

MARYLAND REGISTER

**Proposed Action on Regulations**

<b>Transmittal Sheet</b>  <b>PROPOSED OR REPROPOSED</b>  <b>Actions on Regulations</b>	<b>Date Filed with AELR Committee</b>	<b>TO BE COMPLETED BY DSD</b>
	11/14/2014	Date Filed with Division of State Documents
		Document Number
		Date of Publication in MD Register

**1. Desired date of publication in Maryland Register: 12/1/2014**

**2. COMAR Codification**

<b>Title</b>	<b>Subtitle</b>	<b>Chapter</b>	<b>Regulation</b>
15	20	04	11
15	20	07	02
15	20	08	01, .03, .05 - .12

**3. Name of Promulgating Authority**

Department of Agriculture

**4. Name of Regulations Coordinator**      **Telephone Number**  
Tonia C Martin                                      410-841-5829

**Mailing Address**

50 Harry S. Truman Parkway, Suite 303

**City**                      **State**              **Zip Code**  
Annapolis              MD                      21401

**Email**  
tonia.martin@maryland.gov

**5. Name of Person to Call About this Document**      **Telephone No.**  
Royden N. Powell, III                                      410-841-5867

**Email Address**

Royden.Powell@maryland.gov

**6. Check applicable items:**

New Regulations

Amendments to Existing Regulations

Date when existing text was downloaded from COMAR online: 11/14/14.

Repeal of Existing Regulations

Recodification

Incorporation by Reference of Documents Requiring DSD Approval

Reproposal of Substantively Different Text:

: Md. R

(vol.) (issue) (page nos) (date)

Under Maryland Register docket no.: --P.

**7. Is there emergency text which is identical to this proposal:**

Yes  No

**8. Incorporation by Reference**

Check if applicable: Incorporation by Reference (IBR) approval form(s) attached and 18 copies of documents proposed for incorporation submitted to DSD. (Submit 18 paper copies of IBR document to DSD and one copy to AELR.)

**9. Public Body - Open Meeting**

OPTIONAL - If promulgating authority is a public body, check to include a sentence in the Notice of Proposed Action that proposed action was considered at an open meeting held pursuant to State Government Article, §10-506(c), Annotated Code of Maryland.

OPTIONAL - If promulgating authority is a public body, check to include a paragraph that final action will be considered at an open meeting.

**10. Children's Environmental Health and Protection**

Check if the system should send a copy of the proposal to the Children's Environmental Health and Protection Advisory Council.

**11. Certificate of Authorized Officer**

I certify that the attached document is in compliance with the Administrative Procedure Act. I also certify that the attached text has been approved for legality by Craig A. Nielsen, Assistant Attorney General, (telephone #410-841-5883) on November 14, 2014. A written copy of the approval is on file at this agency.

**Name of Authorized Officer**

Mary Ellen Setting

**Title**

Deputy Secretary

**Telephone No.**

410-841-5880

**Date**

November 14, 2014

## **Title 15**

### **DEPARTMENT OF AGRICULTURE**

#### **Subtitle 20 SOIL AND WATER CONSERVATION**

##### **15.20.04 Nutrient Management Certification and Licensing**

#### **Subtitle 20 SOIL AND WATER CONSERVATION**

##### **15.20.07 Agricultural Operation Nutrient Management Plan Requirements**

#### **Subtitle 20 SOIL AND WATER CONSERVATION**

##### **15.20.08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation**

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

### **Notice of Proposed Action**

□

The Secretary of Agriculture proposes to add Supplement No. 8 (November, 2014) to the Maryland Nutrient Management Manual, which is incorporated by reference under COMAR 15.20.07.02 Supplement No. 8 (November, 2014) and includes modification to the method for determining nutrient recommendations, specifically the method for the determination of phosphorus as the limiting nutrient by transitioning to the use of the Phosphorus Management Tool. This action subsequently impacts COMAR 15.20.04.11 and 15.20.08.05 by defining the method and elements for determining required nutrient recommendations in a nutrient management plan.

### **Statement of Purpose**

The purpose of this action is to (1) Amend Regulation .11 under COMAR 15.20.04 Nutrient Management Certification and Licensing; (2) Amend Regulation .02 under COMAR 15.20.07 Agricultural Operation Nutrient Management Plan Requirements; and (3) Amend Regulations .01, .03, .05, .06, and .07; and new Regulations .08 — .12 under COMAR 15.20.08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation.

### **Comparison to Federal Standards**

There is no corresponding federal standard to this proposed action.

### **Estimate of Economic Impact**

#### **I. Summary of Economic Impact.**

The proposed regulation will affect certain farms with high phosphorus levels in the soil. Additional management will be required on farms based on the risk of phosphorus loss from the field. Generally, farmers will be required to reduce or eliminate the application of additional phosphorus to their fields. In cases where organic sources of nutrients, such as animal manures containing both phosphorus and nitrogen, have been applied, farmers will be required to purchase inorganic commercial fertilizer to provide the nitrogen previously provided by manure. These newly restricted animal manures will need to be transported to other farms to acreage that can appropriately utilize the manure in accordance with new requirements.

II. Types of Economic Impact.	Revenue (R+/R-)	Magnitude
	Expenditure (E+/E-)	
A. On issuing agency:	NONE	
B. On other State agencies:	NONE	
C. On local governments:	NONE	
	Benefit (+) Cost (-)	Magnitude
D. On regulated industries or trade groups:	(-)	\$22.5 million
E. On other industries or trade groups:	(+)	\$10.1 million
	NONE	
F. Direct and indirect effects on public:	(+)	\$100 million
	NONE	

**III. Assumptions.** (Identified by Impact Letter and Number from Section II.)

D. The proposed regulation will affect certain farms with high phosphorus levels in the soil. The proposal amends an existing risk assessment tool, known as the Phosphorus Site Index (PSI), used to determine the potential for phosphorus loss from the field. The new Phosphorus Management Tool (PMT), developed by scientists at the University of Maryland, is suggested to have the greatest potential impact on soils with high soil phosphorus in areas where ground water is closest to the surface.

