

---

# chapter one

## Introduction

*Mike Daniels, Tom Riley, Melony Wilson, Karl VanDevender, Adrian Baber, Wavy Austin, and Helen Denniston*

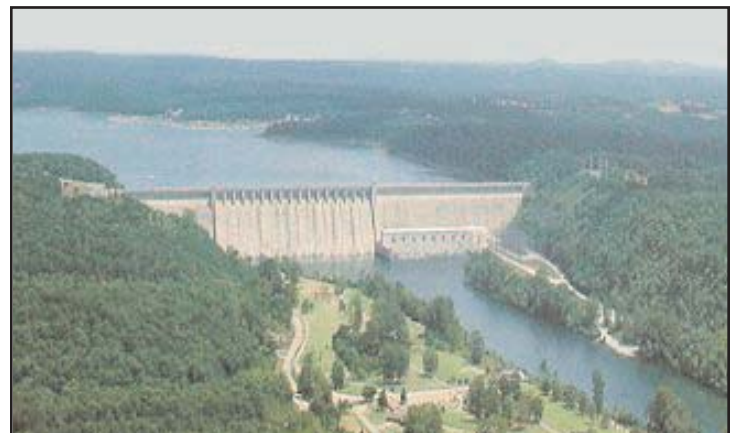
Water quality concerns over the potential of nutrients leaving livestock operations have existed for years. These issues were addressed primarily on a voluntary basis until recently. However, they are now being addressed with both legislative and judiciary approaches. Nutrient management planning has been adopted as a requirement in virtually all the state and federal environmental laws related to confined livestock operations in Arkansas: These include the following:

- Arkansas State Regulation 5 – This law, enacted in 1994, requires all livestock and poultry operations with liquid manure handling systems to obtain a nutrient management plan as partial requirement of receiving a permit for operation. The Arkansas Department of Environmental Quality (ADEQ) has the responsibility of overseeing this law.
- The Federal Animal Feeding Operation (AFO/CAFO) Regulation – This Environmental Protection Agency (EPA) regulation requires all states to permit confined animal feeding operations of a given size (Table 1-1, page 1-2). This regulation has been incorporated into State Regulation 6 and is overseen by the ADEQ. Regulation 6 mandates that permitted CAFOs must implement a nutrient management plan that meets EPA specifications, which are very similar to NRCS's definition of Comprehensive Nutrient Management Plan. (CNMP – See Section below in this chapter).
- Arkansas Acts 1059 and 1061 identify nutrient sensitive areas in the state (Figure 1-1, page 1-3), designates them as Nutrient Surplus Areas, and requires all nutrient applications (whether manure or commercial fertilizer, or agricultural or residential) to be done according to a nutrient management plan or an approved protective use rate. These new laws will be carried forth by the Arkansas Soil and Water Conservation Commission (ASWCC). The ASWCC defines a nutrient management plan as: “a documented

*record of how nutrients will be managed on a nutrient management unit prepared to guide and assist landowners and operators in the use of fertilizers, litter, sewage sludges, compost, and other nutrient sources for maximum soil fertility and protection of the waters within the State.”* On poultry farms with 2,500 birds or more at any given time during a year, the law requires these operations to obtain a poultry litter management plan defined as “the documented plan for use, disposal, and storage of litter by poultry feeding operations.” The poultry litter plans include management of the nutrients within the litter. Act 1059 requires that nutrient management plans in the nutrient surplus areas be written by certified planners. This act also requires that nutrients applied within the nutrient surplus areas be applied by certified nutrient applicators.

There are two other situations in Arkansas that require nutrient management plans, although not by legislation. First, NRCS requires a CNMP for all operations that utilize animal manures as fertilizer for partial eligibility for federal financial incentive programs such as the Environmental Quality Incentives Program (EQIP).

Secondly, as a result of a lawsuit settlement, producers in the Eucha-Spavinaw watershed in Northwest Arkansas (Benton County) must obtain nutrient management plans.

