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Final Regulation Agency Background Document

Agency name	Department of Conservation and Recreation
Virginia Administrative Code (VAC) citation	4 VAC 5-15
Regulation title	Nutrient Management Training and Certification Regulations
Action title	Revise nutrient management plan content and development procedures to enhance nitrogen and phosphorus management provisions in order to protect water quality.
Document preparation date	November 2, 2005

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Orders 21 (2002) and 58 (1999), and the *Virginia Register Form, Style, and Procedure Manual*.

Brief summary

Please provide a brief summary (no more than 2 short paragraphs) of the proposed new regulation, proposed amendments to the existing regulation, or the regulation proposed to be repealed. Alert the reader to all substantive matters or changes. If applicable, generally describe the existing regulation.

The Department of Conservation and Recreation's Nutrient Management Training and Certification Regulations will be amended to include revised criteria for nutrient management plans capable of reducing nitrogen and phosphorus loss from land to ground and surface waters. Modifications to phosphorus management practices are necessary to reduce water quality impacts from the land application of fertilizer, animal manure, sewage sludge, and industrial wastes. Amendments in nitrogen application criteria in nutrient management plans will be primarily addressed through improved timing of land application of nitrogen containing materials.

The key concepts in the proposed final regulations are:

- Provide revised criteria for nutrient management planning for all sources of inorganic and organic nutrients;
- Provide criteria and options for phosphorus based nutrient management planning that will better protect water quality;

- Provide several methods/options for addressing phosphorus applications;
- Provide revised criteria for the timing of nutrient applications that account for differences in environmental risks from various nutrient sources;
- Provide greater protection for environmentally sensitive sites from application of nutrient sources;
- Provide revised criteria based on the best current science available from Virginia Tech and other research sources;
- Provide a revised listing of Virginia soils to include those soil series established since the last regulatory adoption in 1995; and
- Recognize the challenges certain sectors face in complying with these regulations by phasing-in components of the regulations.

The October 2005 version of the Virginia Nutrient Management Standards manual (117 pages), which is incorporated by reference into this final regulation, may be accessed at <http://www.dcr.virginia.gov/docs/StandardsandCriteria.pdf>

Statement of final agency action

Please provide a statement of the final action taken by the agency including (1) the date the action was taken, (2) the name of the agency taking the action, and (3) the title of the regulation.

The Director of the Department of Conservation and Recreation adopted the Department's amendments to the Nutrient Management Training and Certification Regulations (4 VAC 5-15) on November 2, 2005.

Legal basis

Please identify the state and/or federal legal authority to promulgate this proposed regulation, including (1) the most relevant law and/or regulation, including Code of Virginia citation and General Assembly chapter numbers, if applicable, and (2) promulgating entity, i.e., agency, board, or person. Describe the legal authority and the extent to which the authority is mandatory or discretionary.

Several mandates exist for this regulation. § 10.1-104.2 of Chapter 1 of Title 10.1 of the Code of Virginia requires the Department to establish criteria for nutrient management plans. These criteria were last promulgated in the Department's 1995 *Virginia Nutrient Management Standards and Criteria*.

§ 10.1-104.2. Voluntary nutrient management training and certification program. (1994, c. 159.)

A. The Department shall operate a voluntary nutrient management training and certification program to certify the competence of persons preparing nutrient management plans for the purpose of assisting land owners and operators in the management of land application of fertilizers, municipal sewage sludges, animal manures, and other nutrient sources for agronomic benefits and for the protection of the

Commonwealth's ground and surface waters. The Department shall promulgate regulations:

3. Providing for criteria relating to the development of nutrient management plans for various agricultural and urban agronomic practices;...

In addition, Article 3 of Chapter 3.1 of Title 62.1 of the Code of Virginia requires the Department to adopt and implement additional regulatory or other changes to nutrient management plan criteria the Department concludes are appropriate to better address water quality issues associated with poultry waste.

§ 62.1-44.17:1.1. Poultry waste management program. (1999, c. 1.)

C. The program shall include, at a minimum:

2. Provisions requiring that:

a. Nitrogen application rates contained in nutrient management plans developed pursuant to this section shall not exceed crop nutrient needs as determined by the Department of Conservation and Recreation. The application of poultry waste shall be managed to minimize runoff, leaching, and volatilization losses, and reduce adverse water quality impacts from nitrogen;

b. For all nutrient management plans developed pursuant to this section after October 1, 2001, phosphorus application rates shall not exceed the greater of crop nutrient needs or crop nutrient removal, as determined by the Department of Conservation and Recreation. The application of poultry waste shall be managed to minimize runoff and leaching and reduce adverse water quality impacts from phosphorous;

c. By December 31, 2005, the Department of Conservation and Recreation, in consultation with the Department of Environmental Quality, shall (i) complete an examination of current developments in scientific research and technology which shall include a review of land application of poultry waste, soil nutrient retention capacity, and water quality degradation and (ii) adopt and implement regulatory or other changes, if any, to its nutrient management plan program that it concludes are appropriate as a result of this examination; and

d. Notwithstanding subdivision 2 b, upon the effective date of the Department of Conservation and Recreation's revised regulatory criteria and standards governing phosphorous application rates adopted pursuant to subdivision 2 c, or on October 31, 2005, whichever is later, phosphorous application rates for all nutrient management plans developed pursuant to this section shall conform solely to such regulatory criteria and standards adopted by the Department of Conservation and Recreation to protect water quality or to reduce soil concentrations of phosphorous or phosphorous loadings. The application of poultry waste shall be managed to minimize runoff and leaching and reduce adverse water quality impacts from phosphorous.

Regulations promulgated by the Water Control Board in 9 VAC 25-191 and 9 VAC 25-192 requires DCR to begin utilizing more stringent phosphorus criteria for nutrient management plans required for Water Control Board permits for confined animal feeding operations (CAFO) by January 1, 2006. Also, requirements set forth in 40 CFR Parts 9, 122, 123 and 412 as

published in the Federal Register Volume 68, No. 29, dated February 12, 2003 requires states to establish for concentrated animal feeding operations (CAFOs) criteria for nutrient management plans that will be required in NPDES permits. Section 412.4(c) stipulates that CAFOs must develop and implement a nutrient management plan that is based on a field specific assessment, that addresses the form, source, amount, timing, and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen and phosphorus movement to surface waters. Certain provisions of the rule were successfully challenged in a ruling by the United States Court of Appeals for the 2nd circuit in *Waterkeepers Alliance, Inc. et. al. v. EPA* that negated the US EPA rule provision that a large CAFO has a “duty to apply” based on size alone. Certain operations will be required to obtain a NPDES permit in the future if they discharge or intend to discharge wastewater. However, the ruling upheld the nutrient management plan provisions contained in the rule.

Purpose

Please explain the need for the new or amended regulation. Describe the rationale or justification of the proposed regulatory action. Detail the specific reasons it is essential to protect the health, safety or welfare of citizens. Discuss the goals of the proposal and the problems the proposal is intended to solve.

The purpose of this regulatory action is to develop and adopt revised criteria for nutrient management plan content and development procedures. Nutrient management plans are developed in Virginia for a variety of purposes including, as a condition of financial incentives for the implementation of certain best management practices, as a condition for certain animal waste and biosolids application permits, or for voluntary use by land managers. The plans are prepared to manage land application of fertilizers, sewage sludge, manure, and other nutrient sources for agronomic benefits and in ways that protect water quality.

Substance

Please identify and explain the new substantive provisions, the substantive changes to existing sections, or both where appropriate. A more detailed discussion is required under the “All changes made in this regulatory action” section.

Substantive changes are contained in revised 4 VAC 5-15-150 A 2 that pertain to nutrient application rates for phosphorus. The existing regulation states that phosphorus application rates should be managed to reduce adverse water quality impacts. The revised regulation states that phosphorus application rates shall be managed to minimize adverse water quality impacts. The nutrient management planner is given several potential procedures to determine appropriate rates of phosphorus application, but must select a method for use in each instance and adhere to the criteria.

Substantive changes are contained in revised 4 VAC 5-15-150 A 4 that pertain to timing of land applications of nitrogen containing materials. The existing regulation requires nutrient management plans to be developed such that an agronomically feasible crop is planted within 30

days of the application of any nutrient (nitrogen, phosphorus, or potassium) source if no actively growing crop is in place. An exception is allowed that organic nutrient sources may be applied between December 21 and March 16 if necessary and if certain conditions are met. There is scientific evidence that nitrogen from fall and winter applications of poultry manure and other organic nitrogen containing materials can migrate in soils to depths beyond the reach of subsequent crops and potentially contaminate groundwater. The revised regulation requires that such applications be made no more than 30 days prior to crop planting for environmentally sensitive sites and either 60 or 90 days prior to crop planting for other sites depending on the specific type of organic nutrient source used. Provisions are included that allows for additional application time prior to spring planting if fall seeded “trap crops” are used that meet certain performance criteria.

Issues

Please identify the issues associated with the proposed regulatory action, including:

- 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions;*
 - 2) the primary advantages and disadvantages to the agency or the Commonwealth; and*
 - 3) other pertinent matters of interest to the regulated community, government officials, and the public.*
- If there are no disadvantages to the public or the Commonwealth, please indicate.*

Nutrient management plans are prepared for the purpose of assisting land owners and operators in the management of the land application of fertilizers, animal manures, municipal sewage sludges, and other nutrient sources for agronomic benefits and for the protection of the Commonwealth’s ground and surface waters. Nutrient application to land is agronomically necessary in many cases for the economically sustainable production of crops. If applied at excessive rates, at improper times, or if misapplied, nutrients can be lost from the root zone in soils and enter ground and surface waters. Excessive nutrient levels in ground or surface waters used for drinking can be harmful to human health if ingested. Drinking water containing above 10-ppm nitrate-nitrogen is believed to cause methemoglobinemia (blue-baby syndrome - a lack of oxygen transport to the brain) in infants. Excessive nutrient runoff into surface waters can result in algae blooms and depletion of dissolved oxygen, thereby stressing or causing death in fish and other aquatic organisms of commercial, ecological or recreational significance to the Commonwealth. The amended provisions provide increased protections of ground and surface waters, while maintaining efficient crop production techniques that benefits the general public and the farming community. Disadvantages of the amended provisions are certain impacts to livestock and poultry producers, wastewater treatment plant owners, and sludge land application contractors. The disadvantages to these parties are increased costs of disposal where excess quantities of animal waste or sewage sludge exist. The revised phosphorus criteria will result in lower waste application rates per acre on many sites. The revised nitrogen timing amendments will result in increased costs to develop storage for sewage sludge, seasonally landfill sewage sludge when necessary, and/or utilize winter trap crops to manage sludge generated at times of the year when agronomic crops do not utilize nitrogen.

The primary advantage to the Commonwealth is increased protection of ground and surface water quality. Another advantage is the contribution of this action to meeting the Commonwealth’s commitments to reduce nutrient loads to the Chesapeake Bay by 2010 to avoid more stringent requirements proposed by EPA if attainment of water quality standards are not realized.

Changes made since the proposed stage

Please describe all changes made to the text of the proposed regulation since the publication of the proposed stage. For the Registrar’s office, please put an asterisk next to any substantive changes.

Section number	Requirement at proposed stage	What has changed	Rationale for change
4 VAC 5-15-10	Definition of “composted organic nutrient source” include a specific carbon/nitrogen (C/N) ratio.	Removed the specified C/N ratio from the definition.	The specified C/N ratio is more appropriately contained in 4 VAC 5-15-150.
	Definition of “crop nutrients needs.”	Added clarifying language to state quantities per unit area, added phrase “to support growth,” and updated referenced documents.	Clarity and newer referenced publications.
	Definition of “crop nutrient removal.”	Updated referenced documents	Newer referenced publication.
	Definition of “crop rotation.”	Substituted a more practical operational definition for the previous textbook definition.	Clarity.
	Definition of “Environmentally sensitive site”	Strike the word “Soil” and insert the word “Soils”	Clarity.
	Definition of “legume.”	Strike “beans, insert “soybeans.”	Not all beans are legumes.
	Definition of “Mehlich I.”	Clarified definition and cited the reference document.	Clarity.
	None.	Added definition of “Mehlich III.”	Newer soil analysis procedure for phosphorus and other nutrients.
	Definition of “no-till.”	Remove the word “chemical.”	Preceding crops or cover crops can be killed by chemical or other means.
	Definition of “phosphorus index.”	Strike version 1.3, add version 2.0, Revised October 2005.	Newer version cited.
	None.	Added definition for “phosphorus saturation level.”	Comment received requesting that a specific determination method be specified for phosphorus saturation level.
	Definition of “pre-	Modified “nitrogen” to “nitrate”	Technical accuracy.

	sidedress nitrogen test.”	and specified the test was at a specific time during a corn crop growing season.	
	Definition of “residual nutrients.”	Replace the word “baseline” with the phrase “naturally occurring.”	Technical accuracy.
	Definition of “slowly available nitrogen.”	Clarifying language and additional products referenced by example.	Technical accuracy.
	Definition of “soil series.”	Added the word “morphological.”	Technical accuracy.
	Definition of “soil survey.”	Recognized that some soil surveys are now available electronically and provided standards that surveys must meet to be recognized.	Technical accuracy and to preclude entities from developing soil surveys using unsanctioned procedures.
	Definition of “water insoluble nitrogen.”	Struck “urea formaldehyde” from the definition.	Technical accuracy.
4 VAC 5-15-100 C	None.	Added a subsection C. to require that certified nutrient management planners provide the department with a copy of modified nutrient management plans within two weeks following modification of any plan pursuant to relevant sewage sludge, animal waste, or poultry waste permits.	4 VAC 5-15-110 included a provision allowing the department to take disciplinary action if a certified planner failed to provide the department a copy of modified nutrient management plans within two weeks following modification of any plan pursuant to relevant sewage sludge, animal waste, or poultry waste permits. This modification is required for technical accuracy of the regulation, since a companion requirement already existed in proposed 4 VAC 5-15-110 relating to recordkeeping and reporting requirements. The department intends to give certified planners some discretion in modifying existing plans without prior agency approval.
4 VAC 5-15-140 C 1 g	Plan map information.	Added the word “associated” before the word “buffers.” Also added the words “for specific fields” following the words “application rates”	Clarity.
4 VAC 5-15-140 D 9	Soil incorporation times for organic nutrient sources.	Strike “days for” and insert “time of.”	Clarity.
4 VAC 5-15-	Liming recommendations.	Adds the phrase “or to raise soil	Allows lime to be

140 F 5		pH to no more than the upper limit for lime stabilized sewage sludge.”	recommended at soil pH levels slightly higher than optimal pH for crops, but at controlled rates.
4 VAC 5-15-140 F 9	RUSLE 2 erosion documentation.	Eliminates the requirement for the crop rotation to be “specified by calendar year.”	Simplifies the printout of this attachment to a nutrient management plan and reduces the possibility of date conflicts between the nutrient management plan and a soil conservation plan.
4 VAC 5-15-140 G	Additional plan requirements if required by other legislation, regulations or incentive programs.	Clarifies that additional plan requirements need to be incorporated only if the law, regulation, or incentive program has more restrictive requirements.	Clarification.
4 VAC 5-15-150	All references to Virginia Nutrient Management Standards and Criteria, Revised 2005 and Commercial Vegetable Production Recommendations, 2004.	Cites later revisions to documents as Virginia Nutrient Management Standards and Criteria, Revised October 2005 and Commercial Vegetable Production Recommendations, 2005. Changes to the revised Virginia Nutrient Management Standards and Criteria document were made based on public comments and other technical clarifications. These changes included: removal of some poorly drained soil from the “high” risk category of environmental sensitivity, revised phosphorus soil testing conversions for various labs, revised soil pH and lime related tables, changes to phosphorus soil saturation numbers, changes to phosphorus crop removal numbers, revised crop nutrient recommendations for corn grain, corn silage and other crops, changes to specifications for trap crops and cover crops, the addition of several new crops, new recommendations for forested crops and turfgrass, and other technical changes.	The most current versions of the documents cited. Technical changes were made to Virginia Nutrient Management Standards and Criteria based on comments received on the document, in consultation with appropriate Virginia Tech faculty, or where otherwise deemed necessary for technical accuracy.
4 VAC 5-15-150 A 2 c *	Requires nutrient management plans to stipulate that no phosphorus can be applied if soils exceed	Eliminates the 50% phosphorus saturation reduction scheduled for 12/31/2010 and phases in the implementation of the 65% phosphorus saturation limits and	Elimination of the 50% phosphorus saturation limit for phosphorus applications reduces the economic impact to the

	<p>65% phosphorus saturation after 12/31/2005 and 50% after 12/31/2010. Requires that nutrient management plans for organic nutrient sources be developed using phosphorus criteria contained in Nutrient Management Standards and Criteria, Revised 2005.</p>	<p>the zero phosphorus application criteria contained in the Phosphorus Index for certain specified types of existing operations until 12/31/2010. Changes the cited version of Virginia Nutrient Management Standards and Criteria to the October 2005 edition. Fields controlled by existing operations that receive phosphorus applications only from on-farm or on-site generated liquid dairy manure, liquid swine manure, or liquid sewage sludge shall be limited to a maximum of crop removal amounts of applied phosphorus until December 31, 2010 if the field exceeds 65% phosphorus saturation levels or has a phosphorus index rating that exceeds 100. New operations that begin production after December 31, 2005 or operations that expand after December 31, 2005 by increasing the total phosphorus generated in liquid dairy manure, liquid swine manure or liquid sewage sludge by more than 10 percent shall not be considered existing operations.</p>	<p>regulated community. Delayed phase-in implementation of the 65% for certain existing operations with on-site or on-farm generated liquid waste may reduce economic impacts to the regulated community since it provides additional time to develop arrangements for additional land application areas, adopt feed management strategies to reduce phosphorus in manure, or develop alternative uses for manure.</p>
<p>4 VAC 5-15-150 A 2 d</p>	<p>Recommended application rates for secondary nutrients and micronutrients shall be at agronomically or economically justifiable levels for expected crop production.</p>	<p>Changes the “shall” to a “should.”</p>	<p>Planners are not required to address nutrient recommendations for secondary and micronutrients within nutrient management plans.</p>
<p>4 VAC 5-15-150 A 2 e</p>	<p>Allows for the farmer’s past experience with crop yields to make reasonable adjustments to planning yields in lieu of verified yield records provided the upward adjustments impact no more than 20% of the fields on a particular farm and the expected crop yields do not exceed the soil productivity group rating of any soil series that directly adjoins the soils contained in the</p>	<p>Eliminates the phrase “and the expected crop yields do not exceed the soil productivity group rating of any soil series that directly adjoins the soils contained in the specific field as indicated in the soil survey.” Inserts language to require that the 20% limit applies to “acreage of any crop” rather than 20% of the number of fields.</p>	<p>This modification affords planners and farmers more flexibility and discretion in making planning yield adjustments without records, while still addressing the JLARC recommendation (contained in A Review of Nutrient Management Planning in Virginia) to eliminate this provision or limit its applicability. This modification also</p>

	specific field as indicated in the soil survey.		simplifies the requirement as compared to that contained in the proposed regulations.
4 VAC 5-15-150 A 2 f	Soil sampling of fields based on grids of subfield areas may be utilized.	Enables use of subfield grids or management zones for soil sampling.	Provides more flexibility to farmers and planners to make discretionary use of precision agriculture technologies to refine nutrient application.
4 VAC 5-15-150 A 4 b *	Allows organic nutrient sources in nutrient management plans to be applied within 60 days of planting a spring seeded crop to sites that: (i) are not environmentally sensitive sites as identified in 4 VAC 5-15-10 or Virginia Nutrient Management Standards and Criteria, Revised 2005, and (ii) have at least 60 percent uniform ground cover from an existing actively growing crop such as a small grain trap crop or fescue with exposed plant height of three inches or more.	<p>(1) Applications of certain types of materials (poultry manure, swine manure, liquid dairy manure, semi-solid dairy manure with sand bedding, heat treated sludge, liquid sludge and all other organic nutrient sources not listed in (2) below) shall be within 60 days of planting a spring seeded crop to sites that are not environmentally sensitive sites as identified in 4 VAC 5-15-10 or the Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p> <p>(2) Applications of specified types of materials (semi-solid beef manure, semi-solid dairy manure with sawdust bedding or straw bedding, dewatered anaerobically digested sewage sludge, or dewatered lime stabilized sewage sludge) may be within 90 days of planting a spring seeded crop to sites that (a) are not environmentally sensitive sites as identified in 4 VAC 5-15-10 or the Virginia Nutrient Management Standards and Criteria, Revised October 2005, and (b) if slopes of any part of the application area are 7% or greater, the site must have at least 60 percent uniformly distributed crop residue ground cover or the application and ant associated tillage is in conformance with an existing and implemented soil conservation plan meeting NRCS requirements for the site.</p> <p>(3) Adds a new provision allowing</p>	<p>(1) These materials contain significant ammonium form of nitrogen or have a relatively low carbon/nitrogen ratio that results in more rapid transformation of nitrogen to the nitrate form that is most susceptible to loss through runoff or leaching. The 60% ground cover requirement was removed for sites where organic nutrient sources are applied within 60 days of planting.</p> <p>(2) These materials contain relatively little amounts of ammonium nitrogen and/or have a relatively high carbon/nitrogen ratio that results in slower transformation of nitrogen to the nitrate form that is most susceptible to runoff or leaching. The 60% ground cover requirement was removed for sites of less than 7% slope since these flatter fields are less susceptible to runoff.</p> <p>(3) This provision provides additional flexibility to use well</p>

