COMPREHENSIVE NUTRIENT MANAGEMENT PLAN FROM A USDA PERSPECTIVE

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Abstract

Livestock manure has emerged over the past few years as a major political, as well as an environmental issue. As the Congressional Research Service described the situation in a May 1998 report: "Social and political pressure to address the environmental impacts of livestock production has grown to the point that many policy-makers today are asking what to do, not whether to do something." It added: "The bulk of current policy debate on animal waste issues, both legislative and regulatory, is occurring in states, and that activity is vigorous and multi-faceted. Federal attention followed more recently."

National policy attention had reached a peak over the last few years, as symbolized by the issuance of the USDA/EPA Unified National Strategy on Animal Feeding Operations. Below the national level, no less than 34 states have passed, voted on, or at least debated policies in the last five years that would directly or indirectly affect control of livestock manure. Numerous counties have passed their own ordinances relative to the matter. Finally, in the non-governmental realm, some of the national livestock producer groups have undertaken their own initiatives during the past two years to curb manure runoff and related environmental problems.

Market forces, technological changes, state and local regulations, and industry adaptations have produced unprecedented increases, concentrations, and geographic shifts in confined livestock production in the United States. Public perception of the impacts that this concentration of livestock may have on the environment is based on the Pfiesteria outbreaks along the mid-atlantic; urban water supplies contaminated by Giardia, Cryptosporidium parvum, and nutrients; and increased in-stream nutrient, pathogen, and organic loading correlated with livestock numbers. Two issues of growing concern are: 1) non-point source pollution of the Nation's water from AFOs, and 2) the inadequacy of traditional land-based manure nutrient management strategies as livestock operations surpass the carrying capacity of the land in some geographic areas.

Introduction

"Technical Guidance for Developing Comprehensive Nutrient Plans" is a document intended for use by the Natural Resources Conservation Service (NRCS) and conservation partner state and local field staffs, private consultants, landowners/operators, and others that will be developing or assisting in the development of the comprehensive nutrient plans (CNMPs). This technical guidance is not intended as a sole source of reference for developing CNMPS. Rather, it is to be used as a tool in the process of providing technical assistance in identifying the conservation practices and management activities that will be included in a CNMP.

A Comprehensive Nutrient Management Plan (CNMP) is a component of a conservation plan that is unique to animal feeding operations. A CNMP is a grouping of conservation practices and management activities which, when combined into a system, will help to ensure that both production and natural resource goals are achieved. It incorporates practices to fully utilize animal manure and organic by-products as a beneficial resource. A CNMF addresses natural resource concerns dealing with nutrient and organic by-products and their adverse impacts on water quality. A CNMP needs to be in compliance with all applicable local, tribal, State, and Federal regulations. For certain unique, impacted watersheds or water bodies, special management activities or conservation practices may be incorporated to meet specific local, tribal, State, or Federal regulations.

The conservation practices and management activities in a CNMP for which NRCS maintains technical standards are to meet these standards. Components of a CNMP for which NRCS does not currently maintain standards are to meet criteria established by local, tribal, State, Federal government or others recognized by NRCS. Ultimately, it is the producer's responsibility as the decision-maker to select the system of conservation practices and management activities that best meet their needs from the alternatives available.

The goal of a CNMP as described in the Unified National Strategy for animal feeding operations (AFOs) is to minimize the adverse impacts of (AFOs) on water quality and public health. To accomplish this goal will require a significant increase in the intensity and comprehensiveness of technical assistance provided to producers.

Potential Workload

The work load analysis (WLA) conducted by Natural Resources Conservation Service and the conservation partnership shows that there are about 1.4 million animal feeding operations with 0.1 of an animal unit or greater base on the 1997 Census of Agriculture. Of this universe of 1.4 million, it is estimated that 298,500 would need technical assistance, to develop CNMPs. There are slightly more than 500,000 operations with goats, horses, sheep, mules and rabbits included in the 1.4 million universe.

A CNMP is to be developed by the client for the client's use to record decisions for production, natural resource protection, conservation, and enhancement.

Decision and resource information needed during implementation and maintenance of the plan are recorded. The narrative and supporting documents provide guidance for implementation and may serve as a basis for compliance with state, tribal, and federal regulations.

A CNMP is to include all land units, on which manure and organic by-products will be generated, handled, or applied, that the client either owns or has decision-making authority over.

ELEMENTS TO CONSIDER WHEN DEVELOPING A COMPREHENSIVE NUTRIENT MANAGEMENT PLAN -

1. Animal Outputs - Manure and Wastewater Collection, Handling, Storage and Treatment, and Transfer

A manure and wastewater management system for a given animal feeding operation (AFO) should include all the components and management activities necessary to minimize degradation of water quality. A system may consist of a single component or as many components as necessary to meet the objectives of the owner/operator while minimizing the environmental impacts. An on-site visit is required to identify existing and potential resource concerns, problems, and opportunities in the siting of manure and wastewater management system components. It is also important during this site visit to document the existing in-place infrastructure, equipment available, and transfer processes being used.

2. Evaluation and Treatment of Sites Proposed for Land Application

An on-site visit is required to identify existing and potential resource concerns, problems, and opportunities for the conservation management unit (CMU). This process will be used to identify and assess operations and activities needed to address existing and potential natural resource problems. .

3. Land Application

The potential long and short-term impacts of planned land application of all nutrients and organic by-products (e.g., animal manure, waste water, commercial fertilizers, crop residues, legume credits, irrigation water, etc.) must be evaluated and documented for each Conservation Management Unit (CMU).

4. Record of CNMP Implementation

If the landowner/operator is to adequately apply and assess their CNMP, it is critical that they maintain a record of their activities and the functionality of the system. A record keeping plan should be developed that addresses key elements of the CNMP to aid in the application and assessment documentation.

5. Inputs to Animals - Feed Management

Feed management activities may be used to reduce the nutrient content of manure making it easier to manage in a land application scenario. These activities may include phase feeding, amino arid supplemented low crude protein diets, and the use of low phosphorus grain and enzymes such as phytase or other additives. When used, feed management activities shall be in accordance with recommendations by Land Grant Universities, Industry, and others recognized by NRCS.

6. Other Utilization Activities

Using manure and organic by-products to provide for alternative, environmentally safe, uses and solutions should be an integral part of the overall CNMP. This is especially true where past land application of manure and organic by-products are a problem because of residual soil nutrient content, and future land application will make conditions worse.

Summary

In 1998, NRCS conducted a study titled "Nutrients Available from Livestock Manure Relative to Crop Growth Requirements". Using farm-level data from the 1992 Agriculture Census, the authors presented county estimates of pounds of manure nitrogen and phosphorus potentially generated from confined livestock, and compared these estimates to the potential for nitrogen and phosphorus uptake/removal by crops and application on pasture land. This study indicated that the number of counties where manure nutrients exceed potential plant uptake and removal, including pasture land applications, has increased dramatically since 1949. For instance, the number of counties with excess manure production have the potential to cause water quality problems (nitrogen and phosphorus) more than doubled between 1982 and 1997.

Also, the aggregate effect of odors and gaseous emissions form land application of manure, manure handling, decomposition of dead animals, and, to some extent, from wet feed pose nuisance and public health problems. Current science and technology offer approaches to minimize the problems, but not to entirely eliminate them.

Most of the efforts by USDA and EPA regarding CNMP development have been on land application of manure and organic by-products, To effectively address the manure management concerns, especially in highly concentrated animal areas, other utilization options, such as converting to high-value products need to be a part of the overall management and utilization process.

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