

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
WASTE FACILITY CLOSURE

(No.)

CODE 360

DEFINITION

The decommissioning of facilities, and/or the rehabilitation of contaminated soil, in an environmentally safe manner, where agricultural waste has been handled, treated, and/or stored and is no longer used for the intended purpose.

PURPOSE

- Protect the quality of surface water and groundwater resources.
- Mitigate air emissions.
- Eliminate a safety hazard for humans and livestock.
- Safeguard the public health.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to agricultural waste facilities or livestock production sites that are no longer needed as a part of a waste management system and are to be permanently closed or converted for another use. These facilities include liquid/dry waste storage facilities, confined animal housing, feedlots, livestock yards, or composting facilities.

This practice applies where impoundments that are to be converted to fresh water storage meet current Natural Resources Conservation Service (NRCS) Conservation Practice Standards (CPS).

Where structures that include agricultural waste storage, such as confined animal housing, are to be decommissioned, this practice will apply to

the removal of the waste and rehabilitation of soil within the facility.

This practice applies to remediation of soil contaminated by agricultural wastes that have been stored on site.

It does not apply to sites contaminated by materials that require the issuance of a hazardous waste permit, such as fuel or pesticides.

CRITERIA

General Criteria Applicable to All Purposes

The closure shall comply with all federal, state, and local laws, rules, and regulations including national pollutant discharge elimination system (NPDES) requirements.

Existing waste transfer components that convey to waste facilities or provide drainage from the facility area shall be removed and replaced with compacted earth material or otherwise rendered unable to convey waste.

Remove manure, agricultural waste, and contaminated soil to the maximum extent practicable. All manure and agricultural waste that could negatively impact water and/or air quality or pose a safety hazard shall be removed as deemed practicable. All liquid, slurry, sludge, and solid waste, and soil removed from the facility shall be utilized in accordance with NRCS CPS, Nutrient Management (590).

Precautions (fencing and warning signs) shall be used where necessary to ensure that the facility is not used for purposes incompatible with the facility modification.

Erosion and Pollution Control. All disturbed areas shall be re-vegetated or treated with other suitable measures used to control erosion and restore the aesthetic value of the site. Sites, not suitable for re-vegetation through normal cropping practices, shall be vegetated in

accordance with NRCS CPS Critical Area Planting (342).

Liquid and Slurry Waste Removal. Liquid and slurry wastes shall be agitated and pumped to the maximum extent practicable. Water shall be added as necessary to facilitate the agitation and pumping. The wastewater shall be utilized in accordance with NRCS CPS, Nutrient Management (590) and/or Waste Utilization (633).

Sludge Removal. During sludge removal operations, the integrity of the liner, if one is present, shall be maintained. Sludge shall be removed to the maximum extent practicable and utilized in accordance with NRCS CPS, Nutrient Management (590), and/or Waste Utilization (633).

Impoundment Closure. Three options are associated with the decommissioning of liquid waste impoundments. One of the following will be used.

- Embankment Impoundments (those with a depth of water at the design water level of three feet or more above natural ground) may be breached so that they no longer impound water. The embankment material can then be graded into the impoundment area, and the area vegetated for another use. Or the embankment may remain if the impoundment area surface has been sufficiently cleaned so that runoff leaving the site would not be considered as contaminated by the wastes.
- Excavated Impoundments may be backfilled so that these areas may be reclaimed for other uses.
- Impoundments may be converted to fresh water storage.

Embankment Impoundments. Waste and sludge shall be removed from the impoundment before the embankment is breached. Concrete and flexible membrane liners shall be removed or rendered unable to impound water and properly disposed of. The slopes and bottom of the breach shall be stable for the soil material involved; however, the side slopes shall be no

steeper than three horizontal to one vertical (3:1).

Excavated Impoundments. Concrete and flexible membrane liners shall be removed or rendered unable to impound water and properly disposed of. The backfill height shall exceed the height to the design finished grade by a minimum of five percent to allow for settlement. The top one foot of the backfill shall be constructed of the most impervious soil material readily available and mounded to shed rainfall runoff. Incorporate available topsoil where feasible to aid establishment of vegetation.

Conversion to Fresh Water Storage. The converted impoundment shall meet the requirements as set forth in the appropriate NRCS practice standard for the intended purpose. Where the original impoundment was not constructed to meet NRCS CPS, the investigation for structural integrity shall be in accordance with National Engineering Manual (NEM) 501.23. When it is not practical to remove the sludge from a waste impoundment that is being converted to fresh water storage, the impoundment shall not be used for fish production, swimming, or livestock watering until the water quality is adequate for these purposes.

Fabricated Liquid Waste Facilities. If fabricated structures are to be demolished, disassembled, or otherwise altered, it shall be done to such an extent that no water can be impounded. Disassembled materials such as pieces of metal shall be temporarily stored in such a manner that they do not pose a hazard to animals or humans until their final disposition.

Demolished materials shall be buried on site or moved off site to locations designated by state or local officials. If buried on site, the materials are to be covered with soil to a settled depth of at least one foot. The backfill height shall exceed the height to the design finished grade by a minimum of five percent to allow for settlement, and the backfill be sufficiently mounded such that runoff will be diverted from the site after the backfill settles.

Dry Waste Storage or Treatment Facilities. The soil at dry waste facilities such as confined animal housing, feedlots, livestock yards, or

composting facilities with earthen floors must be evaluated.