		<p>organic nutrient source application prior to the times specified in (1) and (2) above on:</p> <p>(a) sites that are not environmentally sensitive sites if trap crops exist on the site meeting performance criteria:</p> <p>(i) a trap crop exists that has reached a Zadoks growth stage of 23 or greater having a uniform stand throughout the site area of at least 20 plants per square foot;</p> <p>(ii) the trap crop shall be allowed to continue growing on the entire site until within two weeks of the spring crop planting date;</p> <p>(iii) all such nitrogen applications of organic nutrient sources to cereal trap crops shall not exceed the crop nutrient needs of the upcoming spring planted crop subtracting at least 30 pounds per acre of nitrogen to be reserved for use as a banded starter fertilizer at the time of spring planting;</p> <p>(iv) and the rate of organic nutrient source applied does not smother the trap crop;</p> <p>(b) environmentally sensitive sites as identified in 4 VAC 5-15-10 or the Virginia Nutrient Management Standards and Criteria, Revised October 2005 if conditions in (a) (i) through (iv) above are met and such applications to a trap crop must be within 60 days of planting a spring planted crop.</p>	<p>established trap crops to uptake nitrogen applied in organic nutrient sources during the late fall and winter so that runoff and leaching is reduced. It is important that care be taken not to apply so much material that the trap crop would be smothered. If the trap crop is killed at the proper stage of growth in the spring, nutrients will be released to the spring planted crop. To allow for sufficient immediately available nitrogen at the time of crop emergence of the spring planted crop, it is necessary to withhold at least 30 pounds of nitrogen from the trap crop application to be reserved for a banded starter fertilizer application to be applied when planting the spring crop.</p>
4 VAC 5-15-150 A 4 a and c *	None	<p>Inserts a new provision allowing a delayed implementation schedule for certain application timing requirements contained in 4 VAC 5-15-150 A 4 a and b for sewage sludge applications to non-environmentally sensitive sites. Requires sewage sludge applications in plans to fully comply with 4 VAC 5-15-150 A 4 a and b effective January 1, 2009.</p>	<p>Adequate fall and winter storage capacity is lacking at a number of sewage sludge generation facilities. The implementation delay for contained in this provision will allow the sewage sludge land appliers additional time to develop alternatives such as trap crops, application to evergreen forested land, application to cool season grass hay and pasture, storage, and landfilling.</p>
4 VAC 5-15-	Composted organic	Changes subsection c to	A carbon to nitrogen

<p>150 A 4 c</p>	<p>nutrient sources having a final carbon to nitrogen ratio of 25:1 or greater are exempt from requirements a. and b. of this subsection if analyzed for carbon to nitrogen ratio at the conclusion of the composting process and results are obtained prior to land application. If composted organic nutrient sources are applied greater than 30 days prior to crop planting on sites with less than 60% crop residue cover, the plan shall require chisel plowing or ridge tilling within 48 hours of application of the composted organic nutrient source. If ridge tilling or chisel plowing is utilized, the equipment should be operated predominately along the contour so that uniform parallel ridges are created that will improve soil roughness and reduce runoff potential until any finishing tillage operations are performed close to the time of crop planting.</p>	<p>subsection d and amends the required carbon to nitrogen ratio to 20:1 and eliminates all performance requirements related to residue cover, ridge tillage or chisel plowing.</p>	<p>ratio of at least 20:1 is sufficient to greatly limit the rate of mineralization of organic nitrogen to plant available forms of nitrogen and those forms most susceptible to environmental loss. The crop residue and tillage requirements are unnecessary since these materials can act as a mulch to reduce runoff potential.</p>
<p>4 VAC 5-15-150 A 4 d</p>	<p>Subsection d</p>	<p>Subsection e</p>	<p>Realigns subsection headings to accommodate a previously inserted subsection.</p>
<p>4 VAC 5-15-150 A 4 e</p>	<p>Nutrient applications on frozen or snow covered ground shall not be recommended in nutrient management plans. If an emergency situation such as storage system freeze-up necessitates the application of organic nutrient sources, select fields which have the planner may advise the producer to apply no more than 40 pounds of plant available nitrogen per</p>	<p>The proposed regulation subsection e was struck and replaced by a new subsection f as follows: Nutrient management plans shall include a statement indicating that applications of inorganic nutrient sources, liquid manure, liquid sewage sludge, or liquid industrial waste are not to occur on frozen or snow covered ground. When ground is frozen, dry or semi-solid manures, dewatered sludges, or dewatered industrial wastes may only be applied if the field has: (i) slopes</p>	<p>This change better aligns the regulation with regulatory requirements in the Board of Health's Biosolids Use Regulations and the Water Control Board's Poultry Waste Management Regulations and more clearly describes requirements for nutrient management plan content. It eliminates planner guidance</p>

	acre and deduct the applied nitrogen from other planned applications for the current or next crop if the field has: (i) slopes of less than 6 %; (ii) 60 % uniform ground cover from an existing actively growing crop such as a small grain trap crop or fescue with exposed plant height of three inches or more; (iii) a minimum of a 200 foot vegetated or adequate crop residue buffer between the application area and all surface water courses and; (iv) soils characterized by USDA as “well drained.”	not greater than 6 %; (ii) 60 % uniform ground cover from crop residue or an existing actively growing crop such as a small grain or fescue with exposed plant height of three inches or more; (iii) a minimum of a 200 foot vegetated or adequate crop residue buffer between the application area and all surface water courses and; (iv) soils characterized by USDA as “well drained.”	information about emergency situations.
4 VAC 5-15-150 D 2	The plan shall also state a need for modification if cropping systems, rotations, or fields are changed and phosphorus will be applied at levels greater than crop nutrient needs based on soil analysis as determined from procedures in Virginia Nutrient Management Standards and Criteria, Revised 2005.	Inserts the phrase “prior to subsequent nutrient applications” after the word “modification.” Also, inserts the word “October” after the word “Revised.”	Provides a timeframe for certain plan modifications.
Documents Incorporated by Reference	N/A	Cites later revisions to documents as Virginia Nutrient Management Standards and Criteria, Revised October 2005 and Commercial Vegetable Production Recommendations, 2005. Amends reference to Virginia Phosphorus Index Technical Guide to version 2.0. Adds a new reference: Reference Soil and Media Diagnostic Procedures for the Southern Region of the United States, Southern Cooperative Series Bulletin No. 374.	Revises dates of referenced documents to more current versions. Adds a document that is referenced in the definition of “Mehlich III.

Public comment

Please summarize all comments received during the public comment period following the publication of the proposed stage, and provide the agency response. If no comment was received, please so indicate.

Public Comment Overview

The Department initiated a sixty-day public comment period on May 2, 2005. During the comment period, four public hearings were conducted. On June 6, 2005, a public hearing was held in James City County at the James City Council Meeting Room. Thirty-three individuals attended and twenty-one of those individuals chose to speak. On June 8, 2005, a public hearing was held in the City of Roanoke at the Roanoke City Council Chambers. Ten individuals attended and four of those individuals chose to speak. On June 9, 2005, a public hearing was held in the City of Fredericksburg at the Fredericksburg City Council Chambers. Seventeen individuals attended and seven of those individuals chose to speak. On June 13, 2005, a final public hearing was held in the City of Harrisonburg at the Harrisonburg City Council Chambers. Eleven individuals attended and all of those individuals spoke.

In addition, to comments received at the public hearing, 142 individuals chose to comment through e-mails, letters, faxes, or through the Virginia Town Hall. The comments received were from a diverse group of stakeholders. Additionally, on September 7, 2005, a meeting with key stakeholders who were actively engaged throughout the process and that represented a wide range of interests was held in consideration of additional changes to the final regulation.

Development Process

1	<p>Commenter: AE, VSA, ESSWCD, Lynwood W. Lewis, POSCWC, CSWCD, VDACS, Roger Jefferson, Tommy Motley, Scott Mundie, Jerald Heatwole</p> <p>Comment: There is inadequate review time allowed for making comments to the regulations and the comment period was at a busy time of year. Greater advance notification times and efforts need to be extended to make all parties and cooperating agencies aware of the proposed action. One commenter indicated that DCR should consider providing the public an additional 60 to 90 days for review and comment on the proposal.</p> <p>Agency Response: No action concerning the regulations. DCR notified all persons on the agency’s public participation mailing list and notified a number of stakeholder groups such as Virginia Farm Bureau, Virginia Poultry Federation, Chesapeake Bay Foundation, and Virginia Agribusiness Council. In addition, all certified nutrient management planners in Virginia were mailed a notice of the public comment period. DCR held four public hearings across Virginia to receive comments and the meetings were well attended. DCR is confident that the agribusiness associations made their membership aware of the public comment period.</p>
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<p>2</p>	<p>Commenter: VSDA, VDACS, VSA, VCGA, VSGA</p> <p>Comment: It appears the advisory committee DCR formed had little or no influence on the agency’s consideration regarding the development of new restrictions on agriculture that would provide flexibility and be least burdensome. The regulations are staff generated and not TAC generated. Some commenters suggested that representatives of every major industry (crop producers, vegetable growers, poultry, turf, dairy, and biosolids waste) has reached out to be included in the process without one group indicating they have had an opportunity to be included.</p> <p>Agency Response: No action concerning the regulations. The technical advisory committee included a broad representation of interest groups. Representatives were invited to represent farmers, soil and water conservation districts, fertilizer dealers, biosolids, poultry integrators, swine integrators, private consultants, nutrient management planners, environmental groups, Virginia Tech, Virginia State University, James Madison University, and other related state and federal agencies. The committee met four times. All meetings were facilitated by the UVA Institute for Environmental Negotiation. Although the committee discussed a number of issues, most attention focused on phosphorus management and nitrogen timing changes. The proposed regulations resulted from a great deal of input from the members of the committee. DCR offered a number of conceptual alternative phosphorus management approaches for discussion and consideration by the group. Some members of the committee clearly felt that the soil test phosphorus management option was the only acceptable means to reduce phosphorus loss from agricultural land, while others felt the only acceptable option was the phosphorus index. The facilitator tested for consensus at several key points. At the final meeting, most members were either supportive of the selected approaches, or stated they could live with the outcome. The final regulations do provide flexibility in allowing farmers and planners to select from several phosphorus management criteria so that they can choose the least burdensome option for each specific situation.</p>
<p>3</p>	<p>Commenter: CBF</p> <p>Comment: We appreciate the efforts of DCR to include a wide variety of stakeholders in all stages of developing these proposed regulations. With representatives from the agricultural and poultry communities, environmental organizations, the biosolids and fertilizer industries, citizen action groups, state universities, and regulatory agencies, all possible stakeholders were represented and encouraged to participate in the TAC. This diverse membership insured that the end product was a collaborative effort and the direct result of compromise and balance between protecting Virginia’s natural resources and Virginia’s agricultural economy. The overall proposed regulations are consistent with the deliberations of the TAC.</p> <p>Agency Response: Agency Response: No action concerning the regulations. DCR concurs.</p>

Economic Impact

<p>4</p>	<p>Commenter: VAC, VPF, Danny Sutton, VSA, FC, TFI, SSC, Sharon S. Quisenberry, Tommy Motley, Lloyd Wright, Jerald Heatwole, AE, VCGA, VSGA</p> <p>Comment: The economic analysis inadequately reflected costs to agribusiness and others of the regulations. The true cost of the impacts is much higher.</p>
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	<p>Agency Response: DCR continues to “generally concur” with the Department of Planning and Budget (DPB) Economic Impact Analysis as was stated in the DCR response to the analysis. In addition, a number of changes to the final regulation will lessen the economic impact on the regulated community. The changes that lessen impact on the regulated community include removing the 50% phosphorus saturation restriction on application and providing more flexibility regarding timing of organic nutrient sources.</p>
5	<p>Commenter: VAC, AE, VSA, VDACS, Recyc, Lynn Gale, Lloyd Wright, Scott Mundie</p> <p>Comment: Many soil samples are analyzed by private labs, so it was not adequate to evaluate potential regulatory impact based on Virginia Tech soil samples.</p> <p>Agency Response: DCR contacted two major private testing labs used by a number of consultants and farmers. The statewide data made available by the largest volume lab was found to be comparable to the Virginia Tech lab aggregate data. This lab is used by a number of sludge land applicators, fertilizer dealers, and farmers. Another lab was found to have samples higher than the Virginia Tech averages, but this lab’s business is heavily weighted toward farms with a history of manure application and/or vegetable production. The highest soil test phosphorus levels indicated by the Virginia Tech data occurred on the two eastern shore counties and in Rockingham County.</p>
6	<p>Commenter: Recyc</p> <p>Comment: The cost to hire a certified consultant to prepare and regularly modify the plan as required was underestimated due to DCR’s disregard for seasonal changes in farm plans.</p> <p>Agency Response: Many nutrient management plans are developed for a three-year period of time. However, farmers want the flexibility to amend the nutrient management plan as circumstances change. It is expected that there are both economic costs and benefits of being able to amend nutrient management plans to best reflect current conditions.</p>
7	<p>Commenter: VPF</p> <p>Comment: The Poultry Waste Management Act has had significant adverse economic effects on poultry farmers. While the net effect of the changed phosphorus criteria will result in more or less litter application of acreage of all poultry farms, but the impact will be negative on some.</p> <p>Agency Response: Page 5 of the Economic Impact Analysis adequately considers this issue.</p>
8	<p>Commenter: VSDA, NB</p> <p>Comment: The cost of purchasing nitrogen and potash to replace nutrients lost by limiting manure applications to phosphorus-based rates was not considered in the economic analysis. Other farmers may lose the use of less expensive and highly beneficial fertilizers, such as biosolids.</p> <p>Agency Response: Page 4 of the Economic Impact Analysis acknowledges that supplemental use of commercial fertilizers may be necessary in these situations. Also, if biosolids are shifted to sites with lower soil phosphorus levels, this will actually provide a greater aggregate economic benefit to agriculture since the farmers receiving the biosolids will benefit economically (via crop response and phosphorus fertilizer cost savings) from the phosphorus contained in biosolids.</p>
9	<p>Commenter: DEQ</p> <p>Comment: DEQ also wishes to emphasize that with respect to the economic analysis provided for this proposed regulation, additional time will be necessary during DEQ inspections to review and ensure compliance of P-based NMPs on all permitted operations.</p>

	<p>Agency Response: DCR concurs, particularly where the phosphorus index is used, compliance evaluations will need to be more detailed and time consuming.</p>
10	<p>Commenter: VAMWA, HRSD, SCWA, PFRWTA, HCDPU, Arlington County Pollution Bureau, BPRC, Recyc, RRSA</p> <p>Comment: The proposed regulations contain an inadequate economic impact analysis. The Department of Planning and Budget estimate of the economic impact of \$500,000 annually on Virginia biosolids generators is wholly inadequate. The South Central Wastewater Authority in Petersburg has estimated its impact to be as much as \$820,000 annually, and Arlington County has estimated their impacts would be approximately \$240,000. HRSD projects the impact on their facility to exceed the \$500,000 statewide estimate. Blue Plains Regional Authority believes their increased costs to be \$2.125 million annually. Because the economic impact of this proposed regulation is substantial, an analysis of whether or not the impact is necessary and attainable must be conducted.</p> <p>Agency Response: DCR initially provided the \$500,000 aggregate estimate. However, the DPB consulted others in developing the analysis and provided specific per unit estimates for additional storage, land filling, and cover crops. The analysis clearly indicates that biosolids suppliers will have to incur additional costs related to storage, land filling, and/or cover crops to comply with the regulation. The economic impact analysis should not include all of the sewage flow into Blue Plains Regional Authority, since a high percentage of this flow does not originate from Virginia localities. It should be noted, however, that much of the Blue Plains sludge is land applied in Virginia.</p>
11	<p>Commenter: Henry J. Staudinger</p> <p>Comment: Since biosolids applicators are already subject to many of DCR’s proposed restrictions, DPB has substantially overestimated costs to biosolids applicators resulting from adoption of the proposed regulations.</p> <p>Agency Response: DCR does believe the timing requirements of this regulatory action will result in increased costs to the biosolids sector. However, DCR concurs that some of the costs, such as those associated with improved phosphorus management, should not be attributed to this regulatory action. A statement contained in the Board of Health’s regulation 12 VAC 5-585-550 appears to limit the amounts of applied phosphorus to “amounts established to support crop growth.” Once soil tests reach Virginia Tech’s designated “high” levels, there is rarely a crop response to additional applied nutrients. At the “high” soil test level, Virginia Tech recommends only maintenance levels of nutrient application, and above the “high” soil test level, no nutrient application is usually recommended. The final DCR regulation is less stringent than this on phosphorus application limits for organic nutrient sources.</p>

12	<p>Commenter: John Kinch</p> <p>Comment: I disagree with the Department of Planning and Budget analysis that states that “Nutrient contamination of surface and ground waters, in turn, has the potential to create serious environmental and health hazards.” The document should not contain this inflammatory language. There are benefits to algae blooms in surface waters because they inhibit aquatic plant growth in shallow areas. This allows newer regrowth to occur in the spring and fall providing a more edible forage for many aquatic creatures. The second “environmental problem” deals more with the supplying of water in municipal systems and the costs associated with dredging. The economic impact statement indicates that land application of manure and biosolids have resulted in phosphorus far in excess of what is required for farming purposes. I have several issues with this statement. Residential developments can have as many as 16 animal units per acre. There are inputs from aging municipal waste delivery systems which are non-point sources as there is no way to check them. Nutrients also come from wild animals and forest leaves that are deposited every fall that contribute significant amounts of phosphorus into or waterways. The analysis should not have use the term “could affect” certain types of farms. They either will affect them or not. Similarly, if it is not expected that significantly more acreage will need to be permitted for the use of biosolids in order to meet the phosphorus requirements, why are these provisions being added to the regulations?</p>
	<p>Agency Response: DCR agrees with the DPB analysis concerning the statement of “potential to create serious environmental and health hazards.” While controlled levels of algae production can have benefits, excessive algae growth and its adverse impact on dissolved oxygen in surface water and reduction in acreage of submerged aquatic vegetation are scientifically supported as negatively impacting the Chesapeake Bay. The agency would also characterize consumption of drinking water greater than the EPA drinking water standard of 10 ppm nitrate-nitrogen as a “health hazard” for infants. A number of studies and monitoring data indicate that unfertilized established forested areas are low contributors of phosphorus to surface waters relative to cropland. It is expected that biosolids land applicators will need to permit different acreage to replace land where phosphorus levels in soils are excessive or loss potential is greatest.</p>

General

13	<p>Commenter: Friends of the North Fork of the Shenandoah, Ron Falyer, Michael T. Cash, Rich Coffman, Ron Evans, Janice Casto, Dave Casto, Pam Richards, Rebecca Leet, John Morland, Thomas E. Lightfoot, Jeff Little, Jack Cook, Charles S. Fama, Bernard Griswold, Mary L. Gessner, Dr. Douglas Lipp, Dennis Jones, Kathy Jones</p> <p>Comment: We support the proposed revisions to the Nutrient Management Training and Certification Regulations.</p> <p>Agency Response. No action concerning the regulations. DCR concurs.</p>
14	<p>Commenter: Lynne Holmes</p> <p>Comment: Do not delay. Act now and adopt these rule revisions! It is critical... to ... minimize pollutants from land applications of manure and sludges. Implementing new phosphate loading requirements and regulating winter applications is an important first step.”</p>

	Agency Response. No action concerning the regulations. DCR concurs.
15	Commenter: SELC, C. W. Williams
	Comment: The recent fish kills in the Shenandoah River, while still under analysis, are cited by the press as caused at least in part by agricultural runoff.
	Agency Response. No action concerning the regulations. The cause of the fish kills is not known with certainty at this time.
16	Commenter: Jay Eiche, Terry Muilenburg, Christopher DeGraw
	Comment: We are concerned with many aspects of nutrient loading as well as bacterial contaminants such as E. coli and fecal coliform that threaten all sources of drinking water. We support the regulation revisions.
	Agency Response. No action concerning the regulations. Although the regulations address nutrient issues only, some of the practices in plans may help reduce pathogen loss to waters as well.
17	Commenter: Jay Eiche
	Comment: I support a reduction in the amounts of manure, poultry litter, and biosolids that can be applied to fields as fertilizer. I support any and all regulations that monitor nutrient levels of the fields as well as the source material being applied. I support any regulatory effort to analyze levels of antibiotics and hormones in livestock feed and subsequent waste.
	Agency Response. No action concerning the regulations. The regulations address nutrient issues only. Issues such as antibiotics and hormones in feed and waste are beyond the scope and authority of these regulations.
18	Commenter: Tom Boyd, Darryl B. Brewer, Maureen Arnold, Jim Tergis, Roseann Tergis, Brian Wiercioch, James R. Arnold, Bruce Ingram, Susie Snell, Frank Cox, Frank Litavec, Harold Allan, L. J. Campbell, Jr.
	Comment: As landowners and recreational users of the Shenandoah Valley and Shenandoah River Watershed, we support the proposed revisions to the nutrient management training and certification regulations. In particular, the regulations affecting the application of poultry litter have support since the poultry industry has proliferated in the area in recent years.
	Agency Response: Agency Response. No action concerning the regulations. DCR concurs.
19	Commenter: Russell Shay, Jeff Kelble, Trace Noel, Peter Pfofenahuer
	Comment: There is a need to manage the nutrient inputs from poultry operations and increased human population in the Shenandoah Valley better than has been done before if the rivers are to remain viable sources of recreation and livelihood. Failure to do so will adversely impact businesses that are dependent on clean water. Some commenters indicated they had been adversely impacted by recent fish kills. Tourism dollars generated by the rivers are multiplied as visitors seek food, lodging and other supplies.
	Agency Response. No action concerning the regulations. DCR generally concurs.
20	Commenter: Lynton Land
	Comment: Why are nutrient management plans not mandated for the land application of manure and poultry litter, which constitute most of the nitrogen pollution?
	Agency Response: No action concerning the regulations. DCR does not have the authority to require nutrient management plans on all lands that receive manure or poultry litter.
21	Commenter: VAMWA, HRSD, SCWA, PFRWTA, HCDPU, Arlington County Pollution Bureau, Synagro

	<p>Comment: The proposed regulations exceed the authority given to DCR by the legislature. The statement of legal basis accompanying the proposed regulation cites §10.1-104.2 of the Code of Virginia as a mandate for this regulation. That statute only provides DCR with the authority to operate a <u>voluntary</u> nutrient management program to certify the competence of persons preparing nutrient management plans. They impose substantive requirements that must be followed and go far beyond a voluntary program that certifies the competence of planners and DCR’s delegated legal authority. The General Assembly has assigned responsibility for developing substantive regulations for the biosolids use program to the Virginia Board of Health. DCR is overstepping its regulatory authority by moving beyond nutrient management <u>training</u> into substantive <u>requirements</u> for land application.</p>
	<p>Agency Response: No action concerning the regulations. In §10.1-104.2 of the Code of Virginia, the agency has not only the authority, but is mandated to promulgate regulations “providing for criteria relating to the development of nutrient management plans for various agricultural and urban agronomic practices.” Proper land application of nutrients contained in sewage sludge is an agronomic practice and a component of nutrient management plans. In §32.1-164.5 of the Code of Virginia, the Board of Health is required to promulgate regulations that shall include “Requirements for site-specific nutrient management plans, which shall be developed by persons certified in accordance with §10.1-104.2 prior to land application for all sites where sewage sludge is land applied ...” While DCR cannot require persons to become certified under §10.1-104.2, the legislature has mandated that all sewage sludge applications impacted by §32.1-164.5 have a nutrient management plan prepared by a certified planner. DCR has the authority to mandate nutrient management plan criteria for plans developed by certified planners. Additionally, Counsel in the Attorney General's Office in a June 2004 memo to the Department's Director, noted that "DCR has authority to require all nutrient management plans developed by persons certified as nutrient management planners under §10.1-104.2 to address both nitrogen and phosphorus". Counsel also stated that nutrient management plans required by the Board of Health "must comply with DCR's criteria. If DCR amends its nutrient management criteria to include phosphorus and other strategies that it finds prudent for effective nutrient management, the resulting DCR criteria would apply to nutrient management plans written to the requirements of the above authorities." [Those authorities noted included CBLAB, VA. Board of Health, and State Water Control Board].</p>
<p>22</p>	<p>Commenter: VSDA, Anthony Beery, HSWCD</p> <p>Comment: Nutrient management plans are too complex and this discourages the use of nutrient management plans. Simplify nutrient management plans so that the farmer’s copy includes a good set of maps, the application summary and balance sheet, and the NMP special conditions. Plan approvals take too long. Certified planners need more leeway in making changes to plans.</p>