Additional management will be required on farms based on the risk of phosphorus loss from the field. Generally, farmers will be required to reduce or eliminate the application of additional phosphorus to their fields. In cases where organic sources of nutrients, such as animal manures containing both phosphorus and nitrogen, have been applied, farmers will be required to purchase inorganic commercial fertilizer to provide the nitrogen previously provided by manure. These newly restricted animal manures will need to be transported to other farms to acreage that can appropriately utilize the manure in accordance with new requirements.

The Department commissioned a report by the Business Economic and Community Network (BEACON) at Salisbury University to analyze the costs and benefits associated with the implementation of the PMT. Under the direction of Dr. Memo Diriker, a stakeholder advisory group provided extensive detail on agricultural management and operational cost information. A range of macro level cost variables were considered for factors affected by the PMT, including agriculture, land values, recreation, water-based activities, crop fertilizer, manure transportation and handling, infrastructure, community costs, and others.

The BEACON study considered three implementation scenarios, including the six-year phase-in approach proposed by the regulation. The six year scenario assumed incentives and program support of \$79 million to offset farm-related costs and support the deployment of alternative technologies related to manure utilization. Current state and federal funding provide \$58 million of support and \$21 million is assumed to be new funding, with \$15.5 million of the new funding provided from state sources.

Cost variables were considered over a range of cost, given certain unknown factors, producing a range of net aggregate costs. The net aggregate cost for the six-year scenario at the 50th percentile is \$22.5 million. According to the report, this number represents macro level PMT implementation costs minus subsidies.

While the BEACON study considered both macro and micro (farm-scale) impacts, Dr. Diriker explains that specific farm-scale costs cannot be calculated until more specific detail regarding requirements are provided and certain experience is realized to inform further analysis. While certain farms will realize additional operating costs due to manure transportation and handling and replacement commercial fertilizer, other farms will likely realize lower operating costs through the use of relocated manure as a source of crop nutrients. The study developed a farm-scale template that can be activated to more specifically estimate individual farm impacts once additional information is available.

E(). Assuming 228,000 of additional poultry litter to require relocation to other farms for land application, an average cost of \$14 per ton for transportation costs, and existing level of Manure Transport Program activity is maintained, total public expenditures for manure transport will exceed \$4.6 million annually. These subsidies translate into additional economic activity for contractors providing these services to farmers. Additionally, infrastructure expansion costs for manure transportation and loading equipment, plus additional spreading equipment for commercial fertilizer is estimated to generate \$5.5 million in sales for vendors of such new equipment.

F(). The public will benefit from the proposal through improved water quality and environmental conditions in local rivers and streams. The quality of life of Marylanders will improve by virtue of healthy local water bodies and additional measures toward a restored Chesapeake Bay.

The BEACON study included consideration of environmental and social benefits that might be derived from implementing the PMT. The final report cites an October 2014 Chesapeake Bay Foundation (CBF) report, *The Economic Benefits of Cleaning Up the*

Chesapeake Bay. The CBF report attributes \$4.6 billion of annual economic benefit to Maryland as result of meeting Bay restoration goals. BEACON estimates \$100 million of statewide economic benefits associated with implementing the PMT on the Eastern Shore. However the BEACON report cites, “While significant, this statewide MACRO-Level benefit estimate attributable to the implementation of the PMT on the Eastern Shore cannot be directly compared to the farm-level costs of implementation estimated in the three scenarios. Most of the MACRO-Level benefit estimates involve value enhancements and potential cost savings. They are not financial resources that can be used to defray the farmers’ PMT implementation costs.”

A copy of A Scenario Analysis of the Potential Costs of Implementing the Phosphorus Management Tool on the Eastern Shore of Maryland, BEACON at Salisbury University, November 2014, is available on the Department’s website at <http://mda.maryland.gov/Documents/pmt-analysis.pdf>.

### **Economic Impact on Small Businesses**

The proposed action has a meaningful economic impact on small business. An analysis of this economic impact follows.

The proposed regulation will affect certain farms with high phosphorus levels in the soil. The proposal amends an existing risk assessment tool, known as the Phosphorus Site Index (PSI), used to determine the potential for phosphorus loss from the field. The new Phosphorus Management Tool (PMT), developed by scientists at the University of Maryland, is suggested to have the greatest potential impact on soils with high soil phosphorus in areas where ground water is closest to the surface.

Additional management will be required on farms based on the risk of phosphorus loss from the field. Generally, farmers will be required to reduce or eliminate the application of additional phosphorus to their fields. In cases where organic sources of nutrients, such as animal manures containing both phosphorus and nitrogen, have been applied, farmers will be required to purchase inorganic commercial fertilizer to provide the nitrogen previously provided by manure. These newly restricted animal manures will need to be transported to other farms to acreage that can appropriately utilize the manure in accordance with new requirements.

### **Impact on Individuals with Disabilities**

The proposed action has no impact on individuals with disabilities.

### **Opportunity for Public Comment**

Comments may be sent to Earl F. Hance, Secretary, Maryland Department of Agriculture, 50 Harry S. Truman Parkway Suite 303, Annapolis, Maryland 21401, or call 410-841-5881, or email to [Earl.Hance@maryland.gov](mailto:Earl.Hance@maryland.gov), or fax to 410-841-5914. Comments will be accepted through December 31, 2014. A public hearing has not been scheduled.