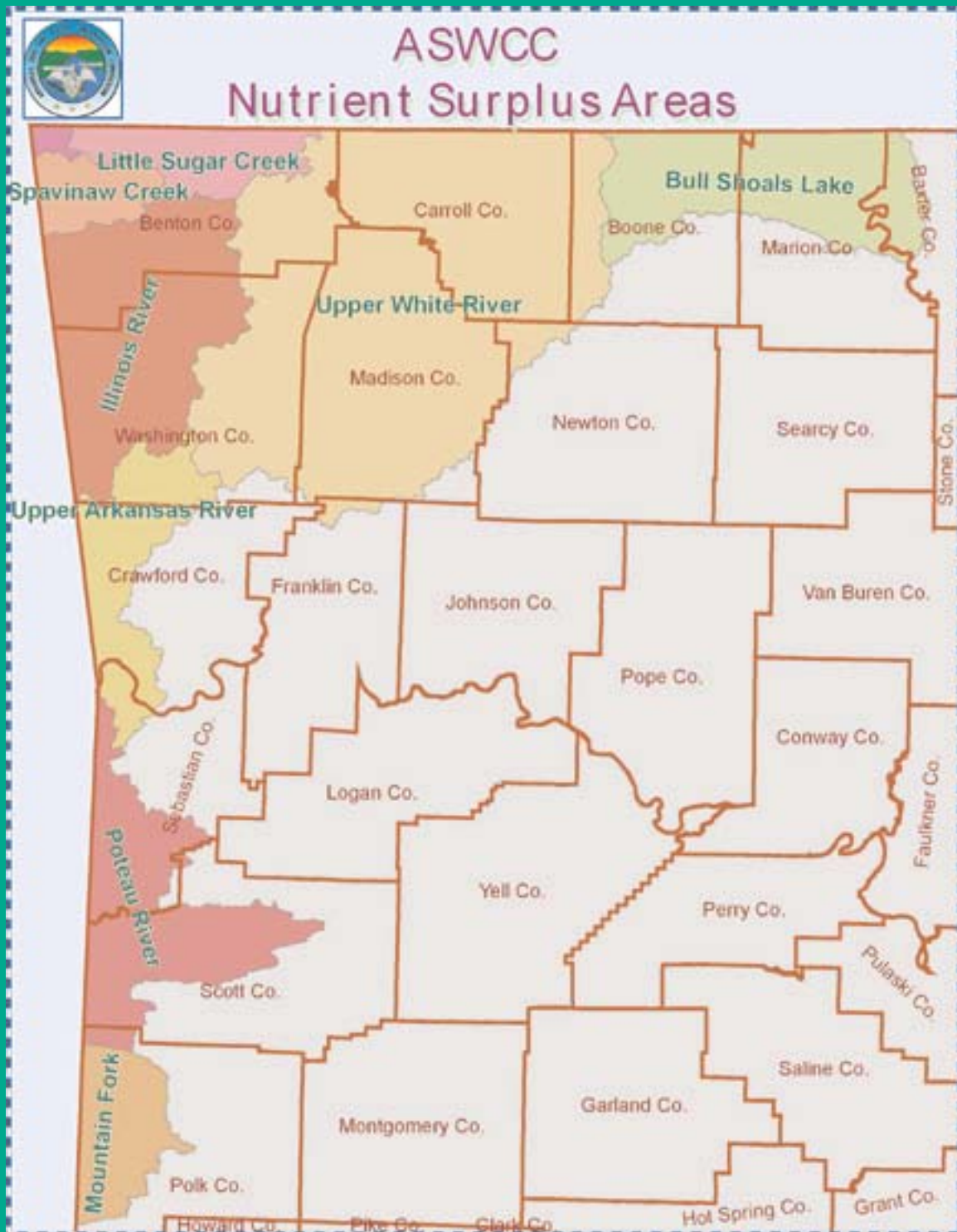


## Introduction

**Table 1-1. Animal requirements necessary for confined livestock operations to be considered a Concentrated Animal Feeding Operation (CAFO). A CAFO is required to obtain a permit from the Arkansas Department of Environmental Quality (ADEQ) to legally operate.**

ANIMAL	NUMBER REQUIREMENTS*
Chickens other than laying hens (operations other than a liquid manure handling system)	At least 125,000 chickens other than laying hens and <b>does not</b> use a liquid manure handling system
Chickens operating with a liquid manure handling system	At least 30,000 chickens and uses a liquid manure handling system
Cattle (other than mature dairy cows) grown in confinement	At least 1,000 cattle, dairy, heifers, cow/calf pairs, or veal calves
Swine (55 pounds or more)	At least 2,500 swine weighing 55 pounds or more
Swine (55 pounds or less)	At least 10,000 swine weighing 55 pounds or less
Horses	At least 500 horses
Sheep or lambs	At least 10,000 sheep or lambs
Turkeys	At least 55,000 turkeys
Laying hens (operations with other than a liquid manure handling system)	At least 82,000 laying hens and <b>does not</b> use a liquid manure handling system
* Confinement must be for 45 days (non-consecutive) for any 12 month period	