	<p>Agency Response: No action concerning the regulations. DCR has looked and will continue to look for ways to simplify nutrient management plans. This has proven to be difficult since various nutrient users are using nutrient sources that have differing characteristics, have differing operational constraints, and differing impacts on water quality depending on site characteristics and management practices. Recipients of nutrient management plans have requested maximum flexibility and also the use of scientific approaches. A simple approach would be to require that all nutrient sources be applied within 30 days of planting on all sites and for all types of materials and to apply based on soil test phosphorus needs. A more complex approach is to justify wider land application window for certain materials provided certain practices are utilized or to allow phosphorus applications to occur based on a site-specific phosphorus index. Certain plan recipients or groups representing plan recipients have requested all of these to be provided concurrently. Concerning plan approval times for regulated operations, most approvals have occurred very rapidly. When problems are found with plans, approval is delayed until the plan is corrected. Following adoption of the regulations, DCR will be providing nutrient management planners with some ability to modify plans they develop for farmers that require permits.</p>
23	<p>Commenter: NRCS</p> <p>Comment: The NutMan computer program printouts should be revised to improve readability.</p> <p>Agency Response: No action concerning the regulations. However, DCR will form a committee of NutMan computer users to develop ways to simplify printouts and improve readability.</p>
24	<p>Commenter: Henry J. Staudinger</p> <p>Comment: DCR must clarify that its proposed regulations deal only with nutrient pollutants.</p> <p>Agency Response: Agency Response: No action concerning the regulations. The regulations, in 4 VAC 5-15-20, state that “A nutrient management plan is prepared to indicate how primary nutrients are to be managed on farm fields and other land for crop production and in ways which protect groundwater and surface water from excessive nutrient enrichment.” DCR believes this provides guidance that the plans and regulations deal directly with nutrients.</p>
25	<p>Commenter: Tony Keen</p> <p>Comment: Virginia nutrient management is stricter than Delaware and Maryland.</p> <p>Agency Response: No action concerning the regulations. Delaware and Maryland both have mandatory requirements for the implementation of nutrient management plans on a majority of their agricultural lands. In Virginia, mandatory nutrient management plans are required by law only in targeted instances, impacting approximately 175 large confined animal feeding operations and 1,100 poultry feeding operations, on sewage sludge application sites, and on state owned lands that receive nutrient applications. This is a small percentage of the land as compared to the land area required to be under implemented nutrient management the plans in Maryland and Delaware.</p>
26	<p>Commenter: Andy Ackley</p> <p>Comment: The legislation is good for fertilizers, but makes it hard on organics. Don’t just look at Virginia Tech recommendations since their recommended rates are too low.</p> <p>Agency Response: No action concerning the regulations. Fertilizer applications are required to meet certain timing and rate conditions in nutrient management plans. Organic nutrient sources that have a wider application window and higher rates of application are allowable for phosphorus. DCR believes Virginia Tech’s recommended rates of application are based on research and provide sufficient nutrient levels to produce realistically achievable yields.</p>

27	<p>Commenter: Recyc</p> <p>Comment: The proposed amendments require persons with greater skills and training, than those of the past, to develop a nutrient management plan. DCR does not have sufficient staff to write the plans for the farmers. DCR has created a need for the farmer to employ outside consultants to develop the plans.</p> <p>Agency Response: No action concerning the regulations. The amendments will require persons with greater skills and training. DCR will revise its training programs. Representatives of the biosolids sector were clear that they desired to be able to use the phosphorus index to determine phosphorus application rates. Much of the additional skills necessary are those required to develop the phosphorus index rating for fields. DCR staff is not sufficient to develop plans for all farmers needing plans. Private planners will need to develop some of the plans.</p>
28	<p>Commenter: Janet Cole</p> <p>Comment: As a farmer who has used bio-solid application, I want the State to impose the most stringent rules necessary to provide adequate protection.</p> <p>Agency Response: No action concerning the regulations. DCR has developed criteria for nutrient management plans that, once nutrient management plans are required by the state Board of Health for all biosolids application sites, will adequately protect water quality from excessive nutrient losses from land application..</p>
29	<p>Commenter: C. L. Ritchie</p> <p>Comment: Do not put these phosphorus rules in place. I depend on biosolids to stay in business due to expensive fertilizer costs.</p> <p>Agency Response: No action concerning the regulations. Biosolids can still be used if applied properly at the appropriate rates and times.</p>
30	<p>Commenter: Scot Lilly</p> <p>Comment: Agriculture bears an unfair share of the corrective burden for nutrient management considering that the majority of nutrients in human waste directly enters surface waters through WWT plants.</p> <p>Agency Response: No action concerning the regulations. Wastewater treatment plants are being required to meet more stringent discharge requirements. Agriculture is a source of water pollutants as well.</p>
31	<p>Commenter: Sharon Quisenberry</p> <p>Comment: Has DCR completed an examination of the current developments in scientific research and technology pertaining to the review of land application of poultry waste, soil nutrient retention capacity, and water quality degradation as required by the Poultry Waste Management Act?</p>

	<p>Agency Response: No action concerning the regulations. The Poultry Waste Management Act does not require a specific report, but rather requires DCR and DEQ, working with the industry, to complete an examination of the issues. DCR used a Technical Advisory Committee to examine these issues and used the entire regulatory process itself in order to conduct the required examination of these issues. DCR also contracted with Virginia Tech to complete a three-year study entitled “Phosphorus Mobility on Agricultural Lands.” As result of this project, Virginia Tech developed a Virginia phosphorus index where the involved faculty recommended limits to phosphorus application and also soil phosphorus saturation levels where no further phosphorus applications should occur. Subsequently, DCR funded a two-year project to evaluate and refine the phosphorus criteria.</p>
32	<p>Commenter: Theresa Long</p> <p>Comment: I want to be able to farm with my father in the future and not be regulated out of business.</p> <p>Agency Response: No action concerning the regulations. This regulatory action does not require any additional farmers to have nutrient management plans.</p>
33	<p>Commenter: Matt Hickmann</p> <p>Comment: These changes place unreasonable burdens on farms. Farmers face many challenges and often must abandon their operations and sell their land. Farming is one of the most effective BMPs available as compared to urban areas such as parking lots. Cancel these regulations so we can keep conserving our environment and producing safe and cheap food.</p> <p>Agency Response: No action concerning the regulations. DCR does not believe the regulations are over burdensome.</p>
34	<p>Commenter: Assoc. of Virginia Potato & Vegetable Growers, Inc.</p> <p>Comment: These regulations have the potential to do harm to our members without sufficient science to prove any real benefits to the Chesapeake Bay. Delay the implementation of these regulations until the Eastern Shore Agricultural Research and Education Center can hire a water quality specialist to generate meaningful scientific data necessary.</p> <p>Agency Response: No action concerning the regulations. The additional data is not necessary for development of these regulations. Eastern shore soils data, Virginia Tech recommendations, and input from staff at the Eastern Shore Agricultural Research and Education Center were used to develop the regulatory criteria.</p>
35	<p>Commenter: Tommy O’Brien</p> <p>Comment: Why continue efforts to eliminate biosolids. There are many benefits to the use of biosolids if they are used correctly.</p> <p>Agency Response: No action concerning the regulations. The regulations are not aimed at eliminating biosolids, but rather the proper use of nutrient sources, including biosolids.</p>
36	<p>Commenter: Beverly Fletcher</p> <p>Comment: Farmers can’t afford to put out too much fertilizer. We must use poultry manure, can’t afford \$250 per ton fertilizers.</p> <p>Agency Response: No action concerning the regulations. Most farms using only fertilizer as a nutrient source are not required to have nutrient management plans. If poultry waste is available free or at little cost, the potential is greater for over application and improperly timed applications to occur.</p>

37	Commenter: John McDonald
	Comment: Poultry growers are regulated, while others can receive poultry litter and apply too much.
	Agency Response: No action concerning the regulations. DCR does not decide which poultry operations are regulated. The State Water Control Board regulations specify which poultry operations are regulated.
38	Commenter: Gerald Garber
	Comment: Ninety percent of the pollution is being caused 10% of the farmers. Farmers with less than 200 cows are not regulated and can do what they want. Agencies know who the bad actors are, let's address the problem. The bad actors are generally not the large farmers that are regulated.
	Agency Response: No action concerning the regulations. DCR cannot require any additional farmers to have nutrient management plans under this regulatory action. Other state laws and regulations require certain farmers to have permits.
39	Commenter: Roy VanderHyde
	Comment: Why is livestock the only industry taking a hit? Fertilizer use is not regulated. Why isn't tobacco covered?
	Agency Response: No action concerning the regulations. DCR cannot require any additional farmers to have nutrient management plans under this regulatory action. Other state laws and regulations require certain farmers to have permits.
40	Commenter: VSA, Bill Henley
	Comment: Urban home use of fertilizers is not regulated, but is a huge consumer of nutrients.
	Agency Response: No action concerning the regulations. DCR cannot require homeowners who use fertilizer to have nutrient management plans under this regulatory action.
41	Commenter: Irvin L. Hoyt, Jr., Tony Rinaldi
	Comment: Golf course superintendents are highly trained and are capable of self regulation with regard to nutrient management.
	Agency Response: No action concerning the regulations. According to a survey of nutrient use on public lands in Virginia conducted by the Virginia Cooperative Extension, golf courses had the highest level of nutrient usage of urban land use categories. The criteria for golf courses has been revised in the final regulation for the highly trained professional to use.
42	Commenter: Ryan Wojtanowski
	Comment: Since when does the pursuit of one person's hobby (golf) justify pollution to the extent that it virtually eliminates the hobby of his neighbor (fishing)? I support the pending revision to the regulations.
	Agency Response: No action concerning the regulations. DCR concurs that the regulations should move forward.
43	Commenter: Steve Glass, Paul J. Hartzell
	Comment: DCR should develop an urban nutrient management certification category.
	Agency Response: No action concerning the regulations. DCR has authority in the regulations to develop an urban certification category and will consider working with the turfgrass industry and Virginia Tech to develop such a category in the future.

44	Commenter: Phillip Hickman
	Comment: Soil samples from homeowner neighborhoods probably test higher in nutrients than farm fields.
	Agency Response: No action concerning the regulations. Nutrients from all land uses, if misapplied, can cause water quality problems.
45	Commenter: John Holmes
	Comment: Land application of sludges, litter and manure can be a beneficial disposal method but the long-term solution will be to gasify these high BTU wastes and make useful electricity. In the meantime, please adopt and enforce the pending regulations.
	Agency Response: No action concerning the regulations. DCR concurs that alternative uses may be a long-term solution. Most energy generation uses of these materials do not reduce the quantity of phosphorus remaining in the residual materials; however, waste volume may be greatly decreased, making transportation and further alternative use of residual nutrients more economical.
46	Commenter: Tyson Foods
	Comment: Tyson Foods is currently investigating alternatives to land application for all its contract growers, and will continue to do so. We urge DCR to continue funding poultry litter programs through cost-share funds and grants.
	Agency Response: No action concerning the regulations. DCR is willing to partner with Tyson Foods and other poultry interests and consider providing matching grants for feasible alternative use projects and litter transport projects if Tyson and the industry are willing partners.
47	Commenter: Daryl Conley
	Comment: If the state could come up with a plan to move some poultry litter from the Shenandoah Valley, it would really loosen the tight situation in the Shenandoah Valley.
	Agency Response: No action concerning the regulations. DCR concurs and has worked in the past to provide matching funds to the poultry industry for alternative projects and a pilot litter transport project. DCR and others, are evaluating several ideas to encourage future poultry litter export from the Shenandoah Valley.
48	Commenter: Richard Rash
	Comment: Nutrient management plans must account for seasons, soil compaction, crop rotations, and timeliness of animal waste applications. Consider promoting crops that remove more phosphorus. Use of scavenger crops should be promoted with cost sharing. Consider cost sharing on lime applications.
	Agency Response: No action concerning the regulations. DCR concurs with the first three points. It is unlikely DCR will cost-share on lime applications since lime typically has significant production benefits that may exceed the water quality benefits.
49	Commenter: Richard Rash
	Comment: Plans must be consistently written, whether done by a private certified planner or a government certified planner. All plans should be written for a three year period, and producers should have the option to amend plans as cropping or waste application needs change.
	Agency Response: No action concerning the regulations. DCR generally concurs.

50	Commenter: Chad May
	Comment: I am supportive of the environment and agree with many of the regulations you have implemented. However, this document contains no sound, science-based information and is full of assumptions. I urge you to take the time to consult with organizations such as Virginia Tech that have a sound background in dealing with the research of these nutrient issues before you move forward with this regulation.
	Agency Response: No action concerning the regulations. The regulations are science based. DCR has consulted heavily with Virginia Tech in establishing the criteria.
51	Commenter: Butch Nottingham
	Comment: The best BMP for the Bay is a healthy oyster population.
	Agency Response: No action concerning the regulations. DCR concurs that a significant oyster population would likely be beneficial for Chesapeake Bay water quality. However, for that to occur, the oysters need to be able to survive. High nutrient levels can lead to low dissolved oxygen which may kill oysters.

Definitions – 4 VAC 5-15-10

52	Commenter: VDH
	Comment: The definition of “cereal crop” should include oats.
	Agency Response: No action concerning the regulations. Oats are a cereal crop, however, the agency chooses not to include oats in this definition since it also relates to the definition of “cover crop” and “trap crop”. While oats are a cereal crop, they are significantly less aggressive in removing nitrogen from soils than are rye, wheat or barley.
53	Commenter: TFI
	Comment: Add a definition for “soil phosphorus saturation” as being the ratio of P to Al + Fe based on the oxalate extraction method, or other methods calibrated to the oxalate method so that future changes in soil test methods continue to accommodate the best estimate possible of soil phosphorus saturation.
	Agency Response: The agency concurs and has added a new definition.
54	Commenter: NRCS
	Comment: Use the term “scavenger crop” instead of “cover crop” in the regulations. Add a definition for “biomass crop” that is grown for the sole purpose of adding organic mater to the soil surface and soil profile.
	Agency Response: No action concerning the regulations. DCR chooses to retain the use of the terms “cover crop” and “trap crop,” rather than add new terms. However, DCR has further specified the criteria related to these two terms in Virginia Nutrient Management Standards and Criteria, Revised October 2005.
55	Commenter: VTCSES
	Comment: “Composted organic nutrient source” should not be defined by its C:N ratio, which is an inappropriate variable for assessing compost quality. Carbon to nitrogen ratios of stable composts typically range from 12:1 to 24:1, but can have a somewhat higher C:N ratio.
	Agency Response: The definition has been amended to address this issue.
56	Commenter: VDH
	Comment: Amend the definition of “composted nutrient source” to be a C/N ration of 20:1.

	Agency Response: The pertinent C/N ration has been reduced from 25:1 to 20:1 in 4 VAC 5-15-150A.4.
57	Commenter: VTCSES
	Comment: “Crop Nutrient Needs” Rewrite to “means the amount of nutrients needed to grow a specified yield of a crop plant per unit area.... Virginia Commercial Production Recommendations for 2004 or the most current version.”
	Agency Response: The definition has been amended to include a per unit area designation. The Commercial Vegetable Production Recommendations have been updated to the 2005 version.
58	Commenter: VTCSES
	Comment: “Crop rotation” is typically employed to minimize pest (i.e., disease, insects, and weeds) problems, not primarily as a method of “maintaining and renewing the fertility of a soil.”
	Agency Response: DCR concurs and has clarified the definition.
59	Commenter: VTCSES
	Comment: “Environmentally sensitive site” – Sinkholes should be included among features of an “environmentally sensitive site” such as highly leachable soils, shallow soils, and others listed as features, rather than having this feature stand on its own as an indicator of such a site. Furthermore, there is no reason to define an environmentally sensitive site solely on the presence of sinkholes, since the bottoms of many sinkholes may contain many feet of soil and actually pose less of an environmental threat than the presence of the other features listed. The potential for water to move through sinkholes directly to groundwater must be accurately assessed before a sinkhole can be considered an environmentally sensitive feature.
	Agency Response: No action concerning the regulations. Land designated as an “environmentally sensitive site” in the regulations is not prohibited from receiving the recommended rate of nutrient applications. The regulations do require the use of more optimal timing procedures for nitrogen applications. In this context, the agency does believe the presence of sinkholes needs to trigger the designation as an “environmentally sensitive site.”
60	Commenter: TFI, VTCSES
	Comment: Require sinkholes to occupy at least 33% of a field area before the field is considered to be “environmentally sensitive.”
	Agency Response: No action concerning the regulations. DCR believes the presence of any number of sinkholes merits the designation as an “environmentally sensitive site.”
61	Commenter: Synagro
	Comment: Revise the definition of “environmentally sensitive site” to read “any field which is particularly susceptible to nutrient loss to groundwater or surface water since it contains sinkholes and/or areas within 50 feet of a sinkhole; or areas of a field containing one or any combination of the following features....”
	Agency Response: No action concerning the regulations. Land designated as an “environmentally sensitive site” in the regulations is not prohibited from receiving the recommended rate of nutrient applications. The regulations do require the use of more optimal timing procedures for nitrogen applications. In this context, the agency does believe that land draining to sinkholes needs to be designated as an “environmentally sensitive site.”

62	<p>Commenter: Synagro</p> <p>Comment: The soil depth of less than 41 inches for a soil to be considered “environmentally sensitive” is arbitrary and not consistent with VDH or NRCS standard definitions. Revise the restriction to read “shallow soils less than 18 inches deep....”</p> <p>Agency Response: No action concerning the regulations. DCR reviewed a number of county soil surveys in western and piedmont Virginia and did not find any to have a listed depth to bedrock with 18 inches on either designated end of the soil depth range. Therefore, the use of 18 inches would appear to be arbitrary. Conversely, many surveys had designated soil depth range endpoints of 40 inches. The department sees no reason to amend the “less than 41 inches deep” criteria for an environmentally sensitive site. The use of this depth also makes the criteria clear and simple for planners since they can rely on soil surveys to make this determination.</p>
63	<p>Commenter: TFI</p> <p>Comment: The definition of “environmentally sensitive site” is too broad; it should be based on distance to surface water and the P-Index.</p> <p>Agency Response: No action concerning the regulations. The use of this term is related more to nitrogen management practices than phosphorus management practices in the regulations. Reliance on distance to surface water and the P-Index would not necessarily address concerns such as nitrate loss to ground water.</p>
64	<p>Commenter: NRCS</p> <p>Comment: Clarify whether a field that is tile drained but does not contain high risk soils is considered an “environmentally sensitive site.”</p> <p>Agency Response: No action concerning the definition of “environmentally sensitive site;” however, this was clarified in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>
65	<p>Commenter: VTCSES</p> <p>Comment: “Legume” – All beans do not efficiently fix atmospheric N. For example, snapbean requires commercial N fertilization. Recommend changing definition of legume to “...plant such as pea, soybean, peanut, clover, and alfalfa, which is capable of fixing nitrogen from atmosphere.”</p> <p>Agency Response: DCR concurs and has modified the definition.</p>
66	<p>Commenter: VTCSES</p> <p>Comment: “Mehlich I”. This definition should be revised to “Mehlich I” or the North Carolina Double-Acid method is a soil analysis procedure used to determine extractable levels of certain nutrient in soils”</p> <p>Agency Response: DCR concurs and has modified the definition.</p>
67	<p>Commenter: VTCSES</p> <p>Comment: We suggest adding the following definition: “Mehlich III” is a modified version of the Mehlich I method and is used to determine extractable levels of certain nutrients in soils”</p> <p>Agency Response: DCR concurs and has added a new definition.</p>
68	<p>Commenter: NRCS</p> <p>Comment: Remove the word “chemical” from the definition of “no-till.”</p> <p>Agency Response: DCR concurs and has modified the definition.</p>

69	Commenter: MSWCD
	Comment: The proposed no-till definition is a good definition and reflects industry and producers definition, but does not match the 60% residue cover requirement of the NRCS definition of no-till. We suggest that a note be placed in the definition that it may not be consistent with NRCS requirements.
	Agency Response: No action concerning the regulations. This is already addressed in Virginia Nutrient Management Standards and Criteria, Revised October 2005.
70	Commenter: NRCS
	Comment: Provide a definition or narrative to determine what constitutes a perennial or intermittent stream.
	Agency Response: DCR concurs. Virginia Tech has amended the definition of intermittent stream in the Virginia Phosphorus Index technical guide.
71	Commenter: VTCSES, VTPIT, Synagro
	Comment: Phosphorus Index” – Rewrite to ““Phosphorus index” means the Virginia Phosphorus Index Version 1.3 or the most current version.”
	Agency Response: The regulation was modified to replace version 1.3 with version 2.0. Additionally, members of the phosphorus index team have indicated that they do not expect frequent changes to occur. When future changes are necessary, the department will consider utilizing the “fast track” regulatory process to incorporate new versions of the phosphorus index.
72	Commenter: VTCSES
	Comment: “Pre-sidedress nitrogen test (PSNT)” Rewrite definition to “Pre-sidedress nitrate (PSNT)” or “PSNT” means a procedure used to determine nitrate-nitrogen levels during a corn growing season”
	Agency Response: DCR concurs and has modified the definition.
73	Commenter: VDH
	Comment: Modify the definition of PSNT to pertain to a specific time during the growing season.
	Agency Response: No action concerning the regulations. The procedure for the PSNT are described in Virginia Nutrient Management Standards and Criteria, Revised October 2005.
74	Commenter: VTCSES
	Comment: Residual nutrients” – Rewrite to “... or unharvested plants or plant parts, or naturally occurring nutrient levels in the soil.
	Agency Response: DCR concurs and has modified the definition.
75	Commenter: Synagro
	Comment: “RUSLE2” – Revise definition to allow for the use of updates.
	Agency Response: No action concerning the regulations. RUSLE2 is a computer software program that is frequently updated; therefore no version date is specified in the regulation. Use of the number “2” in RUSLE2 is used by NRCS to distinguish it from the outdated paper procedures of USLE and RUSLE.