## **Economic Impact Statement Part C**

- A. Fiscal Year in which regulations will become effective: FY 2015
- B. Does the budget for the fiscal year in which regulations become effective contain funds to implement the regulations?  
Yes
- C. If 'yes', state whether general, special (exact name), or federal funds will be used: General and special funds.
- D. If 'no', identify the source(s) of funds necessary for implementation of these regulations:
- E. If these regulations have no economic impact under Part A, indicate reason briefly:
- F. If these regulations have minimal or no economic impact on small businesses under Part B, indicate the reason and attach small business worksheet.
- G. Small Business Worksheet:

Attached Document:

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# **Title 15 DEPARTMENT OF AGRICULTURE**

## **Subtitle 20 SOIL AND WATER CONSERVATION**

### **Chapter 04 Nutrient Management Certification and Licensing**

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

**.01 — .10** Text unchanged.

**.11 Record-Keeping and Reporting Requirements.**

A. Text unchanged.

B. *Information concerning the Phosphorus Management Tool.*

*(1) As provided in subsections (2) and (3) of this section, a license holder or a certified consultant who is not operating under a license shall file a report with the Department that includes information relating to nutrient management plans developed for operations which have soils with a phosphorus fertility index value of 150 or above.*

(2) *The report shall include information that the Department determines necessary to evaluate the implementation of the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2.*

(3) *The report shall be filed on a form developed by the Department in accordance with a schedule determined by the Department.*

(4) *The Department shall maintain the confidentiality of information provided in the report as required by Agriculture Article § 8-801.1(b), Annotated Code of Maryland.*

[B.] C. Nutrient Management License Holder Record-Keeping Requirements. A license holder shall keep:

(1) — (3) Text unchanged.

.12 — .13 Text unchanged.

## **Chapter 07 Agricultural Operation Nutrient Management Plan Requirements**

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

.01 Text unchanged.

### **.02 Incorporation by Reference.**

The performance and technical standards provided in this subtitle are found in the Department of Agriculture's Maryland Nutrient Management Manual (November 1999), Supplement No. 1 (September 2000), Supplement No. 2 (November 2001), Supplement No. 3 (September 2004), Supplement No. 4 (November 2005), [and] Supplement No. 5 (November 2006), Supplement No. 6 (May 2009), [and] Supplement No. 7 (May 2012), and Supplement No. 8 (November 2014), which are incorporated by reference.

.03 — .07 Text unchanged.

## **Chapter 08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation**

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

### **.01 Scope.**

A. — .C Text unchanged.

*D. This chapter also describes the transition from the Phosphorus Site Index to the Phosphorus Management Tool as a means to identify potential risk of phosphorus loss from farms. Like the Phosphorus Site Index, the Phosphorus Management Tool will be employed when a soil sample analysis shows a phosphorus fertility index value (“P FIV”) of 150 or greater. As shown in the chart in Regulation .10 of this Chapter, the Phosphorus Management Tool will be*

*phased-in over a six-year period. Farms that have excess soil phosphorus will be placed in one of three risk-based tiers, as determined by the particular operation's average phosphorus fertility index value. Farms in the high risk tier (those with an average P FIV of 450 and greater) will be the first operations required to begin implementing the Phosphorus Management Tool, but will be given a longer time-frame to fully implement it. Farms in the low and mid-risk tiers (those with an average P FIV, respectively, of (1) 150 and greater but less than 300, and (2) 300 and greater but less than 450) will be required to begin implementing the Phosphorus Management Tool later but will be given less time to complete this transition.*

**.02** Text unchanged.

**.03 Definitions.**

A. Text unchanged.

B. Terms Defined.

(1) – (3) Text unchanged

(4) *“Average Soil Phosphorus Fertility Index Value” or “Average Soil P FIV” means a value:*

*(a) Determined for an agricultural operation by averaging the P FIV of all fields or management units within the operation that have a P FIV greater than 150 (calculated by adding together the P FIV of each field or management unit within the operation that has a P FIV greater than 150 and dividing this sum by number of any such fields or management units); and*

*(b) Established no later than June 30, 2016, using soil tests not more than three years old.*

[(4)] (5) "Best management practice" means a conservation or pollution control practice that manages soil, nutrient losses, or other potential pollutant sources to:

(a) — (b) Text unchanged.

[(5)] (6) "Bioavailable" means a nutrient supply that is either currently, or likely to be, available to a plant or crop.

[(6)] [7] "Biosolids" means any thickened liquid, suspended or settled solid, or dried residue extracted from sewage at a sewage treatment plant, including domestic sewage, that:

(a) — (b) Text unchanged.

[(7)] (8) "Certified farm operator" means an individual certified by the Department under this subtitle to prepare a nutrient management plan solely for agricultural land that the individual:

(a) — (c) Text unchanged.

[(8)] (9) "Certified nutrient management consultant" or "consultant" means an individual certified by the Department under this subtitle to prepare a nutrient management plan.

[(9)] (10) Chemical Fertilizer.

(a) — (b) Text unchanged.

[(10)] (11) "Controlled release fertilizer" means a type of fertilizer that releases nutrients over time and which may be categorized as follows:

(a) — (d) Text unchanged.

[(11)] (12) "Cover crop" means a crop including, but not limited to, cereal grains, that is planted following the harvest of summer crops for the purpose of:

(a) — (c) Text unchanged.

[(12)] (13) "Crop or plant nutrient needs" means the primary nutrient requirements of a crop, usually determined as pounds of total nitrogen (N), available phosphate (P<sub>2</sub>O<sub>5</sub>), or soluble potash (K<sub>2</sub>O), required for production of a crop yield unit, such as a bushel of corn.

[(13)] (14) "Department" means the Maryland Department of Agriculture or its designee.

[(14)] (15) "Environmental risk assessment for out-of-ground production" means a method used to evaluate risk from stormwater and runoff management and water application (irrigation) methods that is acceptable to the Department, as described in the Maryland Nutrient Management Manual, Section II-D.

[(15)] (16) "Expected crop yield" means a realistic crop yield for the agricultural operation determined by yield records or soil productivity information.

[(16)] (17) "Fertility index value (FIV)" means an index developed by the University of Maryland that is:

(a) — (b) Text unchanged.

[(17)] (18) "Fertilizer" means a substance containing a recognized primary plant nutrient used for its plant nutrient content and designed for use in promoting plant growth.

[(18)] (19) "Field identification number" means a number or unique identifier used by an agricultural operator to distinguish or pinpoint the location of a field or management unit on a farm.

(20) "*High Risk Tier*" means those farms that have an average soil P FIV of 450 or greater.

[(19)] (21) "Liming" means the application of materials containing the carbonates, oxides, or hydroxides of calcium or magnesium in a condition, and in a quantity, adequate to manage soil acidity.