Figure 1-1. Nutrient sensitive areas where State Acts 1059 and 1061 apply



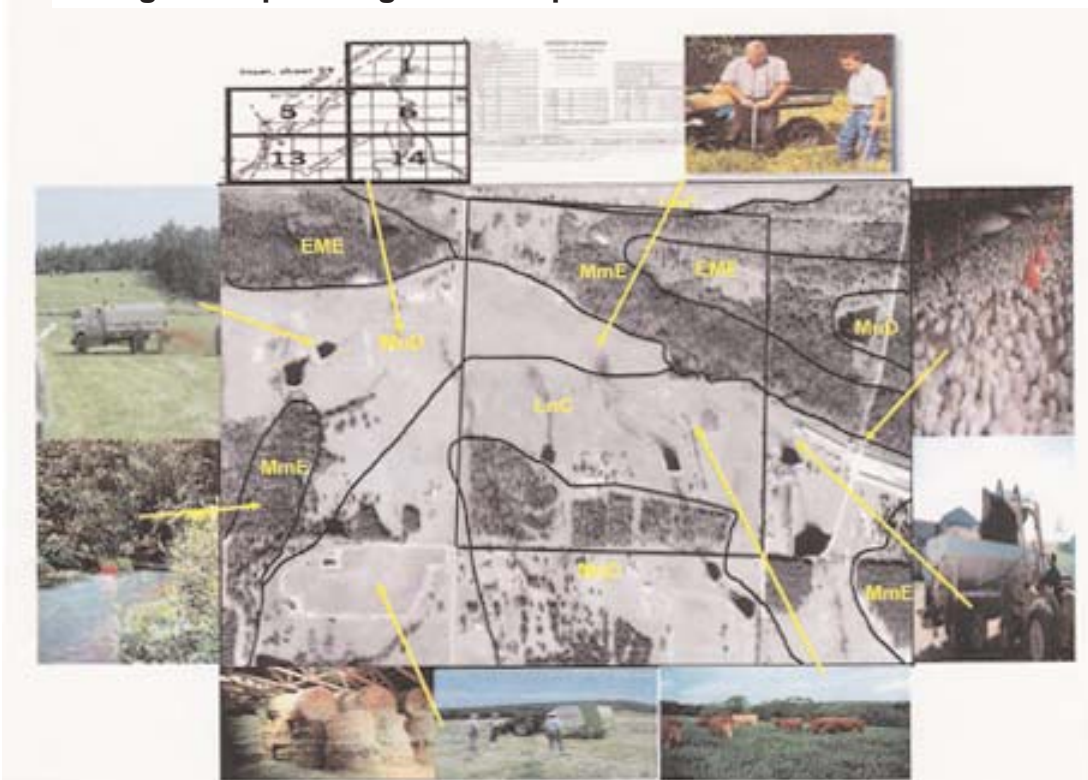
### The Basis for Nutrient Management Planning

Why is nutrient management planning generally recognized as the best approach for minimizing nutrient losses from livestock operations? There are basically two reasons. First, nutrient losses from livestock operations are difficult to control because so many factors affect the fate of nutrients. Many of these factors vary from region to region, from farm to farm, from field to field and within individual fields. Because of this variability in factors, a “one-size fits all” approach to implementing control measures is unwarranted and most likely would be ineffective in resolving nutrient and water quality issues. Nutrient management planning affords the opportunity of a producer working with a professional to tailor practices to the individual needs of a field or farm. In this manner, nutrient management planning is a more flexible and effective control strategy than implementing the same practice across the entire landscape.

Secondly, many livestock farms utilize the nutrients in animal manures produced on farm as a source of nutrients for crops. This practice is common and provides the dual function of providing inexpensive fertilizer and manure disposal. Determining application rates to best meet crop needs without causing off-farm water quality impacts when using animal manure as a fertilizer source can be challenging (Figure 1-2).

Animal manures contain appreciable amounts of nitrogen (N), phosphorus (P), and potassium (K), all essential nutrients for plant growth. Plants require these nutrients in differing amounts. Unlike commercial fertilizers where the N-P-K ratio can be easily tailored to meet the crop needs, the N-P-K ratio in manures is not easily manipulated and can lead to over application of some nutrients and under application of others depending on the application rate. Secondly, the plant nutrients in commercial fertilizer are readily soluble and available to plants whereas a large proportion of nutrients in manure must

**Figure 1-2. Farming operations that utilize animal manure such as poultry litter as fertilizer for forages should obtain a nutrient management plan to guide their practices.**



undergo transformations dependent on weather, soil and other environmental factors before they are readily soluble and plant available.