76	Commenter: VTCSES
	Comment: "Sinkhole" – Do not understand portion of "sinkhole" definition that reads "...having drainage pattern through underground channels." We prefer "...a natural depression in a land surface communicating with a subterranean passage, generally occurring in limestone regions and formed by solution or by collapse of a cavern roof."
	Agency Response: No action concerning the regulations. The comment was discussed with the DCR Division of Natural Heritage's Karst Program. DCR believes the existing definition is preferable.
77	Commenter: NRCS
	Comment: "Sinkhole" – Provide narrative guidance or revised definition.
	Agency Response: No action concerning the regulations. However, the agency will attempt to develop future guidance concerning relative categorization of various types of sinkholes.
78	Commenter: VTCSES
	Comment: "Slowly available nitrogen" – Rewrite definition to "...such as polymer coated products, sulfur coated urea, methylene urea, and urea formaldehyde...." Also, what are "natural organics"? Does this include animal manures?
	Agency Response: DCR concurs and has amended the definition. Also, "natural organics" does include manures.
79	Commenter: VTCSES
	Comment: "Soil series" – Classification of "soil series" should include "morphological," in addition to chemical and physical properties of the soil.
	Agency Response: DCR concurs and has amended the definition.
80	Commenter: VTCSES
	Comment: "Soil survey" – Rewrite to "...means a published document developed by an officially accredited entity which includes..."
	Agency Response: DCR concurs and has amended the definition after consulting with Virginia Tech faculty to include more specific criteria.
81	Commenter: VTCSES
	Comment: "Split application" – Rewrite definition to "...separated by a time period appropriate to a specific crop in order to improve nutrient uptake"
	Agency Response: No action concerning the regulations. To reduce the potential for nitrogen loss, it is important to maintain some performance criteria in this definition.
82	Commenter: VTCSES
	Comment: "Tissue Test" Page 14 – Tissue tests are used in a large number of crops, not just small grains. For example, tomatoes, cotton, potatoes to name a few. Delete the phrase "with small grain crops." Rewrite definition to "...means an analysis of crop tissue for nutrient elements at key growth stages, and used as an intensive nutrient management technique." The corrected definition reflects more correctly the intent and use of tissue testing.
	Agency Response: No action concerning the regulations. Only small grain tissue testing for nutrient recommendations are contained in Virginia Nutrient Management Standards and Criteria, Revised October 2005. Small grain tissue testing has been specifically calibrated for use in Virginia through university research.

83	Commenter: VTCSSES
	Comment: “Water insoluble nitrogen” – “Water insoluble nitrogen” is evaluated on many fertilizers, not just urea formaldehyde. Delete “urea formaldehyde.”
	Agency Response: DCR concurs and has struck “urea formaldehyde” from the definition.

Eligibility requirements – 4 VAC 5-15-40

84	Commenter: VTCSSES
	Comment: Subdivision A 3; Rewrite to “Obtain a passing score on all parts of the nutrient...”
	Agency Response: No action concerning the regulations. DCR requires planners to independently achieve a passing score on both a core and practical exam.

Examination – 4 VAC 5-15-60

85	Commenter: VTCSSES
	Comment: Subsection B; Rewrite to “Applicants for certification shall achieve a passing score on all parts of the nutrient...”
	Agency Response: No action concerning the regulations. DCR requires planners to independently achieve a passing score on both a core and practical exam.
86	Commenter: VTCSSES
	Comment: Subsection C; “To address nutrient management on urban land uses, specialty specific examinations may be added to or substituted by the department for the elements below”. We recommend VERY STRONGLY that this statement be deleted.
	Agency Response: No action concerning the regulations. The turfgrass industry has asked DCR to consider developing a separate certification examination for urban nutrient management. The agency already has the authority to do this under the existing regulations.

Compliance with regulations and disciplinary action – 4 VAC 5-15-110

87	Commenter: Synagro, Recyc
	Comment: Delete the requirement in 4 VAC 5-15-110 that modified NMPs be submitted to DCR if the NMP is required by a permit process. This is duplicative in that NMPs would need to be provided to VDH and DCR and it would place the plan writers in jeopardy of compliance enforcement action if plans did not meet requirements.
	Agency Response: No action concerning the regulations. If plans do not meet the requirements, compliance and enforcement actions may be warranted.

Duties of other state agencies – 4 VAC 5-15-130

88	Commenter: Synagro
	Comment: Reinsert the language for 4 VAC 5-15-130 that states, “The provisions of this chapter shall not limit the powers and duties of other state agencies.”

	<p>Agency Response: No action concerning the regulations. Nutrient management plans, developed by DCR certified nutrient management planners, are now required in several laws and regulations of the Commonwealth. For example, state owned lands that receive nutrient applications will be required to have nutrient management plans by July 1, 2006.</p>
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Nutrient Management Plan Content – 4 VAC 5-15-140

89	<p>Commenter: VTCSES, Sharon S. Quisenberry</p> <p>Comment: Subsection A; The sentence: “For nutrient management plans covering nonagricultural, specialty land uses...” We recommend very strongly that this statement be deleted from this regulation.</p> <p>Agency Response: No action concerning the regulations. Nutrient management plans have already been developed for some urban lands, including some golf courses and areas managed by certain lawn service companies. If the statement is deleted, DCR and nutrient management planners will not have the flexibility to remove plan elements unrelated to nonagricultural specialty land uses.</p>
90	<p>Commenter: VDH</p> <p>Comment: Subsection A; Allow nutrient management planners to delete plan components not relevant to forestry sites.</p> <p>Agency Response: No action concerning the regulations. DCR reviewed the nutrient management plan content requirements in 4 VAC 5-15-140 and found the content to be necessary for forested sites that receive nutrient applications. Several recommendations for forest tree species are included in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>
91	<p>Commenter: VTCSES</p> <p>Comment: Subdivision D 9; The “expected days for incorporation of organic nutrient sources” should read “expected time of incorporation of organic nutrient sources after application” if the purpose of this section is for estimation of ammonia volatilization; otherwise, no reason to include this information.</p> <p>Agency Response: DCR concurs and has amended this section.</p>
92	<p>Commenter: VTCSES</p> <p>Comment: Subdivision F 5; Should read “Liming recommendations if soil pH is below optimal range or to raise soil pH to no more than upper limit for lime-stabilized biosolids;”</p> <p>Agency Response: DCR concurs and has amended this section.</p>
93	<p>Commenter: Barbara Wenger, Byron Wenger, Eleanor Funkhouser, Mary H. Carwile, D. W. Burruss II, Charlotte Hughes, Roy K. Harris, Nancy K. Harris, Hampton E. Forbes, Jr., Betty A. Forbes, J. Hufner</p> <p>Comment: Subsection G; It is important for DCR to keep in mind that there are reasons for additional protections when dealing with this treated sewage sludge. It is important that nutrient management plans clearly include all nutrient restrictions imposed by agencies (VDH, DEQ and EPA are examples) that are supposed to protect the public when biosolids are spread.</p>

	Agency Response: DCR concurs that nutrient management plans should contain more restrictive practices when required by other laws or regulations. However, it is impractical to list each specific technical circumstance where another law or regulation requires more restrictive criteria than those in this regulation. The section 4 VAC 5-15-140.G. has been amended to clarify that the nutrient management planner shall incorporate more restrictive plan requirements if required by other specific legislative, regulatory or incentive programs.
94	Commenter: Henry J. Staudinger
	Comment: Subsection G; The proposed regulations fail to comply with a legislative mandate that all more stringent requirements of biosolids permit requirements be included (CoVa §32.1-164.5H, e.g.). Amend 4 VAC 5-15-140G to read as follows: The nutrient management planner shall incorporate nutrient provisions set forth in DCR regulations as well as the more restrictive plan requirements and any additional restrictive plan requirements that do not reduce the protections afforded by DCR’s that may be required by other legislative, regulatory or incentive programs. Plans shall be updated to incorporate all subsequently adopted requirements that are consistent with this provision.”
	Agency Response: DCR has added the phrase “more restrictive” to section 4 VAC 5-15-140.G. However, DCR does not believe it appropriate to require all existing nutrient management plans be updated prior to their stated plan expiration date.

Nutrient Management Plan Criteria – 4 VAC 5-15-150

95	Commenter: VFBF, MSWCD, Linda Boitnott, SSC
	Comment: Subsection A; Plans should allow application above regulatory thresholds where it is proven that application shows a positive and economic response.
	Agency Response: No action concerning the regulations. Several flexibilities are included in the regulations and associated criteria to accomplish this. These include the ability of planners to make reasonable adjustments to planning yields, the use of actual farmer yields from yield records, the use of the pre-sidedress nitrate test in corn, and the use of petiole sap nitrate testing in white potatoes.
96	Commenter: VTCSES
	Comment: Subdivision A 2 a; Delete the date (2004) for the Commercial Vegetable Production Recommendations. Justification: Referencing a specific year, will not allow producers to use updated or revised recommendations. This document is revised periodically based on new scientific information. Precedence has been established with this in the definition of RUSLE2 (4 VAC 5-15-10)
	Agency Response: The date has been revised to the 2005 version of the Commercial Vegetable Production Recommendations. DCR will consider technical changes to the regulation to adopt future versions of this publication. RUSLE2 is a computer program that is updated frequently
97	Commenter: VAMWA, HRSD, SCWA, PFRWTA, HCDPU, Arlington County Pollution Bureau
	Comment: DCR has not cited any scientific source for the basis of its modification for phosphorus management for NMPs.

	Agency Response: No action concerning the regulations. There has been a great deal of published documentation in peer-reviewed journals of the impacts of excessive phosphorus applications. States have developed phosphorus management criteria in response to the NRCS 590 National Nutrient Management Standard and the U.S. Environmental Protection Agency’s NPDES requirements for certain animal feeding operations.
98	Commenter: NRCS
	Comment: NRCS supports phosphorus based nutrient management for Virginia.
	Agency Response: No action concerning the regulations. DCR concurs.
99	Commenter: John Haile
	Comment: If a phosphorus restriction is added, I will probably get no more biosolids since my land tests very high in phosphorus.
	Agency Response: No action concerning the regulations. A soil test in the “very high” range does not prohibit biosolids land application unless the soil is at or above 65% saturation or the phosphorus index rating is over 100.
100	Commenter: VAC, VPF, AE, VSDA, NB, VDACS, VFBF, MSWCD, Chad May, Danny Sutton, A. Lee Williams, Linda Boitnott, Robert Tate, Richard Hartley, Paul Beyer, VSA, Synagro, Lynn Gale, David Hickman, Bruce Holland
	Comment: Remove the zero phosphorus application cut-offs in the phosphorus index and the 65% and 50% phosphorus saturation criteria. Some commenters indicated the lowest rate of allowable phosphorus application for confined animal operations should be crop removal amounts, not zero.
	Agency Response: DCR has removed the 50% saturation limit for phosphorus application that was scheduled to take effect after 12/31/2010. However, the 65% phosphorus saturation criteria and the zero cutoffs in the phosphorus index have been retained. A delayed implementation schedule (until 12/31/2010) has been included for certain existing operations using on-farm generated liquid swine manure or liquid dairy manure or on-site generated liquid sewage sludge. These operations have fewer options for transfer or alternative uses and need time to develop additional land application areas, adopt feeding practices to reduce phosphorus in manure, or develop alternative uses. DCR remains committed to working with the affected industries to help address these issues. The Department has previously provided cost-share grant funding of nearly \$117,000 to install Phytase injection equipment to allow for reduced phosphorus in swine feed in Murphy-Brown (previously Carroll’s Foods) feedmills in Virginia, and provided similar grants to the poultry industry totaling \$796,000. DCR has recently committed to fund a dairy feed management incentive program that will provide incentives to dairy farmers to reduce phosphorus in feed rations to levels.
101	Commenter: Lynton Land
	Comment: Applying P at a rate higher than crop removal will ensure further P loading of soils already overloaded with P. Why is land application to be permitted at rates above crop removal on some sites? The soil test P method would have no negative impacts on agricultural crop productivity; it best achieves the objective of reducing P loading of soil, and is most protective of water quality and reducing pollution in the Chesapeake Bay. Why is the straightforward, common sense soil test P method not being mandated? Why is the proposed regulation more permissive for over application of organic phosphorus relative to inorganic fertilizer phosphorus? Organic nutrient sources should be treated as stringent as inorganic fertilizer in this regard.

	<p>Agency Response: No action concerning the regulations. Many soils have phosphorus levels that are higher than established levels at which the likelihood of crop yield response to additional phosphorus applications are extremely remote. University nutrient recommendations have historically focused on economic crop response to purchased nutrients as a basis for levels of recommendation. However, levels of phosphorus application that cause water quality concerns are not necessarily the same levels as those used to recommend application based on economic crop response for purchased nutrients. Under the final regulation, some fields with soil tests above the economic crop response levels will be able to apply greater than crop removal amounts, whereby other higher risk fields will not be able to apply any phosphorus. In waste disposal situations, organic nutrient sources have a zero or negative economic value. In developing the regulations, the agency attempted to balance economic costs to the industry while improving water quality benefits.</p>
102	<p>Commenter: Garnett Mellen, David W. Carr, Jr., Tanya A. Harvey, Esq.</p> <p>Comment: We are most concerned with lands that have high phosphorous levels already. Future phosphorus applications to these lands need to be eliminated.</p> <p>Agency Response: No action concerning the regulations. DCR concurs that there are situations where it is not appropriate to apply additional phosphorus due to high loss potential or soil phosphorus saturation and has provided for that criteria in the final regulations.</p>
103	<p>Commenter: John McDonald</p> <p>Comment: We just went to phosphorus based plans a few years ago. It's too soon to go to zero on phosphorus rates.</p> <p>Agency Response: DCR has removed the 50% saturation limit for phosphorus application that was schedule to take effect after 12/31/2010. However, the 65% phosphorus saturation criteria and the zero cutoffs in the phosphorus index have been retained. A delayed implementation schedule (until 12/31/2010) has been included for certain existing operations using on-farm generated liquid swine manure or liquid dairy manure or on-site generated liquid sewage sludge. These operations have fewer options for transfer or alternative uses and need time to develop additional land application areas, adopt feeding practices to reduce phosphorus in manure, or develop alternative uses. The Poultry Waste Management Act directs DCR to include criteria for nutrient management plans that "...reduce soil concentrations of phosphorous or phosphorous loadings." In some cases, this requires that no further applications of phosphorus occur. In addition, state commitments to reduce nutrient loadings to the Chesapeake Bay and Virginia rivers requires the Commonwealth to seek reductions from nearly all sources.</p>
104	<p>Commenter: CBF</p> <p>Comment: For the protection of water quality, it is imperative that the final nutrient management regulations retain the prohibition on applying phosphorus to soils that are already saturated. As soils become saturated with phosphorus, the potential for loss of soluble phosphorus in surface runoff increases significantly (see the Virginia Tech publication entitled "Phosphorus, Agriculture & the Environment" by Mullins, and the USDA publication "Dispelling Common Myths about Phosphorus in Agriculture and the Environment" by Sharpley. Algal blooms triggered by excess nutrients, decrease dissolved oxygen in water and increases production of toxins resulting in fish kills.</p> <p>Agency Response: No action concerning the regulations. There are situations where it is not appropriate to apply additional phosphorus due to high loss potential or soil phosphorus saturation.</p>

105	<p>Commenter: NRCS</p> <p>Comment: NRCS supports cutting off all phosphorus application in high risk situations. NRCS supports the concept that both source and transport factors should be considered in assessing risk of P loss from any field. NRCS also supports the concept that certain Virginia fields may have become so saturated with phosphorus that they should be restricted from receiving all additional P applications without regard to transport factors. Virginia Tech’s phosphorus management experts have recommended the 65% phosphorus saturation cutoff for future applications.</p> <p>Agency Response: No action concerning the regulations. DCR agrees that there are situations where it is not appropriate to apply additional phosphorus due to high loss potential or soil phosphorus saturation.</p>
106	<p>Commenter: VPF, VSDA, VAMWA, HRSD, PFRWTA, BPRC, Tyson Foods, Chad May, Danny Sutton, VDACS, TFI, NRCS, Synagro</p> <p>Comment: There is no scientific justification presented for the proposed 50% phosphorus saturation criteria and it should be removed from the regulation. Some commenters indicated that Virginia Tech was not consulted on this provision; it was not discussed or agreed to by the TAC, or conflicts with nutrient requirements of intensive crops like potatoes.</p> <p>Agency Response: DCR has removed the 50% saturation limit for phosphorus application that was schedule to take effect after 12/31/2010. A Virginia Tech member of the Technical Advisory Committee did present a 20-year plan to reduce excessive soil phosphorus. The plan reached 20% saturation, the point at which maintenance applications of phosphorus might be necessary to maintain crop productivity.</p>
107	<p>Commenter: JRA</p> <p>Comment: The shift of maximum phosphorus saturations levels from 65% in 2005 to 50% in 2010 provides a concrete timeframe by which the industry needs to develop alternative uses for manure in regions where soils are saturated with phosphorus.</p> <p>Agency Response: Due to concerns from the agricultural community, sewage sludge generators and applicators, and some researchers, DCR has removed the 50% saturation limit for phosphorus application that was scheduled to take effect after 12/31/2010.</p>
108	<p>Commenter: VTCSES, VTPIT</p> <p>Comment: We do not support the lowering of the upper phosphorus saturation level to 50% after 12/31/2010. The upper limit of 65% is conservative. Recommendation: Delete the recommendation of using a 50% phosphorus saturation level after 12/31/2010.</p> <p>Agency Response: Due to concerns from the agricultural community, sewage sludge generators and applicators, and some researchers, DCR has removed the 50% saturation limit for phosphorus application that was schedule to take effect after 12/31/2010.</p>
109	<p>Commenter: BPRC, TFI, Danny Sutton, CSWCD</p> <p>Comment: We support the use of the Virginia Tech P site index that DCR has offered as an option for managing the application of phosphorus. Commenters cited that it is good science and is a good addition to the regulation, or that it provides sludge contractors with a degree of flexibility.</p> <p>Agency Response: No action concerning the regulations. The phosphorus index is provided as one method to determine the rate of application for organic nutrient sources.</p>

110	<p>Commenter: VPF, VSDA</p> <p>Comment: While we support phosphorus indexing, we are concerned that the cost of developing a private plan could be as high as \$12 - \$15 per acre.</p> <p>Agency Response: No action concerning the regulations. The phosphorus index is provided as one method to determine the rate of application for organic nutrient sources. There are other methods, such as the environmental threshold, that will have less expensive plan development costs. If a particular farm needs to maximize phosphorus applications, there will be greater time and financial cost associated with the development of the plan, as well as less flexibility in making cropping changes in fields.</p>
111	<p>Commenter: NRCS</p> <p>Comment: NRCS believes the phosphorus index is the best approach to phosphorus management. DCR is providing too many options to planners and farmers for the use of other phosphorus criteria to determine application rates, such as the environmental threshold, that will marginalize the use of the phosphorus index method. The proposed criteria increases plan complexity greatly. Even though NRCS is supportive of the P-Index, abandoning the P-Index in favor of a simplified environmental threshold approach would be better for water quality than a multi-pronged complex P management approach.</p> <p>Agency Response: Planners and farmers have asked for approaches that may be simpler and less time-consuming than the phosphorus index, such as the phosphorus environmental threshold. The elimination of the 50% phosphorus saturation criteria and the streamlining the 65% saturation screening criteria for the phosphorus index has provided additional simplification. DCR concurs that offering farmers and planners the flexibility of choosing between several acceptable phosphorus management methods has led to increased complexity.</p>
112	<p>Commenter: VPF</p> <p>Comment: Give farmers the option of a simple crop removal plan.</p> <p>Agency Response: No action concerning the regulations. Farmers with soils below 35% phosphorus saturation are given the option of a simple phosphorus crop removal plan if they opt to use the phosphorus environmental threshold approach.</p>
113	<p>Commenter: Sharon S. Quisenberry</p> <p>Comment: The use of soil test phosphorus method and environmental threshold method are not the best method for determining phosphorus loss. These address only the source component of phosphorus loss and not the transport component.</p> <p>Agency Response: No action concerning the regulations. DCR has attempted to provide planners and landowners with a range of options in dealing with phosphorus.</p>
114	<p>Commenter: VTCSES, VTPIT</p> <p>Comment: We recommend that the Environmental Threshold method and Table 4.2 in the standards and criteria document be deleted. Although this is not presented, these upper limits for this optional method assume 35% phosphorus saturation. What is the scientific basis of setting an upper limit of 35% phosphorus saturation?</p>