(22) *"Low Risk Tier" means those farms that have an average soil P FIV of 150 or greater but less than 300.*

[(20)] (23) "Management unit" means an area sharing common characteristics, including soil type, nutrient content, and plant type or crop produced, so that nutrients can be recommended and managed in a uniform and consistent manner.

[(21)] (24) "Manure management" means operations and conditions specific to an agricultural operation that has animals, or uses animal manure or waste nutrients from animal production. The purpose of manure management in nutrient management planning is to improve efficiency and effectiveness of nutrient utilization and to minimize the potential for nutrient loss from the management of animals or their manure and associated waste nutrients. Guidelines for manure management are described in the Maryland Nutrient Management Manual, Section III-C.

(25) *"Mid-Risk Tier" means those farms that have an average soil P FIV of 300 or greater but less than 450.*

[(22)] (26) "Mineralization" means the process that converts unavailable organic forms of nutrient elements to an available inorganic state as a result of bacterial decomposition.

[(23)] (27) "Natural organic fertilizer" means a fertilizer derived from plant or animal products, including animal manure, biosolids, green manure, compost, or plant materials, or other residuals used as a source of primary nutrients, which:

(a) — (b) Text unchanged.

[(24)] (28) "Nutrient application rate" means the quantity of primary nutrients, including total nitrogen (N), available phosphate (P<sub>2</sub>O<sub>5</sub>), or soluble potash (K<sub>2</sub>O), recommended by a certified consultant to:

(a) — (b) Text unchanged.

[(25)] (29) "Nutrient content" means the percentage of any primary nutrients as total nitrogen (N), available phosphate (P<sub>2</sub>O<sub>5</sub>), or soluble potash (K<sub>2</sub>O) in any type or source of fertilizer.

[(26)] (30) "Nutrient management plan" means a plan prepared by a certified nutrient management consultant or certified farm operator to manage the amount, placement, timing, and application of animal manure, fertilizer, biosolids, or other plant nutrients to minimize nutrient loss or runoff and to maintain the productivity of soil when growing agricultural products.

[(27)] (31) "Operator" means a person who owns or manages an agricultural operation.

[(28)] (32) "Out-of-ground or container production" means the production of plants whose roots are not actually growing in the soil column.

[(29)] (33) "Person" means the State, any county, municipal corporation, or other political subdivision of the State, or any of their units, or an individual, receiver, trustee, guardian,

executor, administrator, fiduciary, or representative of any kind, or any partnership, firm, association, public or private corporation, or any other entity, unless otherwise provided.

(34) *“Phosphorus Management Tool” means the new procedure developed by the University of Maryland, approved by the Department, and described in the Maryland Nutrient Management Manual, Section II-C, that:*

*(a) Uses characteristics of soils, landforms, and management practices to identify potential risk of phosphorus losses from soils to waters; and*

*(b) Will be phased-in between 2016 and 2021, ultimately replacing the Phosphorus Site Index.*

[(30)] (35) "Phosphorus [s]Site [i]Index" means the original procedure developed by the University of Maryland, approved by the Department, and described in the Maryland Nutrient Management Manual, Section II-C, that:

(a) — (b) Text unchanged.

(36) *“Phosphorus Transition Management Phase I” means the first of two management phases that farms with a soil P FIV of 150 or greater shall employ when transitioning from use of the Phosphorus Site Index to the Phosphorus Management Tool as a means to determine the application of additional phosphorus that:*

*(a) Consists of three risk categories determined by a calculation of the Phosphorus Management Tool, and;*

*(b) Includes a schedule for implementation based on the average soil P FIV for the operation.*

(37) *“Phosphorus Transition Management Phase II means the second of two management phases that farms with a soil P FIV of 150 or greater shall employ when transitioning from the use of the Phosphorus Site Index to the Phosphorus Management Tool as a means to determine the application of additional phosphorus that:*

*(a) Consists of three risk categories determined by a calculation of the Phosphorus Management Tool; and*

*(b) Includes a schedule for implementation based on the average soil P FIV for the operation.*

[(31)] (38) "Plant production goal" means a statement of the estimated length of time that plants will be grown, and appropriate measure of expected plant size, such as height or diameter.

[(32)] (39) "Primary nutrients" means a plant food that is essential for normal plant growth, and includes total nitrogen (N), available phosphate (P<sub>2</sub>O<sub>5</sub>), or soluble potash (K<sub>2</sub>O).

[(33)] (40) "Residual nutrients" means the level of nitrogen, phosphorus, and potassium available in the soil from previous nutrient sources or unharvested plants or plant parts, or the baseline nutrient levels in the soil.

[(34)] (41) "Soil leaching potential" means the potential for a given soil to be subject to nitrate and soluble chemical leaching below the root zone.

[(35)] (42) "Soil pH level" means the relative acidity or alkalinity of a soil and refers to the hydrogen ion concentration in the soil solution.

[(36)] (43) "Substrate" means organic or inorganic material, often bark, peat, and sand, used as media components in a container to support the plant and contain the root system.

[(37)] (44) "Volatilization" means a process in which nitrogen losses to the atmosphere occur as ammonia.

[(38)] (45) "Watershed code" means the code used by the State to identify a hydrologic unit area.

[(39)] (46) Waters.

(a) — (b) Text unchanged.

**.04** Text unchanged.

**.05 Nutrient Management—Required Plan Recommendations.**

A. – D. Text unchanged.

E. Determination of Limiting Nutrient.

(1) – (2) Text unchanged.