This delayed availability of nutrients can be an advantage or disadvantage depending on the timing of the crop's needs for nutrients. The lower solubility of nutrients in manure also means the nutrients are less likely to become soluble in runoff water than nutrients from commercial fertilizers.

These fundamental differences between commercial fertilizer and animal manures exemplify the difficulty in properly managing nutrients derived from animal manure in crop and forage production. This fact has contributed to increased environmental concerns over utilizing animal manures as fertilizer sources. Nutrient management planning is the most accepted practice to ensure that animal manures are properly applied to cropland while receiving as much benefit as possible from the manure.

## Defining Nutrient Management Plans

Because so many different regulations require nutrient management planning, several different variations of nutrient management plans have been developed. However, the Natural Resources Conservation Service (NRCS) Conservation Standard 590: Nutrient Management serves as the “blueprint” for virtually all nutrient management planning efforts (Appendix A) which refers to NRCS Conservation Standard 633: Waste Utilization (Appendix B). The NRCS defines nutrient management as “*managing the amount, source, placement, form and timing of the application of nutrients and soil amendments.*” The NRCS lists the following purposes for nutrient management planning:

- To budget and supply nutrients for plant production.
- To properly utilize manure or organic byproducts as a plant nutrient source.
- To minimize agricultural non-point source pollution of surface and ground water resources.
- To maintain or improve the physical, chemical and biological condition of soil.

Standard 590 provides guidelines for managing the amount, source, placement, form, and timing of nutrients applied to land.

A nutrient management plan is a legal document that guides producers on how nutrients are handled, stored, and applied to meet crop nutrient requirements. It also documents information about the operation and farm as well as what practices have been implemented.

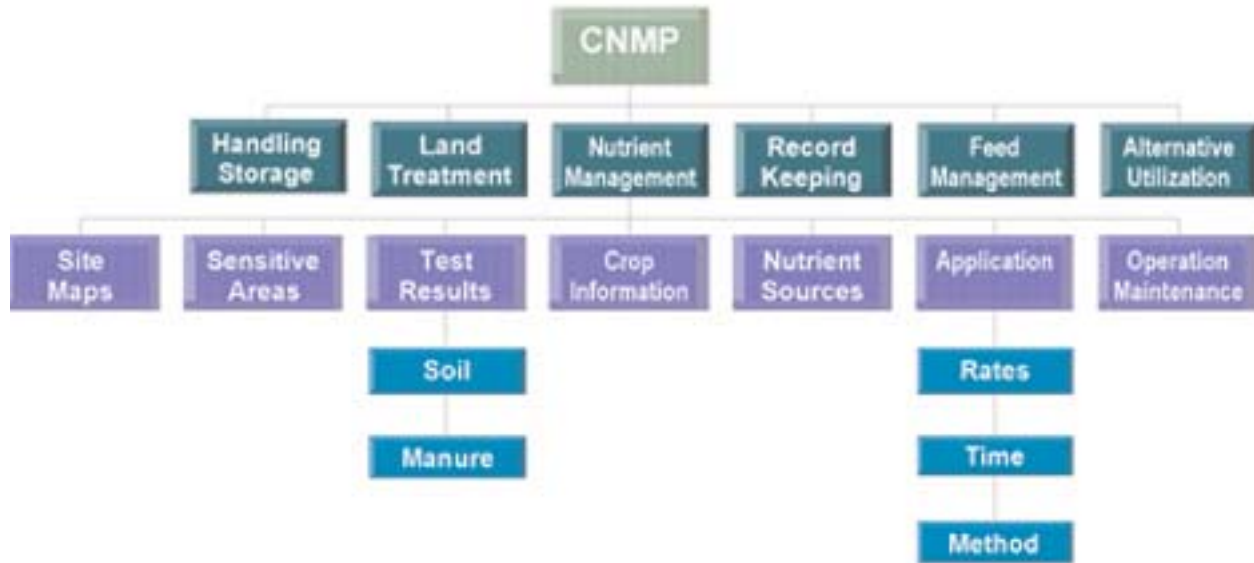
Because nutrient management plans have become legal documents (if required by legislation), plans should be written in a specific format as outlined by the particular regulation and prepared by individuals who have been certified accordingly.

