



Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

WASTE TREATMENT

CODE 629

(no)

DEFINITION

The use of unique or innovative mechanical, chemical or biological technologies that change the characteristics of manure and agricultural waste.

PURPOSE

To use manure and waste treatment facilities to improve water quality and air quality by:

- Reducing the nutrient content, organic strength, and/or pathogen levels of manure and agricultural waste
- Reducing odors and gaseous emissions
- Facilitating desirable waste handling and storage
- Producing value added byproducts that facilitate manure and waste utilization

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where there is a need to implement waste treatment technologies that are not within the scope of other NRCS Conservation Practice Standards and that are sufficiently developed for incorporation into a manure or agricultural waste management system. This includes new or unique components or processes.

CRITERIA

General Criteria Applicable to All Waste Treatment Purposes.

Laws and Regulations

Ensure that the manure and waste treatment facilities and processes are planned, designed, and constructed to meet all federal, state, and local laws and regulations.

Utilities

Locate all buried utilities in the project area including drainage tile and other structural measures.

Design

The waste treatment technology provider shall complete and supply to the land owner/operator a detailed design of the facility/process clearly identifying the objectives and anticipated outcomes of implementation.

When the planned technology involves a system or process include in the design documentation a process diagram containing, at a minimum, the following information:

1. Volumetric flow rates including influent, effluent, and recycle streams.
2. Waste load projections including volume, mass, and characteristics of the waste important to the

waste treatment facility or process.

3. Unit process volumes and hydraulic retention times where appropriate.
4. Air emissions projections from the system.
5. Nutrient fate projections within the system.
6. Process monitoring and control system requirements as described below in the Monitoring section of the criteria.

It is the responsibility of the technology provider to furnish information from a university or other independent research entity to document the effectiveness of the technology to achieve its intended purpose. Provide independent, verifiable data demonstrating results of the use of the facility or process in other similar situations and locations. If available document the effectiveness of the technology under different climatic factors. Documentation from peer reviewed journals is preferable. Where use of a waste treatment facility or process to improve one resource concern negatively impacts another, impacts and mitigation measures, if required by state or local agencies, are to be documented.

Components

Waste treatment facilities and processes may consist of multiple components. Where criteria for individual components are described in existing NRCS practice standards, use those practice standards and their specific criteria for planning, designing, and installation of that component.

Where components of a facility or process are not described in a current NRCS practice standard, the system provider shall furnish a minimum one year warranty on all construction, equipment, and applied processes.

Expected System Performance

Clearly document the expected system performance prior to system installation. At a minimum, document all expected system volumetric flow rates, macro-nutrient reductions or changes in form, expected pathogen reductions, gaseous ammonia and hydrogen sulfide emissions reductions (or increases).

Operating Costs

The system provider shall furnish an annual estimate of operating costs and the time, labor, energy, and equipment requirements for each waste treatment component of the waste management system and on the operation cost or savings the waste treatment component will have on the waste management system as a whole. Identify as estimates the operating costs not based on actual data. Adequately document the anticipated operation cost or savings of the waste treatment component on the entire system.

Monitoring

Install as a part of the system equipment needed to properly monitor and control the waste treatment facility or process. Identify the process control parameters to be monitored in the design documentation. Identify parameters considered critical to proper system operation in the Operation and Maintenance (O&M) Plan. Monitor critical equipment status and unit processes.

Byproducts

Implementation of a waste treatment process or operation of a waste treatment facility shall not result in discharge of byproducts harmful to the environment.

Handle and store all byproducts in such a manner as to prevent nuisances to neighbors or to the public at large.

The land application of byproducts to supply plant nutrients must meet the criteria in NRCS Conservation Practice Standard 590, Nutrient Management.

Handle and dispose of any unmarketable or unused byproducts in accordance with all applicable federal, state, and local laws and regulations. A plan for dealing with such byproducts shall be prepared and approved prior to utilization of the process or installation of the waste treatment facility, and shall include a listing of any permits or permissions required for the execution of the plan.

Recycle the waste treatment byproducts to the extent possible without causing a hazard to the environment.

Safety

Include the design of the process or facility safety features to minimize hazards. Provide guards and shields for moving parts of the equipment used in the treatment process. Fence waste treatment facilities and post warning signs where needed to prevent children and others from entering a hazardous area.

Carry out all treatment processes in accordance with all safety regulations. Wear protective clothing when handling potentially harmful chemicals that may be used in the process. Provide proper ventilation.

CONSIDERATIONS

Location

Locate the waste treatment facility as near the source of manure or other waste as practicable and as far from neighboring dwellings or public areas as possible. For proper location also consider slope, distance of manure and other waste transmission, vehicle access, wind direction, proximity of streams and flood plains, and visibility.

In determining the location of the facility, consider elevation and distance from various components to take advantage of gravity flow where possible.

Manure Characteristics

Waste treatment may require specific total solids and nutrient contents of the waste stream. Pretreatment options such as dilution or settling could be used to adjust the solids content before entering the waste treatment facility or process.

Visual Screening

Evaluate the visual impact of the waste treatment facility or process within the overall landscape context. Look at implementing screening with vegetative plantings, landforms, or other measures to alleviate a negative impact or enhance the view.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for waste treatment facilities in accordance with the criteria of this standard and good engineering practice.

As a minimum, provide the following in the plans and specifications:

1. Layout and installation details of livestock facilities, waste collection points, waste transfer components, waste treatment and storage facilities, including supporting documentation.
2. Location of all inflow and discharge pipelines, pipeline materials, diameter and slope.
3. Details of support systems for all components of the treatment facility.
4. Fencing and signage as appropriate for safety purposes.
5. Required tests to determine the effectiveness of the waste treatment as appropriate.
6. Other plans to manage the system including a nutrient management plan for proper land application of byproducts.

OPERATION AND MAINTENANCE

Develop and review an O&M plan with the owner/operator prior to construction of an innovative waste treatment facility or implementation of an innovative waste treatment process. Ensure the O&M plan is consistent with the proper operation of all system components and contains requirements including but not limited to:

- Recommended loading rates of the waste treatment facility or process for hydraulic and critical pollutant parameters.
- Proper operating procedures for the waste treatment facility or process, including the amount and timing of any chemicals added.
- Operation and maintenance manuals for pumps, blowers, instrumentation and control devices, and other equipment used as components of the waste treatment facility or process.
- Description of the planned startup procedures, normal operation, safety issues, and normal maintenance items. This includes procedures for the planned replacement of components with less than a ten year service life.
- Alternative operation procedures in the event of equipment failure.
- Troubleshooting guide
- Monitoring and reporting plan designed to demonstrate system performance on an ongoing basis
- The service life of each component as identified by the manufacture of service provider. The minimum service life for the waste treatment facility or process is ten years. Where components have less than a ten year service life, clearly identify their planned replacement schedule.

CERTIFICATION

Certification documentation upon completion requires:

- Location of Treatment Facility
- Components of facility
- Dimensions of facility
- Source of material to be treated
- Destination of treated material
- Conservation measures implemented

REFERENCES

None.