(3) If the soil sample analysis results show a phosphorus fertility index value (FIV) of less than 150, nutrient recommendations may [use] *be based on* nitrogen plant needs as the limiting factor *in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section 1-B.*

(4) Phosphorus *criteria for low risk tier operations.*

*(a) Except for nutrient management plans developed in accordance with paragraph (e) of this subsection, the certified consultant shall:*

*(i) Provide the operator information outlining the changes in the management of the operation that will be required when the Phosphorus Management Tool becomes effective;*

*(ii) Calculate the Average Soil Phosphorus Fertility Index Value for the operation; and*

*(iii) Report the Average Soil Phosphorus Fertility Index Value for the operation to the Department on a form provided by the Department no later than September 1, 2016.*

*(b) Nutrient management plans developed for implementation before July 1, 2018 shall:*

*(i) Be developed using both the Phosphorus Site Index and the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C; and*

*(ii) Use the Phosphorus Site Index set forth in Regulation .06 to determine phosphorus applications.*

*(c) Nutrient management plans developed for implementation between July 1, 2018 and June 30, 2019 shall use the Phosphorus Transition Management Phase 1 set forth in Regulation .07 to determine phosphorus applications.*

*(d) Nutrient management plans developed for implementation between July 1, 2019 and June 30, 2020 shall use the Phosphorus Transition Management Phase 2 set forth in Regulation .08 to determine phosphorus applications.*

*(e) Nutrient management plans developed for implementation after July 1, 2020 shall use the Phosphorus Management Tool set forth in Regulation .09 to determine phosphorus applications.*

*(5) Phosphorus criteria for mid-risk tier operations.*

*(a) Except for nutrient management plans developed in accordance with paragraph (e) of this subsection, the certified consultant shall:*

*(i) Provide the operator information outlining the changes in the management of the operation that will be required when the Phosphorus Management Tool becomes effective;*

*(ii) Calculate the Average Soil Phosphorus Fertility Index Value for the operation; and*

*(iii) Report the Average Soil Phosphorus Fertility Index Value for the operation to the Department on a form provided by the Department no later than September 1, 2016.*

*(b) Nutrient management plans developed for implementation before July 1, 2017 shall use the Phosphorus Site Index set forth in Regulation .06 to determine phosphorus applications.*

*(c) Nutrient management plans developed for implementation between July 1, 2017 and June 30, 2018 shall use the Phosphorus Transition Management Phase 1 set forth in Regulation .07 to determine phosphorus applications.*

*(d) Nutrient management plans developed for implementation between July 1, 2018 and June 30, 2020 shall use the Phosphorus Transition Management Phase 2 set forth in Regulation .08 to determine phosphorus applications.*

*(e) Nutrient management plans developed for implementation after July 1, 2020 shall use the Phosphorus Management Tool set forth in Regulation .09 to determine phosphorus applications.*

*(6) Phosphorus criteria for high risk tier operations.*

*(a) Except for nutrient management plans developed in accordance with paragraph (e) of this subsection, the certified consultant shall:*

*(i) Provide the operator information outlining the changes in the management of the operation that will be required when the Phosphorus Management Tool becomes effective;*

*(ii) Calculate the Average Soil Phosphorus Fertility Index Value for the operation; and*

*(iii) Report the Average Soil Phosphorus Fertility Index Value for the operation to the Department on a form provided by the Department no later than September 1, 2016.*

*(b) Nutrient management plans developed for implementation prior to July 1, 2016 shall use the Phosphorus Site Index set forth in Regulation .06 to determine phosphorus applications.*

*(c) Nutrient management plans developed for implementation between July 1, 2016 and June 30, 2018 shall use the Phosphorus Transition Management Phase 1 set forth in Regulation .07 to determine phosphorus applications.*

*(d) Nutrient management plans developed for implementation between July 1, 2018 and June 30, 2020 shall use the Phosphorus Transition Management Phase 2 set forth in Regulation .08 to determine phosphorus applications.*

*(e) Nutrient management plans developed for implementation after July 1, 2020 shall use the Phosphorus Management Tool set forth in Regulation .09 to determine phosphorus applications.*

[(a) If the soil sample analysis results show a phosphorus fertility index value (FIV) of 150 or greater, a phosphorus site index or other phosphorus risk assessment method acceptable to the Department, as provided in the Maryland Nutrient Management Manual, Section II-B, shall be used to determine the potential risk of phosphorus loss due to site characteristics.

(b) If the risk for potential movement of phosphorus from the site is low according to the phosphorus site index, nutrient recommendations by the consultant or certified farm operator may use nitrogen plant needs as the limiting factor.

(c) If the risk for potential movement of phosphorus from the site is medium according to the phosphorus site index:

(i) Nutrient rates shall be based on nitrogen plant needs as the limiting factor no more than 1 out of every 3 years. Phosphorus rates the other 2 years shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater; or

(ii) Nutrient recommendations may use nitrogen plant needs as the limiting factor if BMPs are implemented by the operator and address site or management characteristics to reduce the risk of phosphorus loss to low.

(d) If the risk for potential movement of phosphorus from the site is high according to the phosphorus site index:

(i) Phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B; or

(ii) If BMPs are implemented by the operator, and address site or management characteristics to reduce the risk of phosphorus loss to medium, nutrient rates may be based on nitrogen plant needs as the limiting factor not more than 1 out of every 3 years. Phosphorus rates the other 2 years shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing or in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(e) If the risk for potential movement of phosphorus from the site is very high according to the phosphorus site index:

(i) No additional phosphorus may be applied; or

(ii) If BMPs are implemented by the operator, and address site or management characteristics to reduce the risk of phosphorus loss to high, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B.

(5) Before the deadlines set forth in COMAR 15.20.07.03 for the development of a phosphorus-based plan, a certified nutrient management consultant or certified farm operator may use:

(a) The requirements of §E(1)—(3) of this regulation as a planning tool to determine if future management changes are indicated by the P index, and if development of a phased-in approach to a phosphorus-based plan should be recommended; or

(b) §E(1)—(3) of this regulation as a guide to determine nutrient management recommendations.]

F. – I. Text unchanged.

**[.06 Nutrient Management for Container or Out-of-Ground Agricultural Production —  
Additional Required Plan Content.**

A. A certified nutrient management consultant or certified farm operator shall prepare, and an operator of container or out-of-ground agricultural production shall conform to the requirements of §§B—H of this regulation, in addition to applicable requirements described in this chapter, when developing and implementing, a nutrient management plan.