The ASWCC in Title 22, “Rules Governing the Arkansas Soil Nutrient and Poultry Litter Application and Management Program” defines a nutrient management plan as:

*“a documented record of how nutrients will be managed on a Nutrient Management Unit and is prepared in accordance with United States Department of Agriculture Natural Resources Conservation Service conservation practice standards for Arkansas to guide and assist landowners and operators in the use of fertilizers, litter, sewage sludges, compost and other nutrient sources for soil fertility and protection of the waters within the State.*”



Figure 1-3. Components of a Comprehensive Nutrient Management Plan.



Courtesy of Oklahoma State University

Thus, nutrient management plans prepared to help operations comply with Title 22 must adhere to NRCS conservation standard 590 and all other standards referred to in 590.

The ASWCC defines a poultry litter management plan as:

*“a documented plan prepared in accordance with United States Department of Agriculture Natural Resources Conservation Service conservation practice standards for Arkansas for use, disposal, and storage of litter and shall contain sufficient documentation to demonstrate that litter and associated nutrients will be managed in a manner sufficient to protect the waters within the State.”*

A Poultry Litter Management Plan (PLMP) shall address the following major elements: (1) general site information, (2) production information, (3) applicable permits and certifications, (4) Land Application site information, (5) Land Application plans, (6) actual activity records, (7), mortality disposal procedures, and (8) operation and maintenance. The precise content of a Poultry Litter Management Plan will

vary as necessary to meet the needs of the specific Poultry Feeding Operation(s) addressed in the Plan. Again the PLMP must adhere to NRCS conservation standard 590.

The Natural Resources Conservation Services (NRCS) now utilizes Comprehensive Nutrient Management Plans (CNMP) for animal feed operations. A CNMP includes nutrient management as defined above but also utilizes other information such as: land treatment practices, feed management, and other, less routine utilization and storage activities (Figure 1-3). It also considers impacts on other natural resource concerns besides water quality including wildlife habitat, air quality, and soil quality. A CNMP must be developed by NRCS or those certified private technical service providers with appropriate NRCS certification. State certification under Title 20 does not make one certified by NRCS to develop CNMPs. The nutrient management component of a CNMP and that required by the State (ASWCC) are identical. Thus, once the nutrient management plan is developed for the State regulations, it can be incorporated into a CNMP, but cannot be substituted as a CNMP.

Under State Regulation 6, the ADEQ requires a Manure Management Plan that differs in name only from the nutrient management portion of a CNMP and ASWCC's definition of a nutrient management plan. In the Eucha-Spavinaw watershed in western Benton County, a CNMP is required, however, a different planning process is used as mandated by a Federal Judge in a lawsuit settlement.

### What Are the Legal Implications of a Nutrient Management Plan?

If a nutrient management plan is required by law or a permit, it becomes a legal document that specifies how nutrients will be utilized. For the producer, it is critical that records are kept to document the implementation of a plan. Ideally the records will document that the plan is followed. In this case, crop production needs and environmental concerns are addressed while the plan and records provide legal protection. If the plan is not properly implemented, the records will either document the plan was not followed or that the records were falsified to indicate compliance to the plan. In both of these cases, there are significant financial and legal risks.

In the case of the planner, he or she must develop a plan that complies with the regulations that require the plan. If the planner fails to do this, he or she is assuming financial and legal risks.

In summary, this manual has been developed to help state-certified planners comply with State Title 22

regulations for developing poultry litter management plans. Since the basic principles are the same, it can also be used to develop nutrient management plans for those situations where poultry litter is not utilized.

### Selected References

Daniels, M.B., T. Daniel, D. Carman, R. Morgan, J. Langston, and K. VanDevender. *Soil Phosphorus Levels: Concerns and Recommendations*. 1999. Univ. of Arkansas Coop. Ext. Service Fact Sheet #FSA1029-4M-6-98-N.

Daniels, M.B., K. VanDevender, and T. Riley. *Nutrient Management Planning for Livestock Operations: An Overview*. 2004. Univ. of Arkansas Coop. Ext. Service Fact Sheet #FSA9515-1.5M-5-04N.

Goodwin, H.L., F.T. Jones, S.E. Watkins, and J.S. Hipp. 2003. *New Arkansas Laws Regulate Use and Management of Poultry Litter and Other Nutrients*. The Univ. of Arkansas Coop. Ext. Service Fact Sheet #FSA29-5M-9-03N.

United States Environmental Protection Agency. *Producers' Compliance Guide for CAFOs*. November 2003. EPA 821-R-03-010.

United States Department of Agriculture. *The Natural Resources Conservation Service Conservation Standard 590: Nutrient Management*.