	<p>Agency Response: No action concerning the regulations. The phosphorus environmental threshold option, based on 35% saturation, was developed to provide planners with a simpler and less time consuming approach to develop phosphorus based nutrient management plans. The option was also included to provide farmers that have operational difficulties in achieving low levels of soil loss (an input to the phosphorus index), such as dairy farmers with silage rotations, an alternative approach that allows some phosphorus to be applied to certain fields. The 35% level was chosen because it is a conservative intermediate step between the 20% and 65% saturation levels where it is appropriate to use the phosphorus index. Additionally, soil test calibration data was available for this level. Although there are definite potential water quality impacts by allowing continued phosphorus applications up to 35% saturation, if phosphorus applications are limited to crop removal amounts, these impacts will not be excessive for many sites.</p>
115	<p>Commenter: VTCSES</p> <p>Comment: Where is the documentation for the sources of the Phosphorus removal data used in Table 4-7? How can we be assured that these numbers are based on “real data” and not personal opinion? Were appropriate faculty at Virginia Tech consulted to review these data? If a producer has nutrient analysis data for crops grown on a given field, can these measured values be used in the place of those presented in Table 4-7? Members of the Mid-Atlantic Regional Water Quality program recently developed by regional-consensus a table with Phosphorus removal for most crops produced in the Mid-Atlantic region. These regional phosphorus removal data are available at: http://mawaterquality.psu.edu/croptable.html. The numbers are currently being used by the regional nutrient budget team of the Mid-Atlantic Regional Water Quality Program. We recommend that DCR take a look at these regional P removal data.</p> <p>Agency Response: The phosphorus crop removal numbers for major agronomic crops grown in Virginia were agreed to in 2001 by DCR and Dr. Greg Mullins, formerly at Virginia Tech. These same numbers were subsequently adopted by Virginia Tech in the phosphorus index. To produce a listing of phosphorus removals for minor crops, DCR relied primarily upon USDA-NRCS tables and those of surrounding states including Maryland. DCR has conformed the phosphorus removal numbers to the Mid-Atlantic Regional Water Quality program’s table in the few instances where deviations of any significant level occurred.</p>
116	<p>Commenter: Tyson Foods</p> <p>Comment: DCR is proposing that only the soil test phosphorus method be used to determine phosphorus application. Tyson Foods disagrees with this decision and favors the Virginia Phosphorus Index Version 1.3, rev. March 2005 as the method to develop these plans.</p> <p>Agency Response: No action concerning the regulations. DCR provides several options to planners and farmers working with phosphorus in organic nutrient sources, including the phosphorus index.</p>
117	<p>Commenter: VAMWA, HRSD, PFRWTA, BPRC</p> <p>Comment: Align the regulations with the latest version of the P site index.</p> <p>Agency Response: The regulations were modified to replace version 1.3 with version 2.0. Members of the phosphorus index team have indicated that they do not expect changes to occur on a frequent basis.</p>

118	<p>Commenter: CBF, JRA</p> <p>Comment: Virginia’s proposal for phosphorus management is consistent with USDA-NRCS and other Bay states, including Maryland and Pennsylvania. It also provides flexibility to farmers by allowing them to choose between three distinct options (soil test P, environmental threshold, and phosphorus index) for determining the appropriate level of phosphorus application.</p> <p>Agency Response: No action concerning the regulations. DCR concurs.</p>
119	<p>Commenter: SELC</p> <p>Comment: Allowing the use of the phosphorus index was a major compromise accepted with reservations by some of the environmental representatives on the TAC. It is imperative that the regulations allow no more phosphorus to be applied to those soils already saturated with phosphorus. Beyond the obvious protection of water quality, there are other reasons for prohibiting phosphorus application to soils already saturated with phosphorus. Given that this program involves self reporting, a producer could over-apply P to his fields and not be caught. However, if there is an ultimate limit beyond which no P can be applied, the producer knows that he will eventually be prohibited from using that field for additional P application and has some reason to restrain himself from over-application.</p> <p>Agency Response: No action concerning the regulations. DCR concurs.</p>
120	<p>Commenter: HSWCD, Augusta County Farm Bureau Federation</p> <p>Comment: Adopt phosphorus planning criteria whereby nitrogen based plans could be developed for all fields where soil erosion was below the tolerance level of “T” and fields are below 65% phosphorus saturation (where the NRCS 590 Standard allows no more phosphorus to be applied). Certified planners would need to calculate soil erosion using RUSLE. This approach would be simpler and would encourage farmers to adopt practices such as contour strip cropping, cover crops, or buffer strips that can be used to reduce soil erosion so that they could apply litter under a nitrogen based plan.</p> <p>Agency Response: No action concerning the regulations. Although the suggested approach is interesting and has merit conceptually, DCR compared the phosphorus index to this suggested approach and found the phosphorus index to be more protective of water quality. DCR met with NRCS staff during the regulatory development process to discuss the possibility of a conceptually similar approach. NRCS had concerns about workload ramifications and DCR was concerned with forcing all certified planners with the additional workload of including soil erosion plans in all nutrient management plans.</p>
121	<p>Commenter: Lynton Land</p> <p>Comment: The Virginia P-Index is based on undocumented and permissive science. The P-Index is not straightforward and time efficient to apply, or easy to understand. Why is the cumbersome and complex phosphorus index, poorly grounded in science, and capable of being manipulated to yield a minimum result, being advocated?</p> <p>Agency Response: No action concerning the regulations. DCR believes the phosphorus index approach, developed in conjunction with Virginia Tech, does have scientific merit given the current level of knowledge. Although DCR agrees that the phosphorus index may increase the time and complexity of nutrient management plans, the dairy, poultry, swine, and biosolids sectors have all voiced a strong desire to have an option to use the phosphorus index.</p>

122	<p>Commenter: David Long</p> <p>Comment: Need to promote crop rotations that use a lot of phosphorus.</p> <p>Agency Response: No action concerning the regulations. DCR concurs that selecting crop rotations that increase crop phosphorus removal would be beneficial. The phosphorus provisions of the regulations will encourage farmers to consider crops and rotations that remove more phosphorus.</p>
123	<p>Commenter: Lynton Land</p> <p>Comment: The Board of Health regulation 12 VAC 5-585-550A. states “The applied nitrogen and phosphorus content of biosolids shall be limited to amounts established to support crop growth.” Why is this statement in 12 VAC 5-585-550A. being ignored and violated by the Virginia Department of Health?</p> <p>Agency Response: No action concerning the regulations. DCR will appraise the Department of Health of the concern.</p>
124	<p>Commenter: NRCS</p> <p>Comment: NRCS supports the use of RUSLE2 exclusively for determining the soil erosion input for the phosphorus index. NRCS will not use or support the use of the Erosion Risk Assessment procedure developed by DCR.</p> <p>Agency Response: No action concerning the regulations. DCR developed the Erosion Risk Assessment procedure as an optional method to estimate soil erosion in response to concerns expressed by members of the Technical Advisory Committee and other plan writers. Specifically, there were concerns about the workload of using RUSLE2 in all situations and the desire to be able to provide a stand-alone computer program (NutMan) for planners to be able to use. DCR clearly states in the Virginia Nutrient Management Standards and Criteria, Revised October 2005, that the use of the Erosion Risk Assessment is only for use in nutrient management planning and should not be substituted for RUSLE2 in any other program. Use of RUSLE2 may be used in lieu of the Erosion Risk Assessment for use in the phosphorus index.</p>
125	<p>Commenter: VTCSES, VTPIT</p> <p>Comment: NRCS’s RUSLE2 is the best, science-based tool available for estimating soil losses from agricultural fields. We recommend that RUSLE2 be used to estimate soil loss when using the Virginia Phosphorus Index.</p> <p>Agency Response: No action concerning the regulations. DCR developed the Erosion Risk Assessment procedure as an optional method to estimate soil erosion in response to concerns expressed by members of the Technical Advisory Committee and other plan writers. Specifically, there were concerns about the workload of using RUSLE2 in all situations and the desire to be able to provide a stand-alone computer program (NutMan) for planners to be able to use. Use of RUSLE2 is allowed in lieu of the Erosion Risk Assessment for use in the phosphorus index.</p>

126	<p>Commenter: VTPIT</p> <p>Comment: The scientific basis of the Erosion Risk Assessment (ERA) method that DCR has proposes to be an optional method to estimate soil loss in lieu of RUSLE2 is unknown. As part of a recent project funded by DCR, RUSLE2 and the ERA were compared for 281 fields in Virginia. The two methods varied by as much as five to eight times difference in comparing soil loss for some individual fields. When the P-Index was run on the 281 fields using both the RUSLE2 and the ERA, different P-Index rating categories resulted in 38 of the fields. For 30 of the fields, the ERA resulted in a lower phosphorus application rate. We recommend the ERA not be included as an option for soil loss estimates for the P-Index.</p> <p>Agency Response: No action concerning the regulations. DCR considers a soil loss tool that: (1) relies on information already collected to do nutrient management plans today, (2) which arrives at the same phosphorus index rating as using the RUSLE2 in 243 fields out of 281 total (86.5%) and, (3) only under predicts soil loss in less than 3% of fields to be as accurate as could be expected. DCR developed the Erosion Risk Assessment procedure as an optional method to estimate soil erosion in response to concerns expressed by members of the Technical Advisory Committee and other plan writers. Specifically, there were concerns about the workload of using RUSLE2 in all situations and the desire to be able to provide a stand-alone computer program (NutMan) for planners to be able to use. Use of RUSLE2 is allowed in lieu of the Erosion Risk Assessment in the phosphorus index if the planner and farmer desire.</p>
127	<p>Commenter: NRCS</p> <p>Comment: In the documentation required to be in plans related to RUSLE2 calculations, delete “profile erosion record,” the phrase “specified by calendar year to match those identified in the nutrient management plan,” and replace “edge of field soil loss” with “soil loss for conservation planning or sediment delivery soil loss values.”</p> <p>Agency Response: DCR is maintaining the requirement for the “profile erosion record” to be included as part of the plan if RUSLE2 is used to develop the phosphorus index rating. This information is needed by DEQ inspectors to verify compliance with the plan on regulated operations. However, the reference to calendar year is being deleted to decrease potential for conflicts between nutrient management plans and soil conservation plans. DCR does accept that the RUSLE2 designation of “soil loss for conservation planning” should be acceptable as well as “edge of field soil loss” and has modified the regulations.</p>
128	<p>Commenter: MSWCD</p> <p>Comment: RUSLE2 slope and slope length determinations are somewhat subjective. We recommend the slope and length determinations be consistent with those used in developing conservation plans and match those from NRCS files.</p> <p>Agency Response: No action concerning the regulations. Verification for consistency with NRCS files may be preferable, but would potentially delay plan development in some cases.</p>
129	<p>Commenter: VPF</p> <p>Comment: Amend the phosphorus index to eliminate the inclusion of the rate of applied phosphorus source factor and method of application factor as an input. Water quality is protected enough without these factors.</p>

	Agency Response: No action concerning the regulations. A key and significant component of the phosphorus index is the quantification of risk associated with the rate, placement, and source of phosphorus applied. Research has verified that in some cases losses from recent phosphorus applications can be the largest source of phosphorus loss. Other states within the mid-Atlantic region and NRCS include this factor in their phosphorus indices.
130	<p>Commenter: Mac Williams</p> <p>Comment: The phosphorus restrictions will increase fertilizer sales and push more land into development by increasing costs to the farmer.</p> <p>Agency Response: No action concerning the regulations. Phosphorus based nutrient management can increase costs to farmers with excessive phosphorus if they need to buy supplemental nitrogen and potassium. However, redistributed nutrients in manures and biosolids will decrease fertilizer costs elsewhere.</p>
131	<p>Commenter: VAMWA, HRSD, PFRWTA, BPRC, Synagro</p> <p>Comment: Allow phosphorus banking for up to five years instead of the three year life of a nutrient management plan.</p> <p>Agency Response: No action concerning the regulations. The regulations allow phosphorus banking whereby a single large phosphorus application may be applied for multiple crops, up to the life of the nutrient management plan. Plan life is limited to a maximum of three years for cropland and five years for hay and pasture. For accountability reasons, DCR does not want to allow phosphorus banking beyond the term of a nutrient management plan.</p>
132	<p>Commenter: VDACS, SSC, AE</p> <p>Comment: Allow farmers to make phosphorus applications based on uptake needs of the intended crop instead of those for the existing cover crop.</p> <p>Agency Response: No action concerning the regulations. Phosphorus nutrient needs and crop nutrient removal are zero for cover crops since there is no harvest of grain or forage. However, phosphorus applications made to a cover crop may be banked for use in the future crop.</p>
133	<p>Commenter: DEQ</p> <p>Comment: Determination of the “subsurface risk factor” used in the phosphorus index calculation, does not seem to specify in the regulation or the P-index technical guide, what to do if only a portion of the field is tile-drained. DEQ recommends that the planner be allowed to use a weighted average of subsurface risk factors if the subsurface risk factors vary throughout the field, or as alternative, recommend that the field be managed in sub-sections according to the variations in drainage.</p> <p>Agency Response: DCR concurs and has amended the instructions concerning the use of the phosphorus index in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>

134	<p>Commenter: DEQ</p> <p>Comment: The phosphorus management criteria included in the amended nutrient management regulation will meet the requirements of the Virginia Pollution Abatement regulations (9 VAC 25-192, 9 VAC 25-630) for animal feeding operations and Virginia Pollutant Discharge Elimination System regulations (9 VAC 25-191) for concentrated animal feeding operations. These DEQ regulations require that nutrient management plans written after December 31, 2005 shall also include provisions to minimize phosphorus loss to ground and surface waters. In light of this requirement, DEQ encourages DCR to make the effective date of the final regulation to be January 1, 2006.</p>
	<p>Agency Response: No action concerning the regulations. DCR concurs.</p>
135	<p>Commenter: VTPIT</p> <p>Comment: The Phosphorus-Index development team recently completed a project with a primary objective of expanding the soils database for the Virginia Phosphorus-Index. Based on analytical work from this larger and expanded soils data set that includes 42 Virginia Counties, the Virginia Tech Phosphorus Index Team recommends the following modifications to Version 1.3 of the Virginia Phosphorus Index. Adjustments to the Mehlich 1 soil test phosphorus levels for three state regions associated with the 20% and 65% P/(Al+Fe) saturation levels used for screening sites appropriate for use of the phosphorus index; modifications to the equations for sediment total P factor; the equations for the runoff DRP factor; the equations for the subsurface DRP factor; and modification of stratification factors for hay/pasture and continuous no-till fields. Our Phosphorus Index development team can provide DCR with an amended Phosphorus Index Technical Guide reflecting these changes.</p>
136	<p>Commenter: VTPIT</p> <p>Comment: Clarify the first sentence of the description of “Phosphorus Index Method” in the standards and criteria document as follows: “... management strategy for phosphorus sources applied to agricultural lands.”</p>
	<p>Agency Response: DCR concurs and has amended this language in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>
137	<p>Commenter: VTPIT</p> <p>Comment: The Virginia Tech P-Index development team has analyzed a set of soil samples collected from 42 Virginia counties to compare extractable phosphorus using the Mehlich 3 and Mehlich 1 soil extracts. The two methods correlate well, but the relationship becomes non-linear, particularly at levels above the range where adequate agronomic levels of P typically exist in soils. In reviewing the relationships indicated by the data, DCR should consider amending the phosphorus correlations used in Virginia Nutrient Management Standards and Criteria, Rev. 2005 for laboratories that use the Mehlich 3 method. Virginia Tech can make this Mehlich 3 vs. Mehlich 1 data available to DCR upon request.</p>
	<p>Agency Response: DCR concurs and has amended the soil test phosphorus conversions for laboratories using the Mehlich 3 method, based on the Virginia Tech correlation equations provided. The new conversion methods are contained in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>

138	<p>Commenter: Sharon S. Quisenberry, Leslie Drewer, David Long</p> <p>Comment: There are cases where crops respond to small additions of phosphorus even though soil test levels are high. These may include cold soils or a lack of moisture.</p> <p>Agency Response: No action concerning the regulations. If soils test within the “high” range in phosphorus, there are recommendations to apply phosphorus for most crops. This would be most efficiently applied as a banded starter fertilizer. In the case of soils testing “very high,” there are limited situations where a starter phosphorus application may be made. The Commercial Vegetable Production Recommendations, 2005 indicates that warm season crops such as sweet corn, tomatoes, eggplants, and the vine crops are seeded or transplanted and soil temperatures are below 65 degrees F, up to 20 pounds of P₂O₅ per acre may be applied when soils test levels are above optimum. The document defines “above optimum” soil levels as the same as “very high.” Virginia Nutrient Management Standards and Criteria, Revised October 2005 allows for up to 30 pounds of P₂O₅ per acre to be banded for white potatoes for soils testing very high in phosphorus. Since both of these documents are promulgated by reference, planners can recommend these small fertilizer phosphorus applications to very high testing soils as long as the phosphorus level does not exceed 65% saturation (i.e., 458 ppm Mehlich I P in the lower coastal plain).</p>
139	<p>Commenter: VTCSSES</p> <p>Comment: Rewrite 150 A. 2. c. (1) to read: “...shall not exceed crop nutrient needs over the crop rotation based on a soil test or nutrient recommendations for specific crops (i.e., starter fertilizer and some vegetable crops).” The proposed language is too restrictive when considering the phosphorus needs of the diverse crops that are grown in Virginia.</p> <p>Agency Response: No action concerning the regulations. (Same response as above.) If soils test within the “high” range in phosphorus, there are recommendations to apply phosphorus for most crops. This would be most efficiently applied as a banded starter fertilizer. In the case of soils testing “very high,” there are limited situations where a starter phosphorus application may be made. The Commercial Vegetable Production Recommendations, 2005 indicates that warm season crops such as sweet corn, tomatoes, eggplants, and the vine crops are seeded or transplanted and soil temperatures are below 65 degrees F, up to 20 pounds of P₂O₅ per acre may be applied when soils test levels are above optimum. The document defines “above optimum” soil levels as the same as “very high.” Virginia Nutrient Management Standards and Criteria, Revised October 2005 allows for up to 30 pounds of P₂O₅ per acre to be banded for white potatoes for soils testing very high in phosphorus. Since both of these documents are promulgated by reference, planners can recommend these small fertilizer phosphorus applications to very high testing soils as long as the phosphorus level does not exceed 65% saturation (i.e., 458 ppm Mehlich I P in the lower coastal plain).</p>
140	<p>Commenter: Henry J. Staudinger</p> <p>Comment: In 150A.2.c. the proposed regulations should be modified to include the additional restrictions imposed by other regulations or an explanation as to their omission. For example, BUR provides: “...The applied nitrogen and phosphorus content of biosolids shall be limited to amounts established to support crop growth.”12 VAC 5-585-550 A. Current biosolids regulations limit applications to forages and hay lands to early spring and/ or late summer, and effectively prohibit application to nitrogen fixing crops. DCR’s regulations should incorporate these mandates to apply not only to biosolids, but to all nutrient applications.</p>

	Agency Response: DCR concurs that nutrient management plans should contain more restrictive practices when required by other laws or regulations. The subsection 4 VAC 5-15-140.G. has been amended to clarify that the nutrient management planner shall incorporate more restrictive plan requirements if required by other specific legislative, regulatory or incentive programs.
141	<p>Commenter: TFI</p> <p>Comment: Subdivision A 2 d; Do not regulate nutrients that have no known environmental impact, such as potassium.</p> <p>Agency Response: Nutrient management plans need to include potassium applications if soils are shown to be deficient in this nutrient. Potassium deficiency can result in reduced crop uptake and utilization of nitrogen and phosphorus. The projected yields and nitrogen and phosphorus application rates contained in Virginia Nutrient Management Standards and Criteria, Revised October 2005, assume a high level of management that would include an adequate supply of potassium. However, for secondary and micronutrients, the regulations were amended to recommend (rather than require) that these nutrients be applied at agronomically or economically justifiable levels.</p>
142	<p>Commenter: VAMWA, HRSD, PFRWTA</p> <p>Comment: Subdivision A 2 d; Biosolids generators should not be required to ensure potassium levels meet DCR’s standards.</p> <p>Agency Response: No action concerning the regulations. Nutrient management plans need to include potassium applications if soils are shown to be deficient in this nutrient. Potassium deficiency can result in reduced crop uptake and utilization of nitrogen and phosphorus. The projected yields and nitrogen and phosphorus application rates contained in Virginia Nutrient Management Standards and Criteria, Revised October 2005, assume a high level of management that would include an adequate supply of potassium.</p>
143	<p>Commenter: NRCS</p> <p>Comment: Subdivision A 2 d; NRCS continues to believe that plans will be most useful to farmers if they include complete recommendations for all nutrients (secondary and micronutrients) needed to achieve yield goals. For example, Virginia Tech generally recommends high rates for potassium and boron on alfalfa. The importance of providing accurate recommendations for these non-polluting nutrients for achieving yield goals should be emphasized.</p> <p>Agency Response: DCR generally concurs and has included pertinent notes in Virginia Nutrient Management Standards and Criteria, Revised October 2005 for crops with standing recommendations, such as boron on alfalfa, peanuts, and cotton.</p>
144	<p>Commenter: VTCSES</p> <p>Comment: Subdivision A 2 d; This statement regulates application rates of nutrients that do not have an “off-farm” impact on water quality. While the intent of the statement is probably to develop plans that have balanced fertilization to insure efficient use of N and P, this statement sets a precedent for regulating nutrients that are not an environmental concern, and there is no reason to regulate these nutrients. Recommendation: This section should be deleted.</p>

	<p>Agency Response: Nutrient management plans need to include potassium applications if soils are shown to be deficient in this nutrient. Potassium deficiency can result in reduced crop uptake and utilization of nitrogen and phosphorus. The projected yields and nitrogen and phosphorus application rates contained in Virginia Nutrient Management Standards and Criteria, Revised October 2005, assume a high level of management that would include an adequate supply of potassium. However, for secondary and micronutrients, the regulations were amended to recommend (rather than require) that these nutrients be applied at agronomically or economically justifiable levels.</p>
145	<p>Commenter: VTCSES</p> <p>Comment: Subdivision A 2 e; This section dealing with expected crop yields is very unclear. What does “provided the upward adjustments impact no more than 20% of the fields on a particular farm and the expected crop yields do not exceed the soil productivity group rating of any soil series that directly adjoins the soils contained in the specific field as indicated in the soil survey” mean? Since most fields in Virginia include soils with varying levels of productivity, then this statement reads as though expected yields could not be above the “least productive” soils in the field because these soils adjoin the other soils. Recommendation: Delete this as it poses a very difficult, if not impossible, task for the planner and the farmer.</p> <p>Agency Response: The agency did not interpret the proposed language to mean it would limit yields to the lowest yielding adjoining soil, but rather to that of the highest yielding soil. The proposed language resulted from a recommendation from the Joint Legislative Audit and Review Commission (JLARC) that DCR either eliminate the provision allowing planners to adjust yields without yield records or limit its usage. However, upon further consideration, DCR finds the language to be confusing and has amended the language to eliminate the reference to adjoining soils but does require that the upward adjustments impact no more than 20% of the acreage of any crop on a particular farm.</p>
146	<p>Commenter: VPF</p> <p>Comment: Subdivision A 2 e; Eliminate the language that requires the use of directly adjoining soil series that reduces farmer flexibility in using past experience in lieu of verified crop yield records to make adjustments in expected crop yields.</p> <p>Agency Response: The proposed language resulted from a recommendation for the Joint Legislative Audit and Review Commission (JLARC) that DCR either eliminate the provision allowing planners to adjust yields without yield records or limit its usage. However, upon further consideration, DCR finds the language to be confusing and has amended the language to eliminate the reference to adjoining soils but require that the upward adjustments impact no more than 20% of the acreage of any crop on a particular farm.</p>
147	<p>Commenter: VSDA</p> <p>Comment: Subdivision A 2 e; Use of weighted averages of soil productivities contained within fields is outdated and results in lower crop yields. State average yields are outdated. DCR should encourage the use of yield records as a way to justify higher application rates. Events such as droughts, excess rain, etc. that cause aberrations in yields downward should be disregarded in determining planning yields.</p>

