pH and lime is recommended, soils should be limed to increase soil pH to soil target levels prior to application of organic waste materials. Target pHs as established by NCDA Agronomic Division are 5.0 for Organic soil class (ORG), 5.5 for Mineral-Organic soil class (M-O), and range from 6.0 to 6.5 for Mineral soil class (MIN) depending on the crop.

Additional Criteria to Protect Air Quality

Manure or organic waste will not be applied within 200 feet of a dwelling other than that owned by the producer. However, application within 200 feet of a dwelling is allowed if a home is constructed within 200 feet of any waste application sprayfield that is in a current plan. Any sprayfield added to a nutrient management/waste utilization plan after initial construction begins on a home must abide by the 200 foot application setback.

North Carolina law conditionally (see latest SB 1217 Interagency Group Guidance Document) prohibits application of swine waste within 75 feet of any property boundary on which an occupied residence is located, except of that owned by the producer.

When applying liquid forms of manure with irrigation equipment select application conditions where there is high humidity, little/no wind blowing, a forthcoming rainfall event and/or other conditions that will minimize volatilization losses into the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

Handle and apply poultry litter or other dry types of animal manure or other organic by-products when weather conditions are calm and there is less potential for blowing and emission of particulates in the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

When sub-surface applied using an injection system, waste shall be placed at a depth and applied at a rate that minimizes leaks onto the soil surface, while minimizing disturbance to the soil surface and plant community.

All materials shall be handled in a manner to minimize the generation of particulate matter, odors and greenhouse gases.

Utilize appropriate odor control checklist to ensure that odor is kept to the minimum extent possible. Odor control checklists for swine and poultry operations are available at the NC Division of Soil & Water Conservation 1217 guidance website:
http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html

Additional Criteria for Providing Fertility for Crop, Forage and Fiber Production and Forest Products

Where agricultural wastes are utilized to provide fertility for crop, forage, fiber production and forest products, the practice standard Nutrient Management (590) shall be followed. Realistic Yield Expectations (RYE) for intended crops on specific soil types are available on the NC State University nutrient management website, http://nutrients.soil.ncsu.edu

Where municipal wastewater and solids are applied to agricultural lands as a nutrient source, the single application or lifetime limits of heavy metals shall not be exceeded. The concentration of salts shall not exceed the level that will impair seed germination or plant growth.

****PINE FOREST APPLICATION** When land receiving waste is predominantly pine forest, organic fertilization must be a part

of forestry management plan developed by a qualified professional.

Nutrients should not be applied to pine forests that are composed of organic or poorly drained mineral soils. For pine plantations, **do not apply nitrogen during the first five years after planting**. Do not exceed 60 lbs PAN/acre/year on pine forestland, and on long-leaf pine do not exceed 30 lbs PAN/acre/year due to increased disease pressure caused by Nitrogen application. Higher PAN application rates on pine forestland may be approved in situations where concentrated short-term waste applications may be necessary, such as lagoon closures or lagoon sludge management.

Annual soil tests, taken at a 0"-6" sampling depth, must be completed in pine forest application area to help determine potential for P leaching. If soil test agronomic P indices are above 50, then no additional waste application should occur on forestland. A phosphorous loss assessment (PLAT) is not needed for forestland receiving waste materials.

Negative impacts to streams, wetlands, and riparian buffers must be avoided when applying waste materials, and appropriate application setbacks must be observed.

Additional Criteria for Improving or Maintaining Soil Structure

Wastes shall be applied at rates not to exceed the crop nutrient requirements or salt concentrations.

Residue management practices shall be used for maintenance of soil structure and enhancement of soil quality.

Animal waste application shall not exceed the crop's Realistic Yield Expectations (nitrogen) and/or crop uptake (phosphorus) as required.

Additional Criteria for Providing Feedstock for Livestock

Agricultural wastes to be used for feedstock shall be handled in a manner to minimize contamination and preserve its feed value. Chicken litter stored for this purpose shall be covered. A qualified animal nutritionist shall develop rations that utilize wastes in supplemental feed.

Additional Criteria for Providing a Source of Energy

Use of agricultural waste for energy production shall be an integral part of the overall waste management system design when applicable.

All energy producing components of the system shall be included in the waste management plan and provisions for utilization of residues of energy production identified.

Where the residues of energy production are to be land-applied for crop nutrient use or soil conditioning, agronomic rates and all other waste application criteria shall apply.

CONSIDERATIONS

The effect of Waste Utilization on the water budget should be considered, particularly where a shallow ground water table is present or in areas prone to runoff. Limit waste application to the volume of liquid that can be stored in the root zone.