Substantial amounts of nutrients and salts can remain in the manure pack and even the soil within a feedlot. The accumulation of excess nutrients and salts in the soil may complicate establishment of permanent vegetation or field crops. Therefore before seeding vegetation it is important to evaluate the chemical and physical properties of the soils to make sure they can support the desired vegetation.

The evaluation shall include laboratory analyses of the soil profile for N,P,K, EC and pH to determine the required depth of rehabilitation. SAR test may also be performed to help determine treatment. Soil samples shall be taken at a minimum of 10 locations within the feedlot. Initially a standard 0-6 inch and 6-24 inch composite sample can be taken to determine if an issue with nutrients or salt is present. If it is not possible to ascertain the proper depth for manure/soil removal or remediation using the composite test then a more comprehensive testing regime will be initiated. Take 0-6", 6-12", 12-18" soil samples on 1.0 acre grids. The samples shall be collected, prepared, and tested in accordance with NRCS conservation practice standard, Nutrient Management (590). The results of the soil analysis will be used to prepare a plan to recover the site for its intended use. The following site appropriate options shall be utilized, if needed.

If nutrient or salt stratification is an issue, performing tillage (i.e., plowing, ripping etc.) can be used to mix layers and dilute undesirable levels of nutrients and salts to allow vegetation establishment. Careful consideration must be given to prevent erosion and nutrient and sediment loss from the site.

Adjust the pH to desired range of 5.5 to 8.5. Refer to NDSU Extension Service SF-1321 "Effectiveness of Gypsum in the North-Central Region of the U.S." and UNL Fact Sheet G-1504 "Lime Use for Soil Acidity Management."

For information on plant salt tolerant species refer to South Dakota Extension Fact Sheet 903 "Salt Salinity Tolerance of Common Agricultural Crops in South Dakota." If levels are unsuitable for perennial vegetation a salt tolerant cover

crop such as Barley can be planted for 1-3 years to allow nutrient and salt levels to dissipate prior to seeding perennial grass species. For vegetation establishment recommendations on soils with an EC of 4.0 millimhos/cm or higher refer to SD NRCS Agronomy Technical Note 15, SD NRCS Agronomy Technical Note 16, or SD NRCS Range Technical Note 4.

CONSIDERATIONS

Conduct pre-closure soil and water (surface and subsurface) testing to establish base line data surrounding the site at the time of closure. Establishing baseline data can be used in the future to address soil and water issues.

Where the surface is covered by a dense mat of floating vegetation, pumping effort to empty waste impoundments may be reduced by first applying herbicide to the vegetation and then burning the residue. Appropriate permits must be obtained before burning. When burning is conducted, take necessary actions to ensure that smoke is managed to minimize impacts to downwind populations.

Alternative methods of sludge removal may be required where the impoundments contain large amounts of bedding, oyster shells, soil, or other debris.

Minimize the impact of odors associated with land applying dry wastes and with agitation, emptying, and land applying wastewater and sludge from a waste impoundment by conducting these operations at a time when the humidity is low, when winds are calm, and when wind direction is away from populated areas. Adding chemical and biological additives to the waste prior to agitation and emptying can reduce odors. Odor impacts from land application can also be mitigated by using an incorporation application method.

Minimize agitation of the wastes to only the amount needed for pumping to reduce the potential for release of air emissions.

Soil to fill excavated areas should not come from important farmlands (prime, statewide, local, and/or unique).

Waste facility closure may improve utilization and aesthetics of the farmstead.

Breached embankments may detract from the overall aesthetics of the operation. Embankments should be removed and the site returned to its original grade.

Disassembled fabricated structures may be suitable for assembly at another site. Care should be taken during closure to minimize damage to the pieces of the facility, particularly coatings that prevent corrosion of metal pieces.

Measures should be taken during contractor's activities to minimize site erosion and pollution of downstream water resources. This may include such items as silt fences, hay bale barriers, temporary vegetation, and mulching.

To minimize potential impacts to livestock, such as nitrate poisoning, initiate a testing and monitoring program of nutrient levels in crop products, particularly livestock feeds, harvested from sites of closed animal confinement facilities.

PLANS AND SPECIFICATIONS

Plans and specifications for the decommissioning of abandoned waste facilities and the rehabilitation of contaminated soil shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum, include the following:

A plan view showing the location and extent of the practice.

Pertinent elevations of the closed facility and excavation limits.

Number, capacity, and quality of facility(ies) and estimate of soil volume to be moved.

Location of known utilities.

Requirements for salvage and disposal of structural materials.

Vegetative requirements.

Utilization Plan for animal wastes and soil.

Odor management or mitigation requirement.

Safety plan requirements. Note: Per Occupational Safety and Health Administration (OSHA) confined space entry protocol, personnel shall not enter confined space of an enclosed waste facility without breathing apparatus or taking other appropriate measures.

OPERATION AND MAINTENANCE

The proper decommissioning and rehabilitation of a waste facility should require little or no operation and maintenance. However, if it is converted to another use, such as a fresh water facility, operation and maintenance shall be in accordance with the needs as set forth in the appropriate NRCS CPS for the intended purpose.

REFERENCES

Rice, J.M., D.F. Caldwell, and F.J. Humenik. Ed. 2006. Closure of Earthen Manure Structures in Animal Agriculture and the Environment: National Center for Manure and Animal Waste Management White Papers, pp. 263-282. ASABE. Pub. Number 913C0306.