B. Plan Elements. A plan shall contain a summary of planned plant production applicable to the site, including:

(1) A listing of plants to be grown by name, species, and variety and cultivar or both; however, if more than 20 different kinds of plants are grown, general plant categories may be used, such as herbaceous, deciduous shrub, coniferous evergreen, broadleaf evergreen, or trees;

(2) The estimated greatest number of plants, units, or containers that will be in production at any one time during a calendar year and the month this will occur;

(3) The estimated percentages of plants, units, or containers in the following container size categories:

(a) Less than 1 gallon (less than 2,492 cubic centimeters container volume),

(b) From 1 to 3 gallons (2,492 to 12,164 cubic centimeters),

(c) Greater than 3 gallons and less than 15 gallons (more than 12,164, but less than 45,376 cubic centimeters), or

(d) 15 gallons or greater (45,376 cubic centimeters or more);

(4) An inventory, which may include projected changes during the life of the plan, taken by the operator for any purpose within 12 months of completion of the plan, which shall meet the requirements of §B(1), (2), and (3) of this regulation, if the inventory is representative of planned production during the period covered by a nutrient management plan;

(5) Total growing area under the plan, which may include projected changes in growing area planned to take place during the life of the plan.

C. Summary of Nutrient Recommendations. A plan shall contain summary information on the total amount of primary nutrients recommended for each calendar year covered by the plan, including:

(1) The estimated total amounts of nitrogen, phosphorus, and potash;

(2) A listing of all sources of nutrients;

(3) The estimated amounts of each source of nutrients to be applied for each quarter of the year; and

(4) A listing or description of the application method or methods for each nutrient.

D. Assessment of Environmental Risk. A nutrient management plan shall contain an assessment of the risk of nutrient losses to surface water, using the Environmental Risk Assessment for out-of-ground production provided in the Maryland Nutrient Management Manual, Section II-D.

E. General Management Recommendations. A plan shall contain general recommendations to ensure efficient application of nutrients, including:

(1) The calibration of equipment;

- (2) The timing and application methods for water and nutrients;
- (3) Management options to maximize the efficient use of water;
- (4) Any operator management options to reduce nutrient losses; and

(5) Any other best management practices that may be applicable as provided in the Maryland Nutrient Management Manual, Section II-E.

F. Specific Management Recommendations. A consultant or certified farm operator shall recommend growing area or section-specific management techniques to improve water use efficiency and minimize nutrient losses, including the following:

- (1) Grouping plants to improve water and nutrient usage;
- (2) Monitoring water and nutrient needs of plants;
- (3) Increasing the percentage of water and nutrients entering the plant root zone;
- (4) Reducing the amount of leachate or runoff; and
- (5) Reducing or containing the flow of water from growing areas.

G. Program for Monitoring Runoff. A nutrient management plan shall include recommendations to monitor runoff, as required in Regulation .07C of this chapter, including recommendations on methods, frequency, and locations of monitoring.

H. Plan Maintenance. A plan shall contain information to maintain and update the plan. General comments about plan maintenance may be summarized, but shall include:

- (1) The length of time the plan is effective, not to exceed 3 years; and
- (2) Identification of changes in the agricultural operation that would require the original plan to be modified or updated, including a:
  - (a) Change in area managed of 20 percent or greater, or 5 acres, whichever is less, or
  - (b) Substantial change in a production plan or method.]

#### **.06 Nutrient Management—Phosphorus Site Index.**

*A. If the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Site Index, as provided in the Maryland Nutrient Management Manual, Section II-C1, shall be used to determine the potential risk of phosphorus loss due to site characteristics.*

*B. Low Risk of Potential Phosphorus Loss. If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Site Index, nutrient recommendations by the consultant or certified farm operator may use nitrogen plant needs as the limiting factor.*

*C. Medium Risk of Potential Phosphorus Loss.*

*(1) Except as provided in C(2) of this Regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Site Index, nutrient rates shall be based on nitrogen plant needs as the limiting factor no more than one out of every three years. Phosphorus rates for the other two years shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.*

*(2) Nutrient recommendations may use nitrogen plant needs as the limiting factor if BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Site Index, reduce the risk of phosphorus loss to low.*

*D. High Risk of Potential Phosphorus Loss.*

*(1) Except as provided in D(2) of this Regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Site Index, phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Site Index, reduce the risk of phosphorus loss to medium, nutrient rates may be based on nitrogen plant needs as the limiting factor not more than one out of every three years. Phosphorus rates for the other two years shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing or in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.*

*E. Very High Risk of Potential Phosphorus Loss.*

*(1) Except as provided in E(2) of this Regulation, if the risk for potential loss of phosphorus from the site is very high according to the Phosphorus Site Index, no additional phosphorus may be applied.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Site Index, reduce the risk of phosphorus loss to high, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.*

*(3) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss, based on research and demonstration of the University of Maryland, or other land grant university, or by the United*

*States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.*

**[.07 Nutrient Management—Required Plan Recommendations for Container or Out-of-Ground Production.**

A. Nutrient Recommendations. A certified nutrient management consultant or certified farm operator shall evaluate production cycles and methods and make nutrient recommendations based on at least one of the following:

(1) The label recommendations on fertilizer products for the plants being grown or similar plants;

(2) The recommendations of the University of Maryland Cooperative Extension for the specific plants being grown or for similar plants;

(3) The recommendation from other state universities for the specific plants being grown or for similar plants;

(4) The data from research done by accredited universities on the specific plants being grown or similar plants;

(5) The general nutrition guidelines for similar plants; or

(6) Any generally accepted growing practices for plants under comparable growing conditions.

B. Management Recommendations.

(1) A consultant or certified farm operator shall use the Environmental Risk Assessment for out-of-ground production, as provided in the Maryland Nutrient Management Manual, Section II-D, to identify the potential risk to the environment of nutrient movement from out-of-ground growing areas.

(2) For growing areas where there is zero or low risk of nutrient movement from the site, recommendations shall be made to maintain this zero or low level of risk.

(3) For growing areas where there is medium risk of nutrient movement:

(a) Management recommendations shall be made to minimize the risk of nutrients moving to, or reaching, surface waters; and

(b) The consultant or certified farm operator shall recommend that the operator or other person responsible for irrigation and nutrient management attend Department-approved training on best management practices for out-of-ground production to minimize nutrient losses.