	<p>Agency Response: No action concerning the regulations. Use of weighted average yields of varying soils in fields may actually result in a higher yield than using only the predominant soil. The regulations do not rely on “state average yields,” but rather on planning yields established by Virginia Tech based on soil specific yield data and soil properties. These yields were updated and included in the referenced criteria accompanying the proposed regulations. DCR does encourage farmers to keep yield data and use this data in establishing planning yields. The regulations allow the farmer to use an average of the highest three of five year’s yields for each specific field in establishing a planning yield. By dropping the two lowest yielding years, low yield aberrations are eliminated.</p>
148	<p>Commenter: John Kinch</p> <p>Comment: Subdivision A 2 f; The modification of soil sample depths from 6-8” to 0-6” for tilled fields and from 2-4” to 0-4” for fields that are not tilled will dramatically alter the results and is ill advised at this time.</p> <p>Agency Response: No action concerning the regulations. The changes to sampling depths were made: (1) to clarify that samples are not to be obtained from a single point depth, and (2) to be consistent with the Virginia Phosphorus Index technical guide.</p>
149	<p>Commenter: VTCSSES</p> <p>Comment: Subdivision A 2 f; First paragraph, change “based on grids of subfield areas” to “based on grids or management zones.”</p> <p>Agency Response: DCR concurs and has amended this section of the regulations.</p>
150	<p>Commenter: VTCSSES</p> <p>Comment: Subdivision A 2 g; A carbon analysis and a calculated C:N ratio should be included in the manure analysis.</p> <p>Agency Response: No action concerning the regulations at this time. However, DCR generally concurs that C:N information would be valuable in developing nutrient management plans that include manure, biosolids, or other organic wastes. DCR is considering the possibility of accumulating a database of C:N data for Virginia samples to evaluate the level of variability and the potential need to require C:N testing in the future.</p>
151	<p>Commenter: C. W. Williams, Henry J. Staudinger</p> <p>Comment: Subdivision A 2 g; Biosolids should be analyzed for nutrient content just prior to land application so that adjustments in rates may be calculated. Where biosolids rates are calculated for crop N needs, P and metals levels must be closely monitored to prevent a toxic level of these elements from building up in soil.</p> <p>Agency Response: No action concerning the regulations at this time. However, DCR is concerned that biosolids from the same treatment plant may vary significantly in nutrient content over time. DCR is considering working with the Department of Health’s program that reimburses local governments to monitor and test biosolids being land applied to assess variability, so that changes can be considered in the future if needed.</p>
152	<p>Commenter: VAC, AE, VAMWA, HRSD, PFRWTA, BPRC, VDACS, Synagro, SSC, Roy VanderHyde, Lewis Ashton, Lloyd Wright, Bill Henley, VSDA, VPF, VFBB, VDH, Linda Boitnott, David Hickman, Bruce Holland, NB, Arlington County Pollution Bureau, RRSA, SCWA, HCDPU, Recyc</p>

<p>Comment: Expand the nutrient application windows for organic nutrient sources. Comments ranged from requests to totally eliminate any restrictions for timing of applications to allowing somewhat more flexibility in implementing the 30 and 60-day limits ahead of planting for nutrient for application. Some expressed that nutrient sources applied to non-environmentally sensitive sites should be able to occur anytime the ground is not frozen or saturated. Some expressed that application should be allowed anytime a cover crop or grass was in place for any site while others felt a cover crop was only necessary on environmentally sensitive sites. Some stated that only the presence of crop residue should be sufficient to allow fall and winter application. Some commenters that generate or land apply sewage sludge also described the costs and operational difficulties caused by the timing requirements due to limited storage capacities and difficulties in citing field storage sites, operational and manpower limitations of compressing the spring application period to approximately two weeks, unavailability and expense of landfills as an option, and the difficulties associated with having farmers plant cover crops. Many of these same sewage sludge generators or applicators also indicated portions of the proposed regulations, if adopted, would impose major and costly impact on their members, and questioned the scientific basis of the timing restrictions indicating that the imposition of wintertime nitrogen spreading restrictions lack a scientific basis because the studies cited do not support the premise that leaching and runoff of biosolids will occur from all soils at that time of year.</p>

	<p>Agency Response: Several studies have indicated that fall and winter applications of manure or sewage sludge are particularly prone to nitrogen loss if no actively growing winter crop is present. Some of these studies are referenced in the Department of Planning and Budget’s Economic Impact Analysis of these regulations. Furthermore, the Code of Virginia recognizes this risk for manures in §62.1-44.17:1 by requiring that confined animal feeding operations have “...adequate waste storage capacity to accommodate periods when the ground is frozen or saturated, periods when land application of nutrients should not occur due to limited or nonexistent crop nutrient uptake, and periods when physical limitations prohibit the land application of waste...” DCR believes there is sufficient evidence of negative environmental impacts associated with fall and winter applications of organic nutrient sources containing nitrogen to warrant criteria to restrict improper application in nutrient management plans. In view of the costs and other difficulties presented in the comments, DCR has made several modifications to the final regulations to lessen the impacts on generators and users of manures and sewage sludges. DCR consulted with Virginia Tech faculty in developing the modified criteria. These include:</p> <ul style="list-style-type: none"> (a) On environmentally sensitive sites: Retained 30-day application limit ahead of spring planting date, but allow for up to 60 days if trap crops are established. (See (d) below); (b) For non-environmentally sensitive sites: Eliminated the need for trap crops if applied within the 60 day limit prior to spring crop planting for liquid dairy, liquid beef, all swine, all poultry, liquid sewage sludge, heat treated biosolids, and semi-solid dairy manure with sand bedding and other organic nutrient sources not listed in (c) below. Allow additional time if cover crops are planted (See (d) below). (c) For non-environmentally sensitive sites receiving lime stabilized sewage sludge, anaerobic digest sewage sludge, semi-solid dairy manure (straw or sawdust bedding), and semi-solid beef manure: Increase limit to 90 days prior to spring planting due to low ammonium nitrogen content or high carbon to nitrogen ratio of these materials. Allow additional time if cover crops are planted (See (d) below). (d) Allow applications of organic nutrient sources prior to the times listed in (a) through (c) above, provided that early planted cereal crops are established the previous fall and have reached a growth stage of 3 or more tillers per plant prior to application if amount of material applied will not smother the trap crop and at least 30 pounds of the nitrogen rate for the spring planted crop is reserved for application at the time of spring planting. If the site is environmentally sensitive, such applications to trap crops are limited to 60 days prior to planting the spring crop. (e) Changed proposed regulations in consultation with Virginia Tech Forest Resources faculty to allow for year round application of nitrogen containing materials for certain evergreen trees that are at least ten years old. For deciduous trees, no fall or early winter applications of nitrogen.
153	<p>Commenter: MSWCD, CSWCD, Richard Rash</p> <p>Comment: Manure applications should be permitted in the winter if field and environmental conditions will not prohibit use of applied nutrients. However, there must be some type of accountability when spreading outside the optimum application window. One comment indicated that application time must be reasonable to consider that larger farms need more time, while smaller farms may have labor constraints.</p>

	Agency Response: DCR partially concurs with the comment and has added both more flexibility to the timing of nutrient application requirements and included criteria to address accountability.
154	<p>Commenter: John Haile, Charles Linton, Richard Hartley, Paul Beyer</p> <p>Comment: Winter is the best time to apply biosolids. Commenters cited that winter application on pasture or hay favors fescue over crabgrass and wire grass, summer applications have hurt the fescue and even killed it due to competition by other grasses, horse boarders would not tolerate applications during the warmer periods due to odor. Other comments suggested land application to cropland was best when the land was fallow in the winter.</p> <p>Agency Response: No action concerning the regulations. Winter applications on cool season grasses like fescue is not preferable from a water quality perspective. The final criteria allows for application of organic nutrient sources on fescue hay or pasture at reduced application rates during periods of low plant uptake of nitrogen. Winter application to fallow cropland should only be done in accordance with the conditions stated in the final regulations.</p>
155	<p>Commenter: CBF</p> <p>Comment: CBF supports the proposed regulation provisions that limit application of nitrogen sources during the winter, a time when protection from nutrient loss is critical. The proposed criteria limiting winter application is scientifically supported. As stated in “Biosolids Application Timing and Soil Texture Affects Nitrogen Availability” by Evanylo and McGuinn of Virginia Tech, loss of nitrogen due to leaching and nitrogen available to crops is lower with a winter application of biosolids. The authors state, “(T)he overall recommendation is that biosolids should be applied only in the spring to ensure that the crop takes up as much biosolid-derived nitrogen as possible.” Furthermore, a Virginia Tech publication entitled “Phosphorus, Agriculture & the Environment by Dr. Greg Mullins recommends that farmers “apply phosphorus and manure to actively growing crops” and “avoid manure applications on frozen soils and during the winter when plant growth is limited and runoff potential is high.” When applied appropriately, spring applications of biosolids and other nutrient sources provide the farmer with the highest yield return per application and the greatest protection for Virginia’s waterways.</p> <p>Agency Response: DCR concurs; however, several changes were made to the timing requirements in the final regulations to lessen the impacts on generators and users of manures and sewage sludges.</p>
156	<p>Commenter: SELC</p> <p>Comment: Prohibit applications of nutrients in the winter where there are no crops to take up the nutrients.</p> <p>Agency Response: Ideally, there should be no nutrient applications during the winter without actively growing crops present. However, the amended regulations will enable applications of organic nutrient sources to be applied within specified times prior to planting spring crops based on specific characteristics of the materials that impact risk of nutrient loss.</p>
157	<p>Commenter: JRA</p> <p>Comment: The majority of nitrogen entering ground and surface waters from cropland occurs during the winter and early spring. It is critical to maintain the timing of application restrictions as they are contained in the proposed regulations.</p> <p>Agency response: DCR concurs with the comment pertaining to critical times of nitrogen loss from agricultural lands. However, several changes were made to the timing in the final regulations to lessen the impacts on generators and users of manures and sewage sludges.</p>

158	<p>Commenter: NRCS</p> <p>Comment: NRCS strongly supports DCR’s approach of not differentiating between manure and biosolids types based on N release characteristics. NRCS strongly supports the concept of allowing extra days for pre-plant spreading of N bearing materials only if the site is not environmentally sensitive and only if a good stand of an actively growing crop is in the field.</p> <p>Agency response: DCR concurs with the comment. However, several changes were made to the timing requirements in the final regulations to lessen the impacts on generators and users of manures and sewage sludges.</p>
159	<p>Commenter: Synagro</p> <p>Comment: Add a section to read “Organic materials may be applied in the fall after crop harvest at fertilizer rates suitable for the crop to be grown the following spring provided a cover or trap crop is planted by the establishment dates listed in the Virginia Nutrient Management Standards and Criteria, Revised 2005.”</p> <p>Agency response: No action concerning the regulations. It is not appropriate to apply the spring crop nitrogen need prior to seeding a fall crop. The final regulation provides for specific performance criteria to apply organic nutrient sources to a previously established trap crop, once it reaches a stage where moderate nitrogen uptake will be possible and if the trap crop will not be smothered by the applied material.</p>
160	<p>Commenter: VAC, AE, VAMWA, HRSD, PFRWTA, BPRC</p> <p>Comment: When cover crops are planted, allow nutrient applications to occur based on the spring crop needs rather than the cover crop needs.</p> <p>Agency response: The final regulations have been amended to allow applications of manure or biosolids to trap crops if certain conditions are met as specified in the final regulations. The trap crop must have reached a growth stage of 3 or more tillers per plant prior to application, the amount of material applied cannot smother the trap crop and at least 30 pounds of the nitrogen rate for the spring planted crop must be reserved for application at the time of spring planting. DCR does not concur that the full rate of nitrogen for the spring crop should be allowed to be applied to trap crops. Much of the applied nitrogen will be temporarily immobilized into the trap crop and will not be initially available to the spring crop. For agronomic crop production reasons, at least 30 pounds of nitrogen needs to be reserved for a banded starter fertilizer application at planting with at least this amount of nitrogen reduced from the application to a trap crop.</p>
161	<p>Commenter: VAMWA, HRSD, PFRWTA, BPRC, Synagro</p> <p>Comment: Replace the term “actively growing” crop with the term “existing crop” to include: (1) hay and pasture fields that provide at least 60% cover, (2) forestry sites with trees at least 2 years old, or (3) timely planted cover or trap crops as defined under the Nutrient Management Standards and Criteria document, as revised. Allow biosolids application throughout the winter provided they meet this existing crop definition or if the area is surface applied to no-till or conservation tillage areas covered under an implemented Soil and Water Conservation Plan. If the application cannot meet this criteria, allow application up to 60 days prior to planting.</p> <p>Agency response: No action concerning the regulations. DCR does not agree to replace the term “actively growing crop” with the term “existing crop.” However, the final regulations allow winter application to certain forested evergreen sites once trees reach a specified age. Application of organic nutrient sources is also allowed on cool season grass hay and pasture at reduced rates, as was contained in the proposed regulations.</p>

162	<p>Commenter: VAMWA, HRSD, PFRWTA</p> <p>Comment: Add a period to achieve compliance of three years for all biosolids application sites to allow adequate time for generators and contractors to develop appropriate alternatives to current practices for managing biosolids during the critical winter period of November 15 to March 15.</p> <p>Agency response: DCR concurs with this request, but only for non-environmentally sensitive sites. Since biosolids generators and contractors face the immediate challenge of having fewer storage options, a phase-in period (until 12/31/08) has been included in the final regulations for sewage sludge to comply with the timing requirements on non-environmentally sensitive sites. This will allow the industry time to develop alternatives such as trap crops, application to evergreen forested land, storage, and landfilling. The final regulations, however, require nutrient management plans involving land application of sewage sludge to comply with the relevant nitrogen timing requirements for applications to environmentally sensitive sites.</p>
163	<p>Commenter: Leslie Drewer</p> <p>Comment: Use of split applications of nitrogen is a good management practices.</p> <p>Agency response: No action concerning the regulations. DCR concurs.</p>
164	<p>Commenter: VTCSES</p> <p>Comment: For some non-environmentally sensitive sites (e.g., low risk sites having a combination of level, fine-textured, deep soil profile), significant runoff and leaching losses of N may not occur during winter months if an organic N source is applied as early as 90 days prior to planting. There should be some procedure/criteria to permit application to some low risk sites without a 60-day limit.</p> <p>Agency response: DCR generally concurs with this comment since certain types of organic nutrient sources do have a high carbon to nitrogen ratio or low ammonium nitrogen content. DCR consulted with appropriate faculty at Virginia Tech to determine which specific materials should qualify for the additional time for application, and made appropriate modifications to the timing requirements for organic nutrient sources.</p>
165	<p>Commenter: VTCSES</p> <p>Comment: The amount of estimated PAN from an organic source that can be applied to an actively growing cover crop which will be followed by spring seeded crop may be higher than that required for the spring seeded crop depending on the maturity of the cover crop when killed. A late killed cover crop that attains a high C:N ratio will immobilize a significant portion of the assimilated N, which will require additional spring-seeded crop N.</p>

	<p>Agency response: The final regulations have been amended to allow applications of manure or biosolids to trap crops if certain conditions are met as specified in the final regulations. The trap crop must have reached a growth stage of 3 or more tillers per plant prior to application, the amount of material applied cannot smother the trap crop and at least 30 pounds of the nitrogen rate for the spring planted crop must be reserved for application at the time of spring planting. DCR disagrees concerning the suggestion to apply more nitrogen than the spring crop nitrogen needs. However, DCR agrees that significant early spring immobilization of nitrogen may occur, requiring the application of a banded starter fertilizer nitrogen application to the spring crop at planting. Subsequent to receipt of the comment, DCR contacted appropriate faculty at Virginia Tech and reached consensus on the treatment of this issue in the final regulations. For agronomic crop production reasons, at least 30 pounds of nitrogen needs to be reserved for a banded starter fertilizer application at planting with at least this amount of nitrogen reduced from the application to a trap crop.</p>
166	<p>Commenter: VTCSES, Synagro</p> <p>Comment: A composted organic nutrient source with a C:N ratio of 25:1 or higher will actually immobilize soil N; however, as stated earlier, the C:N ratio of most properly stabilized composts will range from 12:1 to 24:1. The N annual mineralization rate of composts having these C:N ratios typically ranges from 0 (at the high ratio) to 15% (at the low ratio). These materials can be applied to most soils with little risk of N runoff and leaching. Furthermore, a compost having a C:N ratio >24:1 applied to the soil surface without incorporation will likely result in less runoff and erosion than if the material is tilled into the soil.</p> <p>Agency response: DCR concurs with much of this comment and has amended the final regulation to remove the proposed requirement for soil incorporation of the material if applied to areas with low crop residue. The C:N ratio requirement for a material to be exempt from application timing of 25:1 has been reduced to 20:1 upon the recommendation of the Virginia Department of Health and appropriate Virginia Tech faculty.</p>
167	<p>Commenter: Synagro</p> <p>Comment: Remove the requirement for a C/N ratio of 25:1 in order for composted organic nutrient sources to be exempt from the timing requirements.</p> <p>Agency response: DCR does not concur that the requirement should be removed, but has changed the C/N requirement from 25:1 to 20:1 upon the recommendation of the Virginia Department of Health and appropriate Virginia Tech faculty.</p>
168	<p>Commenter: VTCSES</p> <p>Comment: Preventing nutrient applications to snow-covered land will preclude unrisky applications of nutrient sources following a late winter/early spring snowfall of a few inches, whose persistence may be only a few days. In such cases, application of an organic nutrient source with immediate incorporation by tillage will likely pose no environmental risk but may be critical to efficient timing of agricultural operations during such times of the year.</p> <p>Agency Response: The Water Control Board’s Poultry Waste Management Regulations do not allow application of poultry waste to snow-covered ground; while the Board of Health’s Biosolids Use Regulations allow this practice for dewatered biosolids only in very limited circumstances. However, DCR disagrees with this comment if it was meant to also apply to liquid organic nutrient sources. The final regulations were amended to address these issues.</p>
169	<p>Commenter: VDH</p> <p>Comment: Allow application to snow covered or frozen ground in accordance with appropriate regulatory controls.</p>

	Agency Response: DCR concurs. After consulting with the Virginia Department of Health, the final regulations have been amended to include revised language concerning frozen and snow covered ground.
170	<p>Commenter: JRA</p> <p>Comment: Subdivision A 5 d; Research and monitoring are finding that significant atmospheric losses on nitrogen are occurring from land applied manure, sludge, and fertilizer. Some forms of this lost agricultural nitrogen is deposited on water bodies and other areas prone to runoff. Injection and incorporation of nutrient sources into the soil can reduce these losses. This needs increased consideration in DCR’s criteria.</p> <p>Agency response: No action concerning the regulations. DCR concurs that atmospheric losses of nitrogen from manures, sludges, and fertilizers is believed to be an area of increasing water quality concern among scientists. DCR had already placed a guidance statement in the proposed regulations in 4 VAC 5-15-150.D.5.d.to emphasize this issue to planners.</p>
171	<p>Commenter: NRCS</p> <p>Comment: Subdivision A 5 d; NRCS strongly encourages DCR to carefully review any elements of its regulations that require or promote the use of tillage to incorporate applied materials or increase surface roughness for runoff reduction. NRCS urges DCR to clearly direct planners to always consider the environmental tradeoff of increased sediment loss associated with tillage before recommending any tillage, particularly full width or aggressive tillage.</p> <p>Agency Response: No action concerning the regulations. DCR avoided promoting tillage in the regulations whenever possible. There are situations where tillage to incorporate nutrients can reduce nutrient loss, such as cases where there is very limited or no crop residue present. There is also a tradeoff between practices that reduce ammonia loss to the atmosphere (as discussed in the previous comment) and those that reduce soil erosion.</p>
172	<p>Commenter: VAMWA, HRSD, PFRWTA, BPRC, Synagro</p> <p>Comment: Subdivision D 2; The requirement that NMPs state a need for immediate modification should be changed to read that modifications are required before any further nutrient applications are made.</p> <p>Agency Response: DCR does not concur with this comment for all situations. However, DCR does concur with the request as it would pertain to changes in cropping systems, rotations, or fields and has amended this section of the regulations.</p>
173	<p>Commenter: VTCSES</p> <p>Comment: Subdivision D 5; Plan maintenance and revisions Due to the variability on the nutrient content of manure, we recommend an annual analysis for all manures.</p> <p>Agency Response: No action concerning the regulations. Annual analysis is to be recommended for liquid manures due to variations caused by rainfall and process wastewater use. For dry or semi-solid manures, analysis is recommended a minimum of once every three years since these materials tend to be less variable over time. Also, some poultry operations remove poultry litter from production buildings at intervals of greater than one year. DCR believes more frequent analysis should be encouraged.</p>
174	<p>Commenter: VFBF, MSWCD, Linda Boitnott, David Hickman, Bruce Holland, VFBF, Lewis Ashton, Anthony Beery, AE, VDACS, SSC</p>

	<p>Comment: Subdivision D 6; Allow the use of tissue and/or soil testing to apply above standard recommendations if subsequent testing shows a crop need.</p> <p>Agency Response: No action concerning the regulations. Several flexibilities are included in the regulations and associated criteria to accomplish this already when scientifically valid criteria exists that is verified by a land grant university research. These include the use of the pre-sidedress nitrate test in corn and use of petiole sap nitrate testing in white potatoes. Additional clarifying language has been added to Virginia Nutrient Management Standards and Criteria, Revised October 2005 concerning use of the pre-sidedress nitrate test for corn for this purpose.</p>
175	<p>Commenter: VTCSES</p> <p>Comment: Subdivision D 6; The regulations treat organic sources as though one can precisely predict the N released from the organic material, yet there is very little sampling required, i.e. one sample every three years once a baseline nutrient level is developed on a farm (which is determined by sampling once a year?). This variability of N content and release can result in over application or under application of manure nutrients with resulting crop yield loss or potential environmental contamination. Given this variability of N from the organic sources, growers should have the ability to come back, do a PSNT test and apply additional N to corn (i.e., the full side dress N requirement if needed based on the PSNT), especially if the manure applications have been made on the basis of a 1.0 lb N/bu of corn.</p> <p>Agency Response: DCR generally concurs and has amended this section of the Virginia Nutrient Management Standards and Criteria, Revised October 2005 to better describe this use of the pre-sidedress nitrate test.</p>

The Following Comments Pertain to Virginia Nutrient Management Standards and Criteria, 2005. Numbers indicate page number reference in the proposed document.