Because the effects of increased fertility in native plant communities are not well understood, application of waste materials in forestland where health of native plant communities are a resource concern should be closely monitored for negative impacts. Any increase in the presence of noxious plant species in the communities should be noted and considered when applying waste. Negative impacts to threatened and endangered species of plants or animals are prohibited by federal law.

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Consider incorporating surface applications of solid forms of manure or other organic by-products into the soil within 24 hours of application to minimize emissions and to reduce odors**.** State and NPDES permits for livestock require animal manure and sludge materials that are applied on conventionally tilled bare soil be incorporated into the soil within two days after application on the land. This requirement does not apply to no-till fields, pastures or fields where crops are actively growing.

Agricultural wastes contain pathogens and other disease-causing organisms. Wastes should be utilized in a manner that minimizes their disease potential, especially for off-farm use.

Priority areas for land application of wastes should be on gentle slopes located as far as possible from waterways. When wastes are applied on more sloping land or land adjacent to waterways, other conservation practices should be installed to reduce the potential for offsite transport of waste.

Acreage in land application fields where livestock may congregate, such as lounging areas or feeding areas, where vegetation has been destroyed or severely damaged should not be included in the nutrient management/waste utilization plan.

Research results have shown that alum or other similar compounds may bind to phosphate in poultry litter, thus making phosphorous less susceptible to losses in runoff where litter is applied. It is important to note that PLAT does not currently recognize treatment of poultry litter with any additive as having a "reducing" effect on P loss. These products have also been shown to reduce ammonia levels in poultry houses.

It is preferable to apply wastes on pastures and hayland soon after cutting or grazing before re-growth has occurred.

A completed Certified Nutrient Management Plan (CNMP) shall be developed whenever possible.

Consider the net effect of waste utilization on greenhouse gas emissions and carbon sequestration.

Guidance documents issued by the 1217 Interagency Committee detail what must be included in a total Certified Animal Waste Management Plan (CAWMP). The NC Division of Water Quality Animal Feeding Operations Unit website (*http://h2o.enr.state.nc.us/aps/afou/afou_home.htm*) is also a source of information for applicable laws, rules, and necessary recordkeeping and permitting forms. Many of the required recordkeeping forms are also available through plans developed by the NC Nutrient Management software, available for download at the NC Nutrient Management website, *http://nutrients.soil.ncsu.edu/*

North Carolina state permitting rules require all facilities that are operating under an issued Certificate of Coverage conditionally survey sludge (solid waste material) levels annually. Sludge levels should be monitored in accordance with permit requirements, and in the event that sludge removal becomes necessary, a removal plan that will allow application of nutrients at agronomic rates should be developed and implemented. It is a good management practice for all facilities to monitor sludge levels periodically.

North Carolina law requires that dry litter operations that house over 30,000 birds develop and maintain a poultry dry litter management plan. Guidance issued by the 1217 Committee regarding the development of these plans is available at the NC Division of Soil & Water Conservation 1217 guidance website, (*http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html*) under Appendix 5.3, Poultry Dry Litter Management Plans and Recordkeeping Forms. Requirements for third-party litter applicators and operation owners are detailed in the guidance.

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PLANS AND SPECIFICATIONS

Plans and specifications for Waste Utilization shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. The waste management plan is to account for the utilization or other disposal of all animal wastes produced, and all waste application areas shall be clearly indicated on a plan map.

Items that comprise a Waste Utilization Plan are described in issued NC guidance documents, available at the website *http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html*.

This standard is always applied jointly with the 590 Nutrient Management standard. Accordingly, at a minimum, the following components shall be included in the nutrient management/waste utilization plan:

1. Aerial photograph or map and a soils map of the site identifying areas of planned nutrient application

2. Planned plant production sequence or crop rotation

3. Results of soil, plant, water, manure or organic by-product sample analyses. The plan must be developed using current soil test results (no older than 3 years). More frequent soil tests may be required based on facility permit conditions or if applications of sludge materials have been made to the plan area.

4. Results of PLAT and LI assessments (if required)

5. RYEs for the crops in the rotation and the source of information if other than default values

6. Quantity of all nutrient sources planned

7. Recommended nutrient rates, timing, and method of application and incorporation

8. Location of designated sensitive areas or resources (e.g. streams, wells, sinkholes, etc.) and the associated nutrient management restriction, if present in the conservation management unit

9. Operation and maintenance information

10. Complete nutrient budget for nitrogen, phosphorus, and potassium for the rotation or crop sequence.

The NRCS standard 590 (Nutrient Management)/633 (Waste Utilization) job sheet (available at eFOTG website) also provides information on items that must be included in a nutrient management plan for USDA-NRCS purposes.

