

Topic: What is the definition of a nutrient management plan?

Specific EPA Questions:

- *“...the Agency is considering the use of a model or template for identification of the terms of the NMP. The Agency solicits comment on these various approaches to identify the terms of the NMP that would be included in the permit.” (FR pg. 37754).*
- *“EPA solicits comment on the degree of flexibility that should be allowed in NMPs.” (FR pg. 37755).*
- *“EPA is also interested in taking comment on an approach that might allow greater flexibility for CAFO operators in making cropping decisions while assuring permitting authorities and the public that they are complying substantively with the terms of the NMP as incorporated into the permit, even if the CAFO modifies its practices somewhat from those articulated in the NMP and the permit.” (FR pg. 37757).*

Our Concern:

We are concerned that the guidance EPA is providing on nutrient management plans is likely to result in inflexible documents that are fundamentally different than the strategic planning documents now used by farmers.

Our Recommendation:

We recommend that EPA abstain from providing guidance on the following:

1. The definition of a nutrient management plan.
2. The mechanism to incorporate a nutrient management plan into the general permit.
3. Defining what constitutes a significant change in a nutrient management plan.
4. The role of public comment on the nutrient management plan.
5. Template nutrient management plans.

Instead EPA should give the states responsibility to define effective nutrient management planning strategies that meet the diversity of conditions among states.

If EPA insists on providing guidance defining a nutrient management plan and a significant change in a nutrient management plan, define the plan as the collection of decision making tools and standards used to determine the suitability of fields to receive manure and the rates and timing of applications. The definition or “significant changes” should be limited to an intent to change the approach used to determine specific dates and rates of manure application. Avoid defining the nutrient management plan as the dates and rates of application.

Comment:

At the heart of this debate is what defines the “terms” of the nutrient management plan required by the 2nd Circuit court to be included in the NPDES permit issued to a CAFO.

These comments support the concept that the terms of the nutrient management plan that must be incorporated into the NPDES permit are the underlying calculations and sampling procedures that allow the operation to determine appropriate rates of manure application on a field. These comments strongly assert the terms of the nutrient management plan are not the specific dates and rates of application on a specific field.

To determine a rate and quantity of manure application on a field the following field-specific information is needed:

- Method of manure application
- Setback requirements for the field
- Results of the phosphorus loss assessment
- Soil test results
- Crop rotation including field-specific yield goals
- Manure test results
- Estimate of nutrient availability

To determine the timing of the application also requires knowing soil moisture and the weather forecast at the time of application. These are unknowable years in advance.

A nutrient management plan typically forecasts nutrient management activities for five years. The more years you follow a plan the greater the expectation that planned rates and dates of application for a specific field will be different than what should be applied to the field. As we progress through the plan to year five we have access to much better information for determining a manure application in the fifth year of the plan than we did at the time the plan was first created. For example, the rate of manure application should be adjusted for manure tests that will be taken during the first years of the plan. Many plans will include soil sampling during the plan that will change fertilizer recommendation for the field likely changing the manure application rate. The phosphorus loss assessment in many states varies with soil test results and planned manure application rate so the assessment results may be different by the time manure is to be applied five years into the plan. Possible changes in crop sequence in the first years of the plan may force changes in the optimum rate of application by affecting fertilizer recommendations, method of manure application and manure application setbacks.

There are good reasons for changing dates and rates of manure application years, months or even days after the completion of a nutrient management plan. Weather conditions unforeseeable at the time of writing a plan can close a manure application opportunity potentially forcing planned applications off particular fields. Examples include imminent heavy rains and frozen or saturated ground.

A nutrient management plan is built on an estimated volume of manure. Manure volume estimates in the planning process typically represent an average value for what is expected to be generated each year. The planned annual volume of manure typically does not vary from year to year in most plans. Actual volumes of manure can substantially vary year-to-year, particularly in open storages. Most people reasonably do not consider the estimated volume of manure a term of the nutrient management plan; operations should not be cited for failure to meet the terms of the nutrient management plan if manure volume increases by 30% in a wet year or decreases by 30% in a dry year. Other specifics of the plan such as the manure test result, specific

crop on a field, rate of application and time of application similarly cannot be viewed as static terms of the plan.