176	<p>Commenter: VPF, VSDA, NRCS</p> <p>Comment: Page 1 - Eliminate the change from 50% to 67% of the field area being required to consider the field predominantly one soil type for determination of expected yields. One commenter suggested that planners have the option of picking a single predominant soil type that best represents the field, regardless of the number of different soil types present.</p> <p>Agency Response: No action concerning the regulations. DCR believes at least two-thirds of a field needs to be represented by a single soil productivity group in order for the planner to ignore the productivity of the remainder of the field. Use of a 50% threshold for a soil type to determine yield ignores up to 50% of the remaining soils in the field. The 67% criteria also mesh better with the criteria used in determining a field as an environmentally sensitive site. The final regulations do not require a field to be designated as environmentally sensitive unless at least 33% of the field contains environmentally sensitive soils or site features. In contrast, existing previous regulations required any field to be designated as environmentally sensitive if it contained ANY amount of environmentally sensitive soils or site features. Because of the 33% allowable threshold, planners will need to determine the various soil types in at least 67% of the area of the field.</p>
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177	<p>Commenter: NRCS</p> <p>Comment: Pages 25 & 60 - NRCS supports DCR’s efforts to work with Virginia Tech to revise corn yield goals for each productivity group. Although the expected corn yields and nitrogen fertilizer recommendations have increased, the maximum fertilization rate per bushel of grain or ton of silage has decreased in some cases. The criteria should clearly state the importance of increasing use efficiency in order to meet the yields. NRCS also recommends that DCR work closely with Virginia Tech specialists to reexamine the proposed silage N fertilization rates and the grain/silage conversion equation.</p> <p>Agency Response: No action concerning the regulations. DCR contacted the Virginia Tech specialists involved in developing the corn grain to silage conversion and the nutrient application rates. They are still comfortable with the conversion and the nitrogen rates. Additional information has been added to emphasize the need for efficient applications.</p>
178	<p>Commenter: VTCSES, NRCS</p> <p>Comment: Page 26 - Table 1-3. 4. d. Since the karst belt in Virginia follows I-81 from Bristol to Winchester, this yield adjustment appears to preclude the cultivation of any row crops (e.g., corn) throughout this entire corridor. Is this the purpose of this restriction?</p> <p>Agency Response: This statement pertaining to Karst topography has been eliminated. This statement was included because it was a nutrient related recommendation contained in the Virginia Agronomic Land Use Evaluation System (VALUES) developed by the Virginia Tech Department of Crop and Soil Environmental Sciences. Since the same department is now questioning its initial purpose, DCR has removed the statement.</p>
179	<p>Commenter: NRCS</p> <p>Comment: Page 35 - Pamunkey variant is listed twice in Table 1-4.</p> <p>Agency Response: This has been corrected.</p>
180	<p>Commenter: VAMWA, HRSD, PFRWTA, BPRC, Synagro, Lloyd Wright</p> <p>Comment: Page 38 - At least one buffer requirement in the DCR regulations is not currently a part of Biosolids Use Regulations. The DCR regulation should state that buffer distances must solely conform to the existing state biosolids regulations.</p> <p>Agency Response: The one buffer distance has been corrected in Virginia Nutrient Standards & Criteria, Revised October 2005.</p>
181	<p>Commenter: NRCS</p> <p>Comment: Page 38 - Why are setback distances from environmentally sensitive features such as sinkholes and surface waters listed solely for animal waste and biosolids and not for fertilizer? NRCS considers nitrogen as likely to leach into sinkholes from commercial fertilizer sources.</p> <p>Agency Response: No action concerning the regulations. DCR began recommending setbacks for animal waste applications near environmental site features in 1989 based on USDA NRCS (formerly Soil Conservation Service) recommendations and State Water Control Board permits. The reason for the setbacks is that in addition to nutrients, manure and sewage sludge can also contain fecal coliform and other pathogens that can be a hazard to ground and surface waters. Fertilizer should be used with caution, if at all, within proximity of these site features. Proper practices for fertilizer materials are already required to be addressed in nutrient management plans, including proper timing of applications and limiting phosphorus applications to crop nutrient needs based on soil tests.</p>

<p>182</p>	<p>Commenter: VTCSES</p> <p>Comment: Page 43 - Section III. Lime Recommendations for Virginia Crops (Except Commercial Turf, Surface-Mined Area Crops, Greenhouse, and Nursery Production). We recommend that the tables using soil pH and Soil Type (Pages 43-44) to estimate lime recommendations be deleted! The Virginia Tech Soil Testing Laboratory will be adopting the Mehlich buffer method to determine lime recommendations in September 2005. The reason for this adoption is that the Tables listed on pages 43 and 44 give a “qualitative” estimate of lime needs. Buffer methods have been proven to be the best, science-based method of determining exchangeable/reserve acidity in soils and lime needs. In addition, all commercial soil testing laboratories use accepted buffer methods. The lime recommendations provided by the respective laboratory should be used instead of the Tables listed on Pages 43-44. Question, if the lime recommendation from a soil-testing laboratory is not going to be used in writing a plan, why should a producer pay for this determination?</p>
	<p>Agency Response: DCR concurs and has amended the lime tables and procedures in Virginia Nutrient Management Standards & Criteria, Revised October 2005. At the time the proposed regulations were being developed, the Virginia Tech soil-testing laboratory was using the tables previously included. Virginia Tech did not announce the change to the Mehlich buffer procedure or provide any criteria for its interpretation until September 1, 2005. Changes to the criteria in the final regulation now include the table to determine not only lime applications based on Mehlich buffer pH procedure run by the Virginia Tech Soil testing laboratory but also the SMP buffer pH test used by most other department approved private laboratories. This information is provided in the event that lime recommendations are not included with the soil reports, or if the planned crop for a field is changed to a crop that requires a different soil pH. Lime recommendations provided by the department approved soil testing laboratories are acceptable for use in nutrient management plans as well.</p>
<p>183</p>	<p>Commenter: Gerald Garber</p> <p>Comment: Page 59 - Potassium recommendations are too low for my silage rotations. My soil test levels have dropped to the extent that I have to add potassium to my dairy feed.</p> <p>Agency Response: DCR concurs. After contacting the producer, who agreed to share sequential soil sample results from a number of fields, DCR worked with Virginia Tech specialists who agreed that the Virginia Tech potassium recommendations should be increased for corn silage. Phosphorus soil test recommendations for corn silage were also increased. These changes have been incorporated into Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>
<p>184</p>	<p>Commenter: VSDA</p> <p>Comment: Page 61 - The pre-sidedress nitrate test should factor in other factors other than rainfall events, such as cool weather, immobilization from cover crops, and variability of application of organic wastes to trigger the use of the test.</p> <p>Agency Response: DCR generally concurs and has provided broader language to cover some of the suggestions in this comment.</p>
<p>185</p>	<p>Commenter: VPF</p> <p>Comment: Page 61 - Eliminate the changes proposed by additional prescriptive use of the pre-sidedress nitrate test for corn.</p>

	<p>Agency Response: The addition of the second listed option for use the pre-sidedress nitrate test was intended to provide more flexibility for producers to make nutrient adjustments due to severe weather conditions. This option has been retained and broadened to include situations where organic nutrient sources do not mineralize nitrogen as rapidly as expected due to cool weather or other factors.</p>
186	<p>Commenter: VTCSES, NRCS</p> <p>Comment: Page 61 - Use of The PSNT Test on Corn: We have some concerns with the second option: Adjustment of Nitrogen Sidedress Recommendations Considering Extreme Weather (Page 62). What is the scientific basis for these recommendations? We are not aware of any faculty at Virginia Tech that were consulted in developing these recommendations. This additional guidance on the use of the pre-sidedress nitrate test (PSNT) should be reviewed with Virginia Tech experts.</p> <p>Agency Response: The addition of the second listed option for use the pre-sidedress nitrate test was intended to provide more flexibility for producers to make nutrient adjustments due to severe weather conditions. It was developed based on the experiences of several active certified planners contacted by DCR. Following receipt of this comment, DCR contacted the relevant specialists at Virginia Tech. A minor change was made in the lowest category of soil nitrate levels for the second option. The specialists subsequently expressed support for the amended option.</p>
187	<p>Commenter: Lynton Land</p> <p>Comment: Page 63 - Nitrogen recommendations for legumes that fix their own nitrogen from the atmosphere, such as soybeans, should be zero, as they are for red clover.</p> <p>Agency Response: No action concerning the regulations. The nitrogen recommendation for soybeans has been intentionally excluded so as not be in conflict with Biosolids Use Regulations. While the application of organic nutrient sources to legumes like soybeans and alfalfa is not a value added use of nitrogen, there is scientific evidence that the plants will preferentially uptake available nitrogen in the soil before the fixation of atmospheric nitrogen occurs.</p>
188	<p>Commenter: NRCS</p> <p>Comment: 66 - DCR should consult with Virginia Tech to confirm that the small grain silage recommendations for rye, wheat and barley are correct relative to each other.</p> <p>Agency Response: No action concerning the regulations. DCR again contacted the appropriate faculty at Virginia Tech and they still concur with the recommendations.</p>
189	<p>Commenter: C. W. Williams</p> <p>Comment: Pages 82 & 107 - Excess nitrates on cropland can result in groundwater contamination. Nitrate nitrogen at levels greater than 10 ppm in drinking water is causative of methemoglobinemia in infants. High concentrations of nitrates in forage can cause death of livestock. According to a paper entitled "Risk of Toxic Nitrate Accumulation in Forages Grown on Biosolids-amended Soils." Crop and Soil Environmental News, Virginia Cooperative Extension, September 2002, by Dr. Greg Evanylo of Virginia Tech, biosolids MAY pose a greater risk of nitrate toxicity than commercial fertilizer because: biosolids are often applied to pastures and hay lands at rates calculated to supply nitrogen for an entire growing year; recently established mineralization rates are higher than previously thought; and variability in N concentration in biosolids may result in higher than expected levels of nitrates.</p>

	<p>Agency Response: No additional action concerning the regulations. The forage crop recommendations from Virginia Tech pertaining to fertilizers often recommend multiple applications of nitrogen during the active growing season based on the number of hay cuttings. In dry years, the number of hay cuttings may be reduced; so total nitrogen rates for the year may be less due to fewer applications. With organic nutrient sources, some of the applied nitrogen must convert to plant available inorganic forms of nitrogen (ammonium nitrogen or nitrate nitrogen) before being capable of utilization by plants. The practice has been to allow for application of the total nitrogen needs for the year, if the application is made in the spring through early summer. In a drought year, this could result in over application relative to crop needs because of fewer hay cuttings. Two provisions are included in the final regulations to reduce the concerns stated in the comment. First, organic nutrient source nitrogen applications to cool season grass hay or pasture must be reduced by 50% if the application is to occur after September 1 or before March 1 to account for reduced crop uptake during the remainder of the growing season and during the winter. Secondly, changes in the mineralization rates for certain types of biosolids were made based on Dr. Evanylo’s recommendation. DCR believes that potential nitrate accumulation in forages needs to be monitored before considering additional changes.</p>
190	<p>Commenter: VAMWA, HRSD, PFRWTA, BPRC</p> <p>Comment: Pages 88 – 89 - It is our understanding that DCR did not consult with forestry scientists at Virginia Tech in developing certain application rates for forestry rotations. Biosolids application rates and potential nutrient losses are currently being studied by the Forest Fertilization Cooperative. Results of this study should be evaluated before forestry rates are established by DCR. Application rates should be consistent with rates recommended by the Virginia Department of Forestry until Virginia Tech researchers recommend otherwise.</p> <p>Agency Response: DCR used Virginia Tech recommendations for the forestry application rates contained in the proposed regulations, except for one situation. These were taken from “Soil Test Recommendations for Virginia” by Dr. S.J. Donohue and S.E. Heckendorn. The one deviation was for one-time applications of biosolids to existing forest stands, for which DCR used what are believed to be rate limitations in several current biosolids use permits issued by the Department of Health. Following receipt of this comment, DCR consulted with appropriate faculty at the Virginia Tech Department of Forestry. As a result, several of the rates and practices have been modified for forested land in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>
191	<p>Commenter: Jerre L. Creighton, Dr. Tom Fox, Synagro</p> <p>Comment: Pages 88 – 89 - The nutrient application rates and practices for forests need several modifications. Please consult with Dr. Tom Fox at the Forest Nutrition Cooperative located at Virginia Tech to refine the criteria for forest nutrient application. (Some commenters had a number of specific suggestions for various tree species and application rates and intervals.)</p>

	<p>Agency Response: DCR used Virginia Tech recommendations for the forestry application rates contained in the proposed regulations, except for one situation. These were taken from “Soil Test Recommendations for Virginia” by Dr. S.J. Donohue and S.E. Heckendorn. The one deviation was for one-time applications of biosolids to existing forest stands, for which DCR used what are believed to be rate limitations in several current biosolids use permits issued by the Department of Health. Following receipt of this comment, DCR consulted with appropriate faculty at the Virginia Tech Department of Forestry. As a result, several of the rates and practices have been modified for forested land in Virginia Nutrient Management Standards and Criteria, Revised October 2005.</p>
192	<p>Commenter: VAC, Steve Glass, Paul J. Hartzell, Irvin L. Hoyt, Jr., Tony Rinaldi, Jeff Yarborough, John Parrish, Michael Litton, Scot Lilly, Rob Wilmans, Ronald W. Barley, Jeff Whitmire, Rick Grant, Marc. M. Petrus, Charlie Fultz, Mark Vaughn, Eric Spurlock, Rick Grant, Christian Sain</p>
	<p>Comment: Pages 91 – 97 - Revise turfgrass recommendations to reflect current research. Please consult Virginia Tech researchers, the Virginia Turfgrass Council, and others for appropriate nitrogen rates for turf. Recommendations need to include flexibility to address more scenarios than listed in current criteria, such as establishment, re-establishment, adverse weather and various soil types. Some commenters stated the regulations are not specific enough in differentiating between warm and cool season grasses, maintenance vs. establishment N rates, or accounting for climate differences across the state.</p>
	<p>Agency response: DCR concurs. Following receipt of the comments, DCR worked with Virginia Tech faculty and the Virginia Turfgrass Council to revise the criteria to be more prescriptive in addressing more specific turfgrass land use categories, more types of grass, and climatic variations throughout Virginia.</p>
193	<p>Commenter: Ken Thompson</p>
	<p>Comment: Pages 91 – 97 - UMAXX fertilizer is not addressed by regulations.</p>
	<p>Agency Response: No action concerning the regulations. Definitions for “slowly available nitrogen” vs. “stabilized” nitrogen are quite different based on the definitions given by the Association of American Plant Food Control Officials. These products do have significantly different characteristics. “Slowly available nitrogen” products such as methylene urea can contain 25 - 60% cold water insoluble nitrogen or sulfur coated ureas, with and without a wax coating and may provide a turf response up to 16 weeks with one application. “Stabilized” urea products have a shorter expected release period. These stabilized products will still be considered to be used at rates based on water-soluble criteria.</p>
194	<p>Commenter: Ronald W. Barley, Jeff Whitmire, Rick Grant, Marc M. Petrus, Paul J. Hartzell, Eric Spurlock, Steve Glass, Christian Sain</p>
	<p>Comment: Page 95 - Nitrogen levels too low for fairways and roughs.</p>
	<p>Agency response: The nitrogen recommendations for fairways and roughs in proposed regulations were taken directly from the Virginia Tech Publication “Nutrient Management of Golf Courses.” This publication was posted to the Virginia Tech website in June 2004. However, following receipt of the comments, DCR worked with Virginia Tech faculty and the Virginia Turfgrass Council to revise the criteria to be more prescriptive and allow higher rates of application if small efficiently timed single applications or slowly available forms of nitrogen are used.</p>

195	<p>Commenter: Charlie Fultz</p> <p>Comment: Page 95 - Golf course managers commonly apply 1 to 1.5 pounds of nitrogen per 1,000 square feet as a dormant application to greens, tees, and fairways in the winter. If this amount of N counts toward the yearly total N allowed, then the regulations are too restrictive.</p> <p>Agency response: No action concerning the regulations. It is not appropriate to apply this level of nitrogen to dormant grass in the winter since this is a period of low or no uptake of nitrogen, and a time of greatest potential leaching loss to groundwater. Alternatively, if warm season grasses are overseeded with perennial ryegrass in the fall, the criteria in Virginia Nutrient Management Standards and Criteria, Revised October 2005 does allow for small nitrogen applications to occur during fall and winter.</p>
196	<p>Commenter: VTCSES</p> <p>Comment: Page 98 - The N availability from red clover (should actually be for red and crimson) and hairy vetch should indicate that these are under conditions when the crops are use as cover crops.</p> <p>Agency Response: DCR concurs with the addition of crimson clover and has added the word “cover” after hairy vetch in the Virginia Nutrient Management Standards and Criteria, Revised October 2005. However, we do not believe the legume credits are excessive for the clovers even if they had been existing hay crops rather than cover crops, since a reduction of the credit is based on final stand density.</p>
197	<p>Commenter: Lynton Land</p> <p>Comment: Pages 99 & 107 - Nutrient management plans should account for all nitrogen applied from organic nutrient sources. Current regulations ignore almost half of all organic nitrogen by not requiring 100% of the organic nitrogen to be attributed to crop needs.</p> <p>Agency Response: No action concerning the regulations. Because of various factors influencing the conversion of organic nitrogen forms to inorganic forms of nitrogen taken up by plants (ammonium nitrogen and nitrate nitrogen), the total organic nitrogen content of manure and sewage sludge is not 100% accounted for in nutrient management plans. Some of the nitrogen is contained in organic molecules that are fairly stable in soils and resistant to decomposition. Also, there is variability in the actual carbon to nitrogen ratio of materials and variability in weather conditions that influence conversion of the organic nitrogen. Because of these variables, it is not practical to account for 100% of the organic nitrogen in manure and sewages sludge in agronomic systems. However, because of this inherent variability, it is likely that potential nitrogen loss impacts to the environment from application of manure and sewage sludge is greater than with properly timed inorganic nitrogen applications. Use of better nutrient analysis techniques in the future such as carbon to nitrogen ratio testing of materials may improve the situation somewhat, but will not be a total cure.</p>
198	<p>Commenter: Synagro</p> <p>Comment: Page 107 - The mineralization rate for anaerobic digested sludge does not conform to VDH or DEQ regulations, which specify a mineralization rate of 0.20. DCR does not have the authority to alter or supercede the state biosolids regulations.</p> <p>Agency Response: No action concerning the regulations. The changes in mineralization rates are based on recommendations from Virginia Tech faculty and have been discussed with the Virginia Department of Health. DCR has the authority to specify criteria for the development of nutrient management plans and to include sewage sludge mineralization rates.</p>

199	<p>Commenter: VTCSES</p> <p>Comment: Page 107 - If an environmental threshold approach to phosphorus management is ever adopted as the sole phosphorus approach (i.e., the phosphorus index option is eliminated), the 100% plant available assumption should not be applied to the environmental threshold approach. Version 1.3 of the Virginia Phosphorus Index accounts for such differences in P “solubility” among various types of biosolids by the use of a “P source coefficient.”</p> <p>Agency Response: No action concerning the regulations. The regulations do not offer the environmental threshold approach as the only option. The regulations include the use of the phosphorus index as an optional method for determining application rate of phosphorus. The phosphorus index already includes various phosphorus source coefficients for the purpose of determining runoff factors for various categories of nutrient sources. Regardless of the method selected by the planner to determine allowable phosphorus application rate, all of the phosphorus contained in nutrient sources must be 100% accounted for in actual application rate applied.</p>
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Commenter Abbreviations

Abbreviation	Organization	Name	Title	Location
AE	Virginia Cooperative Extension, Accomack County	James N. Belote, III	Senior Extension Agent	Accomac, Virginia
BRPC	Blue Plains Regional Committee, Fairfax County	Jimmie Jenkins	Regional Committee Chairman	Washington, D.C.
CBF	Chesapeake Bay Foundation	Ann F. Jennings	Virginia Executive Director	Richmond, Virginia
CSWCD	Culpeper Soil and Water Conservation District	Monira Rifaat	Chair Elect	Culpeper, Virginia
ESSWCD	Eastern Shore Soil and Water Conservation District	Robin Rich-Coates	Chair	Accomac, Virginia
		Richard F. Hall, III	Vice-chair	
FC	Farm Credit	Patti R. Craun	Relationship Manager – Dairy Specialist	Harrisonburg, Virginia
HCDPU	Henrico County, Department of Public Utilities	Arthur D. Petrini, P.E.	Director of Public Utilities	Richmond, Virginia
HRSD	Hampton Roads Sanitation District	Rhonda L. Bowen	Recycling Manager	Virginia Beach, Virginia
HSWCD	Headwaters Soil and Water Conservation District	Rick Shiflet	Director	Verona, Virginia
JRA	James River Association	William H. Street	Executive Director	Mechanicsville, Virginia
MSWCD	Monacan Soil and Water Conservation District	Keith Burgess	District Manager/ Conservation Specialist	Goochland, Virginia

NB	Nutri-Blend, Inc.	J. Simmons	President	Richmond, Virginia
NRCS	U.S. Department of Agriculture, Natural Resources Conservation Service	M. Denise Doetzer	State Conservationist	Richmond, Virginia
PFRWTA	Pepper's Ferry Regional Wastewater Treatment Authority	R. Clarke Wallcraft	Executive Director	Radford, Virginia
POSWCD	Peaks of Otter Soil and Water Conservation District	Richard P. Chaffin	Director	Bedford, Virginia
RRSA	Harrisonburg - Rockingham Regional Sewage Authority	Curtis Poe	Executive Director	Harrisonburg, Virginia
SCC	Southern States Cooperative, Inc.	James R. Erickson	Director – Corporate Communications, Member Relations and Public Affairs	Richmond, Virginia
SCWA	South Central Wastewater Authority	James C. Dawson, P.E.	Assistant Executive Director	Petersburg, Virginia
SELC	Southern Environmental Law Center	Katherine E. Slaughter	Senior Attorney	Charlottesville, Virginia
TFI	The Fertilizer Institute	William C. Hertz Tom Bruulsema	Director, Scientific Programs Director, Northeast Region Potash and Phosphate Institute	Washington, D.C.
VAC	Virginia Agribusiness Council	Katie Kyger	Assistant Vice President, Public Affairs	Richmond, Virginia
VAMWA	Virginia Association of Municipal Wastewater Authorities	Karen Pallansch	Chair, VAMWA Biosolids Committee	Richmond, Virginia
VCGA	Virginia Corn Growers Association	Ellen M/ Davis	Executive Director	West Point, Virginia
VDACS	Virginia Department of Agriculture and Consumer Services	J. Carlton Courter, III	Commissioner	Richmond, Virginia
VDH	Virginia Department of Health, Division of Wastewater Engineering	Cal Sawyer, P.E.	Director, Division of Wastewater Engineering	Richmond, Virginia
VFBF	Virginia Farm Bureau Federation	Wilmer N. Stoneman, III	Associate Director, Governmental Relations	Richmond, Virginia
VPF	Virginia Poultry Federation	Hobey Bauhan	President	Harrisonburg, Virginia

VSA	Virginia Soybean Association	Richard S. Atkinson	Executive Director	Williamsburg, Virginia
VSDA	Virginia State Dairyman's Association	Dale A. Gardner	Executive Secretary – Treasurer	Harrisonburg, Virginia
VSGA	Virginia Small Grains Association	Ellen M/ Davis	Executive Director	West Point, Virginia
VTCSES	Virginia Tech Crop and Soil Environmental Scientists	Greg Mullins	Professor and Nutrient Management Specialist	Blacksburg, Virginia
		Greg Evanylo	Professor and Extension Specialist	
		M.M. Alley	W.G. Wysor Professor	
		Lucian Zelazny	T.B. Hutcheson Professor, CSES	
		W. Lee Daniels	Professor, CSES	
VTPIT	Virginia Tech Phosphorus Index Team	Greg Mullins	Professor and Nutrient Management Specialist, CSES	Blacksburg, Virginia
		Mary Leigh Wolfe	Associate Professor, BSE	
		W. Lee Daniels	Professor, CSES	
		Lucian Zelazny	T.B. Hutcheson Professor, CSES	
		Jim Pease	Professor, AAE	

All changes made in this regulatory action

Please detail all changes that are being proposed and the consequences of the proposed changes. Detail new provisions and/or all changes to existing sections.