(4) For growing areas where there is high risk of nutrient movement:

(a) Management recommendations shall be made for individual growing areas, as well as for the operation as a whole, to reduce the risk of nutrients moving to, or reaching, surface waters;

(b) The consultant or certified farm operator shall recommend that the operator or other person responsible for irrigation and nutrient management attend Department-approved training on best management practices for out-of-ground production that teaches how to minimize nutrient losses; and

(c) Only controlled release fertilizer shall be recommended for use until management changes reduce the risk of nutrient loss to medium.

(5) In recommending field or management unit practices to reduce or minimize nutrient losses, a consultant or certified farm operator shall consider the following:

(a) The appropriate nutrient application methods;

(b) Nutrient application timing; and

(c) Any plant nutrient needs.

(6) Timing of nutrient application shall be as close to plant nutrient uptake as possible, except in the case of controlled release fertilizer, which may be applied at any time.

C. Recommendations for Monitoring Runoff. Unless an operation is assessed as zero risk for nutrient loss from the site, as provided in the Maryland Nutrient Management Manual, Section II-D, the nutrient management consultant shall recommend a monitoring program, including the following:

(1) The periods for monitoring when plant nutrients can reasonably be expected to be available;

(2) The locations immediately next to growing areas or areas where runoff or overflow from collection basins enters surface water, municipal stormwater, or drainage inlets; and

(3) The frequency of sampling for nutrients:

(a) Where the risk of nutrient movement from any growing area is low, monitoring shall include samples for testing a minimum of two different times during each growing season or cycle from each location; and

(b) Where the risk of impacting surface water is medium or high, monitoring recommendations shall be conducted monthly when nutrients are being applied.

D. Methods of Sampling and Testing. Samples may be analyzed by the operator or consultant on-site using calibrated electrical conductivity (EC) or nutrient meters. To evaluate the accuracy of on-site test results, at least two samples per year shall be split, with one part being sent to an independent laboratory for analysis.]

## **.07 Nutrient Management—Phosphorus Transition Management Phase I.**

*A. If the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2, shall be used to determine the potential risk of phosphorus loss due to site characteristics.*

*B. Low Risk of Potential Phosphorus Loss.*

*(1) If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Management Tool, nutrient recommendations by the consultant or certified farm operator may use nitrogen plant needs as the limiting factor.*

*(2) Nutrient applications shall not exceed the amount of phosphorus removed by the planned crop over a three-year period.*

*C. Medium Risk of Potential Phosphorus Loss.*

*(1) Except as provided in C(2) of this Regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a three-year period shall not exceed the amount of phosphorus removed by the planned crops over the three-year period, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to low, nutrient rates may be established as provided by section B of this Regulation.*

*D. High Risk of Potential Phosphorus Loss.*

*(1) Except as provided in D(2) of this Regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Management Tool, phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to medium, nutrient rates may be established as provided by section C of this Regulation.*

*(3) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss, based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.*

**.08 Nutrient Management—Phosphorus Transition Management Phase II.**

*A. If the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2, shall be used to determine the potential risk of phosphorus loss due to site characteristics.*

*B. Low Risk of Potential Phosphorus Loss. If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a three-year period shall not exceed the amount of phosphorus removed by the planned crops over the three-year period, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B , whichever is greater.*

*C. Medium Risk of Potential Phosphorus Loss.*

*(1) Except as provided in C(2) of this Regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a two-year period shall not exceed the amount of phosphorus removed by the planned crops over the two-year period, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B , whichever is greater.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to low, nutrient rates may be established as provided by section B of this Regulation.*

*D. High Risk of Potential Phosphorus Loss.*

*(1) Except as provided in D(3) of this Regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Management Tool, phosphorus rates shall be limited to 50 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B , whichever is greater.*

*(2) If limits of technology of available application equipment prevent application at 50 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B , whichever is greater.*

*(3) If BMPs are implemented by the operator before or during the application of additional phosphorus, that address site or management characteristics which, according to the outcome of*

*a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to medium, nutrient rates may be established as provided by section C of this Regulation.*

*(4) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss, based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.*

***.09 Nutrient Management—Phosphorus Management Tool.***

*A. If the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2, shall be used to determine the potential risk of phosphorus loss due to site characteristics.*

*B. Low Risk of Potential Phosphorus Loss. If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a three-year period shall not exceed the amount of phosphorus removed by the planned crops over the three-year period.*

*C. Medium Risk of Potential Phosphorus Loss.*

*(1) Except as provided in C (2) of this Regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Management Tool, phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B , whichever is greater.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to low, nutrient rates may be established as provided by section B of this Regulation.*

*D. High Risk of Potential Phosphorus Loss.*

*(1) Except as provided in D(2) through (6) of this Regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Management Tool, no additional phosphorus may be applied.*

*(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to medium, nutrient rates may be established as provided by section C of this Regulation.*

*(3) If the crop to be produced is certified as organic pursuant to the requirements of the federal Organic Foods Production Act, 7 U.S.C. § 6501 et seq., including implementing federal*

regulations, as amended, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, or the amount indicated by soil testing in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(4) Except when subject to cold and wet growing conditions, crops determined to be deficient in phosphorus, as demonstrated by a representative tissue analysis by an accredited laboratory, may receive an application of phosphorus not to exceed 25 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application.

(5) Crops with a recommended phosphorus application rates of 100 pounds or more at optimum fertility levels as provided in the Maryland Nutrient Management Manual, Section I-B, may receive a phosphorus application at planting not to exceed 25 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application.

(6) Agricultural operations implementing technologies to reduce the phosphorus content of animal manures by at least 75 percent shall limit phosphorus application rates to 50 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application.

(7) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss, based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.

