



Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
AMENDMENTS FOR TREATMENT OF AGRICULTURAL WASTE

CODE 591

(au)

DEFINITION

The addition of chemical or biological additives to manure, process wastewater, contaminated storm water runoff, or other wastes to reduce adverse effects on air and/or water.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Facilitate the management, handling, and processing of manure and waste
- Reduce risk associated with the spread and contamination from pathogens
- Improve or protect air quality
- Improve or protect water quality
- Improve or protect animal health

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where the use of a chemical or biological amendment is needed to alter the physical and chemical characteristics of the waste stream as a part of a planned manure or waste management system. This practice does not include amendments added to the animal feed.

CRITERIA

General Criteria Applicable to All Purposes

Laws, rules, and regulations

Plan and implement the use of amendments as a part of a manure or waste management system that meets all Federal, State, and local laws, rules, and regulations.

Labeling and instructions for use

The label or accompanying instructions for the use of the amendments must contain, as a minimum, the following information:

- Active ingredients and their percentage of the whole. Proprietary terminology may be used as long as the actual chemical and/or biological names are included.
- The purpose for which the amendment is intended.
- Recommended application rate of the amendment to achieve the intended purpose.
- Application timing and methodology of the amendment to optimize the effectiveness.
- Special handling and storage requirements for the amendment.
- Any safety concerns relating to the use of the amendment and recommended measures to overcome the safety concerns, including any required personal protective equipment for workers and protective measures for animals.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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Validation of product

Only products approved for use by NRCS may be used under this standard. Approval will be based on—

- University research.
- Verifiable research from other independent entities.
- Peer-reviewed journals.

Expected amendment performance

The provider of the chemical or biological amendment will clearly document the expected system performance prior to application of the amendment. It may be necessary to test the amendment on the waste stream prior to specification of the amendment application rate. The amendment provider will provide the characteristics of the influent waste stream important to the waste treatment process. At a minimum, the technology provider will document all expected system volumetric flow rates, macronutrient reductions or changes in macronutrient form, expected pathogen reductions, and decreases or increases of emissions of particulate matter, ammonia, volatile organic compounds, oxides of nitrogen (NO_x), hydrogen sulfide, methane, nitrous oxide, and carbon dioxide.

Where use of a chemical or biological amendment to improve one resource concern, such as water quality, negatively impacts another, such as air quality, document the strategy to address the impacts and mitigation measures. For example, if the application of an amendment causes a temporary release of odor, then provide mitigation for the dispersal of odors or other mitigation such as timing the application to minimize effects.

Handling and storage

Handle and store all byproducts to prevent exposure of hazardous or flammable material or odor nuisances to neighbors and the public at large.

Byproducts

The addition of the chemical or biological amendment to the waste stream must not harm the environment with the handling or discharge of waste byproducts. The facility plan will include a listing of any permits or permissions required for byproduct disposal. Use NRCS Conservation Practice Standard (CPS) Nutrient Management (Code 590) for land application of byproducts or follow other disposal options outlined in a comprehensive nutrient management plan.

When not land applied, recycle the waste treatment byproducts to the extent possible.

Unmarketable/unusable byproducts must be disposed of in accordance with all applicable Federal, State, Tribal, and local laws and regulations. Prepare a plan for regulatory approval for dealing with unmarketable byproducts prior to utilization of the process or installation of the waste treatment facility.

CONSIDERATIONS

The use of amendments to reduce ammonia and other emissions from manure in confined spaces may allow altered ventilation strategies at an appreciable energy savings.

The use of an amendment to reduce ammonia emissions from manure may result in a higher nitrogen content in the manure. Nutrient management plans may need to be revised to account for the decreased loss of nitrogen in the manure.

PLANS AND SPECIFICATIONS

Prepare plans and specifications in accordance with the criteria of this standard. Describe the specific purposes for applying the practice and the requirements for applying the practice to achieve these purposes.

In the plans and specifications, provide—

- The name of the amendment, the purpose for its use, and the planned outcomes.
- Specifications for the use of the amendment in accordance with the label directions and other instructions provided by the vendor.
- Details of the application methodology, including rates, timing, mixing instructions, temperature requirements, and equipment to be used.
- Required tests to determine the effectiveness of the amendment as appropriate.

OPERATION AND MAINTENANCE

Develop and review a site-specific operation and maintenance plan with the operator prior to implementation of the practice. At a minimum include—

- Safety considerations, label directions, and other instructions provided by the product supplier.
- Details of amendment to be used, application rates and timing, and equipment to be used.
- Safety precautions necessary when handling the amendments to be used.
- Recordkeeping guidance to document application rates and timing; and testing to improve manure treatment processes; and for verification of implementation.

REFERENCES

Moore, P.A., Jr., T.C. Daniel, D.R. Edwards, and D.M. Miller. 1996. Evaluation of Chemical Amendments to Reduce Ammonia Volatilization from Poultry Litter. *Poultry Science* 75:315-320.

Moore, P.A., Jr., T.C. Daniel, and D.R. Edwards. 1999. Reducing Phosphorus Runoff and Improving Poultry Production with Alum. *Poultry Science* 78:692-698.