Current section number	Proposed new section number, if applicable	Current requirement	Proposed change and rationale
4 VAC 5-15-10			Add definitions for: cereal crop, composted organic nutrient source, Mehlich III, no-till, phosphorus index, phosphorus saturation level, RUSLE2, tilled, and trap crop. These

			<p>additional terms are referenced in the revised final regulations.</p> <p>Modify definitions for: certified nutrient management planner, cool season grass, crop nutrient needs, crop nutrient removal, environmentally sensitive site, organic nutrient source, Mehlich I, nutrient management plan, pre-sidedress nitrate test, residual nutrients, slowly available nitrogen, soil erosion, soil series, soil survey, and water insoluble nitrogen. The definitions for these terms are modified for technical or clarification reasons.</p>
4 VAC 5-15-40		To be eligible for certification: Requires degree college degree with a major in an agriculturally related area and one year of practical experience related to nutrient management planning; or a combination of nutrient management educational courses or training and three years of practical experience related to nutrient management.	<p>Adds stipulation that degree in agriculturally related area must have included coursework in the area of nutrient management such as soils, soil fertility and plant science. This change insures that there is some education in nutrient management topics and allows the department to consider a broader range of degree programs as related to agriculture (examples: biology, geology) if some coursework was taken that is directly relevant to nutrient management.</p> <p>Adds ability to consider implementation of nutrient management concepts and principles in lieu of nutrient management planning experience. This change allows the department to accept a broader range of experience backgrounds.</p>
4 VAC 5-15-60		Applicants for certification shall achieve a passing score on each of the essential components of the nutrient management examination...	<p>Strike "essential components" and add "parts." This change is needed for clarification that the exam is divided into two or more parts that are scored individually, not 10 parts pertaining to each major knowledge area.</p> <p>The knowledge area numbered as 10 is amended to include timing of nitrogen applications and phosphorus nutrient management planning and assessment techniques. This change reflects increased emphasis on these issues in the amended regulation.</p>
4 VAC 5-15-80	5		Requires persons certified prior to the effective date of the amended regulation to attend a specific additional training course to maintain certification. This change is needed to familiarize these persons with significant changes in criteria, particularly relating to phosphorus management.
4 VAC 5-15-		Requires reporting of	Requires reporting of acreage of plans for

<p>100 A</p> <p>B 1</p> <p>B 2 f</p>	<p>C</p>	<p>acreage of plans for various land uses by county and watershed codes.</p> <p>Requires certified planners to make plans available for inspection by Department personnel upon request within 2 weeks.</p> <p>Requires certain organic nutrient source parameters to be analyzed.</p>	<p>various land uses specified as new or revised acres by county and watershed codes. This change is needed for departmental reporting of nutrient reduction progress to the Chesapeake Bay Program.</p> <p>Requires certified planners to make plans available for inspection by Department personnel upon request within 1 week. This change expedites the provision of plans to Department personnel upon inspection.</p> <p>Adds ammonium nitrogen to the list of parameters to be analyzed. This parameter is required to determine appropriate application rates.</p> <p>Added a subsection C to require that certified nutrient management planners provide the department with a copy of modified nutrient management plans within two weeks following modification of any plan pursuant to relevant sewage sludge, animal waste, or poultry waste permits. 4 VAC 5-15-110 included a provision allowing the department to take disciplinary action if a certified planner failed to provide the department a copy of modified nutrient management plans within two weeks following modification of any plan pursuant to relevant sewage sludge, animal waste, or poultry waste permits. This modification is required for technical accuracy of the regulation, since a companion requirement already existed in proposed 4 VAC 5-15-110 relating to recordkeeping and reporting requirements. The department intends to give certified planners some discretion in modifying existing plans without prior agency approval.</p>
<p>4 VAC 5-15-110</p>	<p>6</p>		<p>Adds to the department's authority to revoke, suspend or deny certification if a planner modifies or revises a plan so that it does not comply with the regulations. Also adds a requirement that the department must be provided a copy of certain modified nutrient management plans required by permits. These changes are necessary because the department is contemplating allowing certified planners to make certain plan modifications within the specified life of nutrient management plans for permitted operations without prior approval of the department.</p>

4 VAC 5-15-130		Relates to duties of other state agencies.	This section is stricken because it is unnecessary.
4 VAC 5-15-140 A		Requires name and certificate number of certified planner	Requires name, certification number, and signature of the certified planner that prepared the plan. This change is needed for additional accountability and problems encountered when computerized files specific to a plan have been shared by two or more certified planners.
4 VAC 5-15-140 C			Adds several elements to features that must be indicated on maps contained in nutrient management plans. Some of these changes are necessary due to document plan features related to phosphorus management changes in 4 VAC 5-15-150. Other additions were recommended by a JLARC study entitled "Review of Nutrient Management Planning in Virginia."
4 VAC 5-15-140 D 9		Soil incorporation times for organic nutrient sources.	Strike "days for" and insert "time of." This change is made for improved clarity.
4 VAC 5-15-140 D	11		Adds a requirement to include numerical phosphorus and potassium soil analysis results for all fields in the plan. This change is necessary to provide for inputs to the phosphorus management procedures in 4 VAC 5-15-150 and so the department can confirm compliance with the regulations during plan reviews.
4VAC 5-15-140 F 5		Liming recommendations.	Adds the phrase "or to raise soil pH to no more than the upper limit for lime stabilized sewage sludge." Allows lime to be recommended at soil pH levels slightly higher than optimal pH for crops, but at controlled rates.
4 VAC 5-15-140 E	9 10	Plans must contain information about the length of time the plan is effective, not to exceed five years from the date the plan is developed.	Strikes "not to exceed five years from the date the plan is developed" and adds "consistent with 4 VAC 5-15-150 D 1". This changes is needed for internal consistency. Adds a new subsection specifying additional plan content items if the phosphorus index is used to derive allowable phosphorus application rates. This change is needed to confirm farmer compliance with nutrient management plans and certified planner compliance with the regulation. Renumbers previous subsection 9 as revised subsection 10.
4 VAC 5-15-140 G		Recommends that planners incorporate	Requires that planners incorporate additional more restrictive plan

		additional plan requirements as appropriate if required by other specific regulatory or incentive programs that apply to a specific operator.	requirements if required by other specific legislative, regulatory or incentive programs that apply to a specific operator. This change is needed to improve the quality of plans developed by certified planners if specific laws, regulations or incentive programs require more stringent plan criteria and/or content.
4 VAC 5-15-150 (multiple sub-divisions)		All references to Virginia Nutrient Management Standards and Criteria, Revised November 1995 and Commercial Vegetable Production Recommendations, 1995.	Cites later revisions to documents as Virginia Nutrient Management Standards and Criteria, Revised October 2005 and Commercial Vegetable Production Recommendations, 2005. The most current versions of the documents are cited. This change is needed since these documents have been updated. Virginia Nutrient Management Standards and Criteria document was revised to include: new instructions including the use of predominant soils in fields, addition of more soil names, revised crop yields, additional crops, revised "environmentally sensitive site" designation procedures, revised setback tables, revised soil analysis laboratory conversion equations and tables, addition of pH tables and calibrations for various procedures, various phosphorus management criteria and procedures, revised crop nutrient needs tables, addition of forest crop nutrient criteria, expanded turf nutrient criteria, revised manure average values, revised biosolids mineralization rates, and other changes.
4 VAC 5-15-150 A 1 2 b & c		Potential nutrient sources to be considered in plans are listed. Phosphorus application rates should be managed to reduce water quality impacts. Additional planning considerations are described to help achieve this recommendation.	The term "industrial wastes" is added to the list of potential nutrient sources. This is necessary because certain industrial wastes that contain significant nutrient levels are land applied in Virginia. Phosphorus application rates shall be managed to minimize adverse water quality impacts. Specific procedures are prescribed to determine allowable phosphorus application rates in nutrient management plans. This is necessary to meet requirements in § 62.1-44.17:1.1 of the Code of Virginia, 40 CFR Parts 9, 122, 123 and 412 as published in the Federal Register Volume 68, No. 29, dated February 12, 2003, and 9 VAC 25-191 and 9 VAC 25-192 of the Virginia Administrative Code, and due to scientific advances in understanding of phosphorus management and water quality impacts.

2 d		<p>Recommended application rates for potassium, secondary nutrients, and micronutrients should be at agronomically or economically justifiable levels for expected crop production.</p>	<p>Requires that potassium applications be consistent with the Virginia Nutrient Management Standards and Criteria document that is incorporated by reference. This change was suggested during the NOIRA comment period to insure that deficiencies of other nutrients do not limit crop uptake of nitrogen and phosphorus that may be applied at maximum allowable rates.</p>
2 e		<p>Allows for planner discretion to make reasonable yield adjustments on up to 20% of fields with no yield records.</p>	<p>Inserts language to require that the 20% limit applies to “acreage of any crop” rather than 20% of the number of fields. This modification affords planners and farmers flexibility and discretion in making planning yield adjustments without records, while still addressing the JLARC recommendation (contained in A Review of Nutrient Management Planning in Virginia) to either eliminate this provision or limit its applicability.</p>
2 f		<p>Requires methods for phosphorus soil analysis approved by the department and specifies sampling depths in fields.</p>	<p>Adds a requirement for the department to approve laboratories as well as methods based on statistical correlation with the Mehlich I procedure. Also amends and clarifies soil sampling depths. Enables use of subfield grids or management zones for soil sampling. These changes are necessary due to more specific requirements for phosphorus based nutrient management planning. They also provide more flexibility to farmers and planners to make discretionary use of precision agriculture technologies to refine nutrient application.</p>
2 g		<p>Describes how to use organic nutrient source analyses in developing nutrient management plans.</p>	<p>Adds further specificity to the use of past manure analysis values for existing operations and clarifies methods to use to project nutrient analysis values for new operations. This change is needed for clarification and consistency of analysis methods.</p>
2 h		<p>Describes how to credit the expected nitrogen credits from legumes in the crop rotation contained in nutrient management plans.</p>	<p>Strikes the phrase “which substantially conform to those.” This change is necessary to eliminate ambiguity.</p>
3		<p>Describes the influence of</p>	<p>Adds requirements that nutrient</p>

		<p>soil pH on nutrient availability and recommends that pH be adjusted to the level suitable for the crop.</p>	<p>management plans more precisely address the need to maintain soil pH in appropriate ranges. This change is needed since departmental reviews of nutrient management plans have identified instances where and soil pH has been well outside of appropriate agronomic ranges for crops.</p>
<p>4 a</p>		<p>Requires all nutrient applications to be made no more than 30 days prior to planting an agronomically feasible crop. An exception exists that organic nutrient sources may be applied if necessary between December 21 and March 16 if specified conditions are met.</p>	<p>Changes the requirements pertaining to timing of application to apply to nitrogen containing nutrient sources only, not all nutrients. Requires application to occur no more than 30 days prior to the timely planting of a crop except as specified in subsection b through e. This change is necessary to recognize that timing of application is more critical for nitrogen than other nutrients and that leaching losses of nitrogen can occur in the winter.</p>
<p>4 b</p>			<p>Redefines existing regulation section b as amended section e. Inserts new subsection b. that specifies: (1) applications of certain types of materials (poultry manure, swine manure, liquid dairy manure, semi-solid dairy manure with sand bedding, heat treated sludge, liquid sludge and all other organic nutrient sources not listed in (2) below) shall be within 60 days of planting a spring seeded crop to sites that are not environmentally sensitive sites as identified in 4 VAC 5-15-10 or the Virginia Nutrient Management Standards and Criteria, Revised October 2005. (These materials contain significant ammonium form of nitrogen or have a relatively low carbon/nitrogen ratio that results in more rapid transformation of nitrogen to the nitrate form that is most susceptible to loss through runoff or leaching.)</p> <p>(2) Applications of specified types of materials (semi-solid beef manure, semi-solid dairy manure with sawdust bedding or straw bedding, dewatered anaerobically digested sewage sludge, or dewatered lime stabilized sewage sludge) may be within 90 days of planting a spring seeded crop to sites that (a) are not environmentally sensitive sites as identified in 4 VAC 5-15-10 or the Virginia Nutrient Management Standards and Criteria, Revised October 2005, and (b) if slopes of any part of the application area are 7% or greater, the site</p>

		<p>must have at least 60 percent uniformly distributed crop residue ground cover or the application and ant associated tillage is in conformance with an existing and implemented soil conservation plan meeting NRCS requirements for the site. (These materials contain relatively little amounts of ammonium nitrogen and/or have a relatively high carbon/nitrogen ratio that results in slower transformation of nitrogen to the nitrate form that is most susceptible to runoff or leaching.)</p> <p>(3) Adds a new provision allowing organic nutrient source application prior to the times specified in (1) and (2) above on: (a) sites that are not environmentally sensitive sites if trap crops exist on the site meeting performance criteria:</p> <p>(i) a trap crop exists that has reached a Zadoks growth stage of 23 or greater having a uniform stand throughout the site area of at least 20 plants per square foot;</p> <p>(ii) the trap crop shall be allowed to continue growing on the entire site until within two weeks of the spring crop planting date;</p> <p>(iii) all such nitrogen applications of organic nutrient sources to cereal trap crops shall not exceed the crop nutrient needs of the upcoming spring planted crop subtracting at least 30 pounds per acre of nitrogen to be reserved for use as a banded starter fertilizer at the time of spring planting;</p> <p>(iv) and the rate of organic nutrient source applied does not smother the trap crop;</p> <p>(b) environmentally sensitive sites as identified in 4 VAC 5 -15-10 or the Virginia Nutrient Management Standards and Criteria, Revised October 2005 if conditions in (a) (i) through (iv) above are met and such applications to a trap crop must be within 60 days of planting a spring planted crop. (This provision provides additional flexibility to use well established trap crops to uptake nitrogen applied in organic nutrient sources during the late fall and winter so that runoff and leaching is reduced. It is important that care be taken not to apply so much material that the trap crop would be smothered. If the trap crop is killed at the proper stage of growth in the spring, nutrients will be released to the spring planted crop. To allow for sufficient immediately available nitrogen at the time</p>
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	<p>4 VAC 5-15-150 A 4 c</p>		<p>of crop emergence of the spring planted crop, it is necessary to withhold at least 30 pounds of nitrogen from the trap crop application to be reserved for a banded starter fertilizer application to be applied when planting the spring crop.)</p> <p>Existing regulation section 4 c is amended as section 4 e. Inserts a new provision allowing a delayed implementation schedule for certain application timing requirements contained in 4 VAC 5-15-150 A 4 a and b for sewage sludge applications to non-environmentally sensitive sites. Requires sewage sludge applications in plans to fully comply with 4 VAC 5-15-150 A 4 a and b effective January 1, 2009. Adequate fall and winter storage capacity is lacking at a number of sewage sludge generation facilities. The implementation delay for contained in this provision will allow the sewage sludge land appliers additional time to develop alternatives such as trap crops, application to evergreen forested land, application to cool season grass hay and pasture, storage, and landfilling.</p>
	<p>4 VAC 5-15-150 A 4 d</p>		<p>Exempts composted organic nutrient sources having a final carbon to nitrogen ratio of 20:1 or greater from requirements a. and b. of this subsection if analyzed for carbon to nitrogen ratio at the conclusion of the composting process and results are obtained prior to land application. The planner shall recommend soil nitrate testing to determine nitrogen application rates during the growing season following the application of composted organic nutrient sources.</p> <p>A carbon to nitrogen ratio of at least 20:1 is sufficient to greatly limit the rate of mineralization of organic nitrogen to plant available forms of nitrogen and those forms most susceptible to environmental loss.</p>
	<p>4 VAC 5-15-150 A 4 e</p>	<p>Existing regulation subsection 4 b requires planners to recommend split applications of nitrogen in specified situations.</p>	<p>Redefines existing regulation subsection b. as amended new subsection e. Strikes the word "additional" to clarify that the pre-sidedress nitrogen test may sometimes result in no additional need for nitrogen. References "environmentally sensitive sites" and adds language to create an</p>

	<p>4 VAC 5-15-150 A 4 f</p>	<p>Existing regulation subsection 4 c specifies that nutrient application to frozen or snow covered ground should be avoided and provides criteria for selection of fields for application if emergency situations develop.</p>	<p>exception to split application requirements for inorganic nitrogen fertilizers if at least 50% of the nitrogen requirement of the crop is supplied with slowly available nitrogen sources.</p> <p>New subsection f is inserted as follows: Nutrient management plans shall include a statement indicating that applications of inorganic nutrient sources, liquid manure, liquid sewage sludge, or liquid industrial waste are not to occur on frozen or snow covered ground. When ground is frozen, dry or semi-solid manures, dewatered sludges, or dewatered industrial wastes may only be applied if the field has: (i) slopes not greater than 6 %; (ii) 60 % uniform ground cover from crop residue or an existing actively growing crop such as a small grain or fescue with exposed plant height of three inches or more; (iii) a minimum of a 200 foot vegetated or adequate crop residue buffer between the application area and all surface water courses and; (iv) soils characterized by USDA as “well drained.”</p> <p>This change better aligns the regulation with regulatory requirements in the Board of Health’s Biosolids Use Regulations and the Water Control Board’s Poultry Waste Management Regulations and more clearly describes requirements for nutrient management plan content. It eliminates planner guidance information about emergency situations.</p>
<p>5 a</p>		<p>The application of nitrogen shall be managed to minimize runoff, leaching and volatilization losses.</p>	<p>Adds the words “containing materials” after the word “nitrogen.” This change is needed for clarity.</p>
<p>5 b</p>		<p>Limits the rates of liquid manures or sludges that are applied using irrigation equipment to specified limits to avoid runoff.</p>	<p>Adds the word “hydraulic” before the word “rates.” This change is needed to clarify that this section applies to liquid loading rates (i.e., inches per acre per application).</p>
<p>5 d</p>		<p>Encourages biosolids and manures to be soil incorporated where possible.</p>	<p>Adds industrial wastes and states the reason for the recommendation is to reduce losses on nitrogen to the atmosphere and to increase the plant available nitrogen to phosphorus ratio of these nutrient sources relative to crop nutrient needs. This change is needed to provide appropriate</p>

5 e		Specifies that the planner shall recommend certain buffer zones around environmental site features.	guidance to planners. Renames “buffer zones” as “setbacks,” adds “industrial waste” to the list of materials needing setbacks, and specifies that alternative setbacks must be used if specified in other regulations of permits. These changes are needed for clarity and to avoid conflicts with other regulations.
4 VAC 5-15-150 D 1 2 3 6		Specifies length of time that can be covered by a nutrient management plan. Specifies when plan modifications need to occur. Specifies when adjustments to manure production and applications should occur. Specifies how the pre-sidedress nitrogen test can be used to modify nitrogen recommendations.	Requires that cropland plans be developed for no more than three years. This change is needed since the usable life of a soil sample does not exceed three years and cropping system changes are more likely to occur on cropland than in permanent pasture or continuous hay. Specifies conditions when plans need to state a need for immediate modification and reduces need for modification in some instances if cropping systems, rotations, or fields change under certain circumstances. This change is needed to indicate the more serious situations needing immediate attention. Changes the word “ration” to “rations” for clarity reasons. Adds the stipulation that the pre-sidedress nitrogen test and interpretation must be consistent with Virginia Nutrient Management Standards and Criteria document. This change is needed for clarity.
Documents Incorporated by Reference			Replaces “Technical Guide” with “Electronic Field Office Technical Guide” and renames “Soil Conservation Service” as “Natural Resources Conservation Service”. Also, revises dates of other referenced documents to more current versions. Adds a reference for the Virginia Phosphorus Index Version 2.0 Technical Guide. Adds a new reference: Reference Soil and Media Diagnostic Procedures for the Southern Region of the United States, Southern Cooperative Series Bulletin No. 374. This document is referenced in the definition of “Mehlich III.

Family impact

Please assess the impact of the proposed regulatory action on the institution of the family and family stability.

This regulatory action may impact certain farm families if land for manure application generated by confined hog, dairy, or poultry farms is less than the acreage necessary to safely utilize the manure based on allowable phosphorus application rates. Conversely, failing to adopt the regulation may impact certain families that depend on adequate quality of water in rivers and the Chesapeake Bay to make a living. These would include families with members employed as watermen, or in other commercial and recreational industries such as tourism that are dependent on these natural resources. Also, the protection or improvement of water quality does have health and safety benefits for families that depend on groundwater as a source of drinking water.