The true “terms” of nutrient management plan is the system used to determine the actual rate of application. Terms would include:

- The protocol used to sample manure storages and use the resulting samples to estimate manure nutrient concentration.
- The soil sampling strategy for fields receiving manure.
- A source or method for estimating yield goals on fields receiving manure.
- The source of the fertilizer recommendations.
- The phosphorus loss assessment strategy including the interpretation of the results.
- The types of calculations that will be used to determine nutrient availability in the manure.
- The system used to determine manure application setback on fields receiving manure.
- The tactical procedures to insure soil moisture and weather conditions at the time of application are appropriate.

On a fundamental level the nutrient management plan is *how* you determine the rates and dates of manure application. The specific rates and dates provided in an initial five-year plan is a “feasibility study” of your proposed approach. Record keeping *proves* you properly applied the rules of your nutrient management plan when calculating the actual rates applied to a field.

Unfortunately, the preamble to the proposed rule provides a cloudy picture of what EPA wants the states to implement as the terms of the nutrient management plan. In some places the preamble seems to endorse our perspective that the terms of the nutrient management plan is strategic document on *how* rates are calculated. For example, at one point EPA states “*Nutrient management plans are dynamic documents and are developed to accommodate routine variations, for example changes resulting from*

anticipated crop rotation or climatic variability inherent in agricultural operations, as well as changes in numbers of animals and volume of manure, litter or process wastewater resulting from normal fluctuations or a facility's planned expansion.” (FR pg. 37755).

These statements seem to endorse the perspective that a nutrient management plan is a strategic document.

There are also ambiguous statements like *“The terms of the NMP would identify site-specific conservation practices to be implemented by the CAFO and establish site-specific requirements for proper land application of manure, litter, and process wastewater, including application rates.” (FR pg.37753).* This statement could be interpreted to require site-specific rates as a component of the nutrient management plan. EPA also states that *“In preparing an NMP, a CAFO would include both the data necessary to determine the application rates in accordance with the applicable technical standards and the calculations it used to determine those rates.” (FR pg. 37754).*

Showing calculations certainly is an important aspect of how rates are calculated. In true nutrient management plan, not all the data necessary to calculate actual rates of application are available during the initial planning process. The requirement that the plan include “the data necessary to determine application rates” is not consistent with recommended nutrient management practices.

Of concern is language where EPA defines elements of a nutrient management plan *“for which a broadly applicable condition in the general permit would not be possible because they are of necessity facility-specific.”* EPA then states *“A prime example of this third category is the requirement for field-specific rates of application.” (FR pg. 37754).* The preamble further clarifies that *“For example, the permitting authority would need to identify the manure, litter, and process wastewater application rates in each CAFO's nutrient management plan on a site-specific basis and incorporate those rates as terms and conditions of the permit before the permitting authority could authorize coverage of the CAFO under the permit.” (FR pg. 37755).*

At another point EPA suggests that a plan will need to be reopened for public comment with “... *the addition of land application areas not previously included in the nutrient management plan. Specific examples of such changes would include changes to the method of land application from injection to surface application, changes in timing from spring to late fall or winter application, and installation of new drainage systems that would increase runoff from land application fields.*” (FR pg. 37756).

EPA also suggests a system where the nutrient management planner predicts the range of possible cropping scenarios for each field and presents in a matrix the all the possible crop-rate combinations. If we are considering a two-crop rotation with two possible methods of application we will have 32 possible scenarios in two years. Even if we reduce these scenarios to a fraction of the total, managing the scenarios, clearly communicating options to the farmer, and properly calculating nutrient balances will become a nightmare, even with the aid of software.

The repeated inclusion of field specific rates as an example of changes requiring public comment demonstrates that EPA has not fully embraced the strategic nature of the nutrient management plan. The nature of nutrient management is that rates of application, selection of crops, method of application and rate of application routinely change during a nutrient management plan cycle. These changes are inevitable due to changing weather conditions, changing business conditions and the results of testing during implementation of the nutrient management plan. Requiring specific information such as soil test results, manure test results and planned rates or application be part of the NPDES permit insures repeated revisions, frequently with public comment, to manage manure on the farm. The pressure on a farmer will be to avoid changes to his or her plan, even when production or water quality goals may recommend change. Avoiding reopening the permit and potential public review will be a strong disincentive to revising or updating a plan, even when valid nutrient management planning goals would recommend such changes.