OPERATION AND MAINTENANCE

The landowner and animal operation manager are responsible for the safe operation and maintenance of this practice, including all application equipment. Clients shall be notified of the following operations and maintenance requirements.

- Review the waste management plan annually to adjust if necessary. See a technical specialist to determine if any adjustments may constitute a formal plan revision.
- Protect fertilizer and organic by-product facilities from weather and other conditions that may result in accidental leaks or spills.
- Ensure proper calibration of application equipment.
- Inspect and maintain the equipment and facilities that are involved in implementing the animal waste management plan
- Review the Emergency Action Plan

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- Records should be maintained for a period of at least 5 years, although NC permitting conditions specify a 3-year retain period. NPDES-permitted facilities require 5-year retention. The following records should be retained:

1. Soil test results and recommendations
2. Sources, quantities, and analyses of nutrients applied, including inorganic fertilizer if used.
3. Dates and methods of nutrient applications.
4. Cropping data, including type, planting and harvest dates, yields, and residues removed
5. Results of water, plant, and organic by-product analyses
6. Data on operation and maintenance reviews, including date, person performing review, and resulting recommendations.

- For animal operations that have either an NC General Permit or NPDES permit, the Permit will specify the type of monitoring, reporting, and recordkeeping requirements that are applicable
- Ensure worker safety and protection in all aspects of animal operation and nutrient management application, including operation of equipment

NRCS Agricultural Field Waste Management Field Handbook
http://www.wcc.nrcs.usda.gov/awm/awmfh.html

Nutrient Management in North Carolina website http://nutrients.soil.ncsu.edu/

NC Division of Water Quality Animal Feeding Operations Unit website
http://h2o.enr.state.nc.us/aps/afou/afou_home.htm

Interagency 1217 Guidance Memos
http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html

REFERENCES

NRCS Standard 590, Nutrient Management, EFOTG
http://www.nrcs.usda.gov/technical/efotg/

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Exhibit A

WASTE UTILIZATION AGREEMENT

(Attach to WUP if non-owned land and/or leased land is included in plan)

I, _____ (landowner), give permission to _____ (producer) to apply animal waste materials on _____total acres of my land for the duration of this agreement (shown below). Tracts, fields, and useable acres that may receive waste materials are included in the WUP/Nutrient Management Plan, and maps of these fields are attached to the plan.

I understand that a recent Soil Test and a subsequent Phosphorous Loss Assessment Tool (PLAT) evaluation must be completed prior to adding this land to the Plan. All nutrients must be applied at agronomic rates specified in the Plan. Rates of commercial fertilizer application will likely be reduced due to application of plant available nutrients from animal waste.

Landowner signature:_____ Date:_____

Agreement Expiration:_____

EXHIBIT B

WASTE UTLIZATION AGREEMENT FOR CONSERVATION PLANNING/CNMP**

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JOINT RESPONSIBILITY--PRODUCER/THIRD-PARTY APPLICATOR

We agree that the third party listed below is responsible for application of waste materials produced by_____ and that waste materials will be applied in a manner consistent with requirements set forth by the state of North Carolina in 15A NCAC 02T Section .1400 (Manure Hauler Regulations) and NRCS standard 633 (Waste Utilization). The producer maintains responsibility for keeping records on the amount of waste generated by the operation, and providing the responsible third party with waste analysis records, and the third party applicator is responsible for applying materials at agronomic rates, soil testing, field evaluations, etc.

It is recommended that the third party applicator keep records on forms DRY-2 and/or DRY-3, available at the website ***http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html*** under Appendix 5.3, Poultry Management Plan and Recordkeeping Forms. The producer is responsible for keeping records of application on land he owns or controls, and having owned and/or controlled land receiving waste materials included in a waste management plan.

Estimated annual waste generated by operation:_____

Estimated annual waste transferred off-site by third party:_____

Waste Generator (Producer): _____Date:_____

Third-party applicator/Responsible Party: _____Date:_____

Agreement expiration: _____

****USDA does not have a regulatory role in nutrient management. Although Comprehensive Nutrient Management Plans (CNMPs) are only required by USDA for animal operations participating in the Environmental Quality Incentives Program under the 2002 Farm Bill, your CNMP may assist you in meeting federal or state water quality regulations or permit requirements.**

****Shared responsibility/third party applicator documentation compliant with NC regulations for operations that house greater than 30,000 birds is included in Dry Litter Plan guidance from the SB 1217 Interagency Committee, also available at the website *http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html***

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