The most disconcerting measure of EPA's vision of a nutrient management plan is the template plan provided by EPA as a web link (www.regulations.gov under docket # EPA-HQ-OW-2005-0037). EPA states that "*Such a template would help to systematically organize the information necessary to satisfy the NMP requirements in the regulation.*" (FR pg. 37752). The template plan was developed as an example of what could be incorporated into the NPDES permit requirements of a CAFO. The example plan suffers from many limitations and errors:

- The example plan focuses on the data collected at the start of the plan and the rates of application calculated using that data. There is no acknowledgement of or mechanism to incorporate new data into the existing plan.
- The example plan provides no information on the calculations used to determine key elements of the nutrient management plan including manure nutrient availability, fertilizer recommendations, and phosphorus assessment.
- The example plan has many remarkable errors and incomplete requests for information. For example, the manure test results ask for "N" with no appreciation of the form or range of forms that may be needed to calculate availability. Soil test data request is for "N" and "P" (in units of pounds per ton or gallon) with no appreciation for how these elements are incorporated into a nutrient management plan.

We recommend that EPA abstain from providing guidance on the following:

1. The definition of a nutrient management plan, except as a strategic document.
2. The mechanism to incorporate a nutrient management plan into the general permit.
3. Defining what constitutes a significant change in a nutrient management plan.
4. The role of public comment on the nutrient management plan.
5. Template nutrient management plans.

EPA should leave these issues fully up to the states to determine how they are best implemented in their state. Efforts by EPA to establish a national guidance in the preamble demonstrate the pitfalls that befall such efforts while providing simplistic or unworkable approaches to these areas. Such guidance is not needed to insure states understand EPA and the Court's intent in these areas.

If EPA persists in its aspirations to provide guidance on these issues it needs to stringently adhere to a standard that embraces the strategic nature of a nutrient management plan. The key to success is a standard where:

1. The plan tells you how a farmer will evaluate suitability of a field for manure application and calculate a rate on any field they intend to apply on;
2. An example is provided demonstrating the feasibility of the approach;
3. Record keeping requirements document the farmer is meeting the goals of the plan.

There are also references that can be adopted to communicate how a farmer will put together a nutrient management plan. We agree that the NRCS nutrient management standard provides excellent guidance on many aspects of developing a nutrient management plan. We also endorse states approving the use of specialized nutrient management software to help implement and communicate how a nutrient management plan is developed on a farm.

EPA provided detailed guidance defining a significant change to a nutrient management plan that would require review by the permitting authority and possibly public review. In this section EPA provides a mixed message on its interpretation of a nutrient management planning process. EPA details a very workable approach to changes in a nutrient management plan near the end of the section of the proposed rule:

“EPA is also interested in taking comment on an approach that might allow greater flexibility for CAFO operators in making cropping decisions while assuring permitting authorities and the public that they are complying substantively with the terms of the

NMP as incorporated into the permit, even if the CAFO modifies its practices somewhat from those articulated in the NMP and the permit. Under this approach, the Agency would modify the annual report requirements for permitted CAFOs in 40 CFR 122.42(e)(4) to require all CAFOs to submit information with the annual report indicating how the CAFO achieved substantive compliance with the terms of the NMP as set forth in the permit. If the CAFO implemented any cropping options not included in the calculations provided in the NMP, the CAFO would document the procedures and nutrient management practices utilized, including crops grown and fields planted, together with nutrient management calculations that governed its land application practices for the prior calendar year, and explain how the modified cropping options as implemented continued to comply with the substantive terms of the NMP incorporated into the permit.” (FR, pg. 37757).

This approach exactly articulates our suggested approach to nutrient management planning. Operations have a strategy defined in the nutrient management plan to cope with expected and unforeseen circumstances and they use record keeping provisions of the rule to demonstrate successful implementation of nutrient management criteria. From our perspective, this is all the guidance that is needed on nutrient management planning.

Unfortunately, EPA goes on to say *“Under this option, EPA would include guidance in either rule or preamble text on which types of deviations from the NMP would be allowed, and what would be required to demonstrate in the annual report that these deviations substantively complied with the permit terms.” (FR, pg. 37757).* Terms that were considered earlier in this section will unnecessarily promote extensive review and re-opening of permits and in some cases discourage activities we recommend producers pursue to protect water quality.

For example one criterion for review is *“An increase in the rate of nutrients from manure, litter, or process wastewater applied to the land application area that is significant in relation to technical standards established by the Director.” (FR, pg*

37756). The focus of this restriction is on the quantity of manure the operation generates. If the quantity is greater than what was in the plan then the plan and the permit needs to be re-opened. This restriction is independent of any change in animal numbers. Operations, particularly ones with open storages, have significant variations in manure volume. A year when manure volume increases should not be a concern if the operation has a nutrient management plan that details the strategies that will be used to determine application rates on any new fields needed for manure application.

The next point defines a significant change as a change in the nutrient balance:

“(i) An increase in the ratio of animals, manure, litter, or process wastewater to the available land application acreage or storage capacity; (ii) changes in the CAFO’s procedures for handling, storage, treatment, or land application of manure, litter, or process wastewater; (iii) a significant increase in the number of animals; or (iv) a significant reduction of manure, litter, or process wastewater hauled off site when there is no equivalent decrease in the amount of manure, litter, or process wastewater produced.” (FR, pg 37756).

Changes in animal numbers (iii) need not be addressed here because other terms of the permit more clearly dictate the need for updating a permit based on changing animal numbers. Points (ii) and (iv) could frequently be invoked. For example point (ii) could be invoked if an operation moved from injection to surface application of manure. Again these approaches miss the underlying basis for nutrient management planning. EPA should not be focused on a plan details every eventuality in terms of the planned locations of manure application. EPA should instead be focused on insuring that the mechanisms are in place that wherever the operation applies manure it is applying the correct strategic approach to nutrient management. The approach embodied in points (ii) and (iv) erroneously focus on the wrong aspect of the nutrient management plan.

Finally, criterion (4) states that a permit would need to be opened with *“the addition of land application areas not previously included in the nutrient management plan.” (FR, pg 37756).* Typically, we encourage operations to expand the acres available for

manure application whenever possible. Operations will not endeavor to expand their land base after they get a permit if it will require re-opening their permit and the associated public review. This requirement again, falsely defines the nutrient management plan as the specific fields and associated rates, not the approach used to identify appropriate fields and appropriate rates.

We recommend EPA adopt the strategy discussed on pg. 37757 of the FR that defines a mechanism for operations to modify a nutrient management plan without re-opening their permit. We further recommend that EPA not provide guidance on situations when it is appropriate to use this approach, leaving it up to the states to implement the rule.

Public notification to implement or change a NMP is the primary difference between implementation of a NMP on a permitted operation and an unpermitted operation. An operation that fully implements an NMP will have met most permitting requirements except the public comment provisions. Adoption of workable standards for public comment on a strategic NMP is the key to encouraging more operations to voluntarily obtain a permit, an activity we endorse.

Table 1 outlines appropriate and inappropriate integration of selected potential elements of a nutrient management plan.

Table 1. Examples of nutrient management topics and appropriate and inappropriate implementation in a nutrient management plan.

Topic	Appropriate implementation	Inappropriate implementation
Field nutrient balance	A five year nutrient balance will be calculated on all fields receiving manure. On fields rated high potential for phosphorus loss, no manure application will exceed the planned five-year phosphorus removal capacity of the field, there will be no applications on fields with more than two years of residual phosphorus in the soil and the total P applied will not exceed the five-year phosphorus removal capacity of the soil.	The nutrient management plan includes a table with the planned phosphorus balance for each field.
Soil testing	Soil tests to assess soil test phosphorus, soil test potassium, soil organic matter, cation exchange capacity, and pH will be taken at least every five years. Sampling will be based on methods in University of Missouri Nutrient Management Guides G9215 and G9217. Fields will be re-sampled before manure application if total phosphorus applied to the field has exceeded the greater of the five-year recommended rate or the five-year removal rate for the field.	A table of soil test results.
Phosphorus assessment	The Missouri phosphorus index or the agronomic approach will be used to assess phosphorus loss from all fields receiving manure that are controlled by the operation. No manure applications will occur on fields rated very high in phosphorus loss assessment. Phosphorus-based management will be required on fields rated high. The assessment must be repeated when new soil test results or substantial changes in management practices such as tillage are likely to affect the assessment of phosphorus loss.	The plan requires reporting the method of phosphorus loss assessment and the results for each field.
Fertilizer recommendations	Fertilizer recommendations will be based on University of Missouri recommendations as calculated in Purdue's Manure Management Planner. Fertilizer recommendations will be updated whenever new soil test results are available.	A table fertilizer requirements for each field.