**.10 Summary Schedule – Transition from Phosphorus Site Index to Phosphorus Management Tool.**

**SIX-YEAR TRANSITION SCHEDULE**

	<i>Crop Year (July 1—June 30, following year)</i>					
	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
<i>Average P FIV &gt;450 (High Risk Tier)</i>	<i>PSI</i>	<i>TM1</i>	<i>TM1</i>	<i>TM2</i>	<i>TM2</i>	<i>PMT</i>
<i>Average P FIV 300-450 (Mid-Risk Tier)</i>	<i>PSI</i>	<i>PSI</i>	<i>TM1</i>	<i>TM2</i>	<i>TM2</i>	<i>PMT</i>
<i>Average P FIV 150-299 (Low Risk Tier)</i>	<i>PSI</i>	<i>PSI</i>	<i>PSI</i>	<i>TM1</i>	<i>TM2</i>	<i>PMT</i>

*PSI—Phosphorus Site Index*

*TM1—Transition Management Phase 1*

**TM2—Transition Management Phase 2**

**PMT—Phosphorus Management Tool**

**.11 Nutrient Management for Container or Out-of-Ground Agricultural Production —  
Additional Required Plan Content.**

A. A certified nutrient management consultant or certified farm operator shall prepare, and an operator of container or out-of-ground agricultural production shall conform to the requirements of §§B—H of this regulation, in addition to applicable requirements described in this chapter, when developing and implementing, a nutrient management plan.

B. *Plan Elements.* A plan shall contain a summary of planned plant production applicable to the site, including:

(1) A listing of plants to be grown by name, species, and variety and cultivar or both; however, if more than 20 different kinds of plants are grown, general plant categories may be used, such as herbaceous, deciduous shrub, coniferous evergreen, broadleaf evergreen, or trees;

(2) The estimated greatest number of plants, units, or containers that will be in production at any one time during a calendar year and the month this will occur;

(3) The estimated percentages of plants, units, or containers in the following container size categories:

(a) Less than 1 gallon (less than 2,492 cubic centimeters container volume),

(b) From 1 to 3 gallons (2,492 to 12,164 cubic centimeters),

(c) Greater than 3 gallons and less than 15 gallons (more than 12,164, but less than 45,376 cubic centimeters), or

(d) 15 gallons or greater (45,376 cubic centimeters or more);

(4) An inventory, which may include projected changes during the life of the plan, taken by the operator for any purpose within 12 months of completion of the plan, which shall meet the requirements of §B(1), (2), and (3) of this regulation, if the inventory is representative of planned production during the period covered by a nutrient management plan;

(5) Total growing area under the plan, which may include projected changes in growing area planned to take place during the life of the plan.

C. *Summary of Nutrient Recommendations.* A plan shall contain summary information on the total amount of primary nutrients recommended for each calendar year covered by the plan, including:

(1) The estimated total amounts of nitrogen, phosphorus, and potash;

(2) A listing of all sources of nutrients;

(3) *The estimated amounts of each source of nutrients to be applied for each quarter of the year; and*

(4) *A listing or description of the application method or methods for each nutrient.*

*D. Assessment of Environmental Risk. A nutrient management plan shall contain an assessment of the risk of nutrient losses to surface water, using the Environmental Risk Assessment for out-of-ground production provided in the Maryland Nutrient Management Manual, Section II-D.*

*E. General Management Recommendations. A plan shall contain general recommendations to ensure efficient application of nutrients, including:*

(1) *The calibration of equipment;*

(2) *The timing and application methods for water and nutrients;*

(3) *Management options to maximize the efficient use of water;*

(4) *Any operator management options to reduce nutrient losses; and*

(5) *Any other best management practices that may be applicable as provided in the Maryland Nutrient Management Manual, Section II-E.*

*F. Specific Management Recommendations. A consultant or certified farm operator shall recommend growing area or section-specific management techniques to improve water use efficiency and minimize nutrient losses, including the following:*

(1) *Grouping plants to improve water and nutrient usage;*

(2) *Monitoring water and nutrient needs of plants;*

(3) *Increasing the percentage of water and nutrients entering the plant root zone;*

(4) *Reducing the amount of leachate or runoff; and*

(5) *Reducing or containing the flow of water from growing areas.*

*G. Program for Monitoring Runoff. A nutrient management plan shall include recommendations to monitor runoff, as required in Regulation .07C of this chapter, including recommendations on methods, frequency, and locations of monitoring.*

*H. Plan Maintenance. A plan shall contain information to maintain and update the plan. General comments about plan maintenance may be summarized, but shall include:*

(1) *The length of time the plan is effective, not to exceed 3 years; and*

(2) *Identification of changes in the agricultural operation that would require the original plan to be modified or updated, including a:*

(a) *Change in area managed of 20 percent or greater, or 5 acres, whichever is less, or*

*(b) Substantial change in a production plan or method.*

**.12 Nutrient Management—Required Plan Recommendations for Container or Out-of-Ground Production.**

*A. Nutrient Recommendations. A certified nutrient management consultant or certified farm operator shall evaluate production cycles and methods and make nutrient recommendations based on at least one of the following:*

*(1) The label recommendations on fertilizer products for the plants being grown or similar plants;*

*(2) The recommendations of the University of Maryland Cooperative Extension for the specific plants being grown or for similar plants;*

*(3) The recommendation from other state universities for the specific plants being grown or for similar plants;*

*(4) The data from research done by accredited universities on the specific plants being grown or similar plants;*

*(5) The general nutrition guidelines for similar plants; or*

*(6) Any generally accepted growing practices for plants under comparable growing conditions.*

***B. Management Recommendations.***

*(1) A consultant or certified farm operator shall use the Environmental Risk Assessment for out-of-ground production, as provided in the Maryland Nutrient Management Manual, Section II-D, to identify the potential risk to the environment of nutrient movement from out-of-ground growing areas.*

*(2) For growing areas where there is zero or low risk of nutrient movement from the site, recommendations shall be made to maintain this zero or low level of risk.*

*(3) For growing areas where there is medium risk of nutrient movement:*

*(a) Management recommendations shall be made to minimize the risk of nutrients moving to, or reaching, surface waters; and*

*(b) The consultant or certified farm operator shall recommend that the operator or other person responsible for irrigation and nutrient management attend Department-approved training on best management practices for out-of-ground production to minimize nutrient losses.*

*(4) For growing areas where there is high risk of nutrient movement:*

*(a) Management recommendations shall be made for individual growing areas, as well as for the operation as a whole, to reduce the risk of nutrients moving to, or reaching, surface waters;*

*(b) The consultant or certified farm operator shall recommend that the operator or other person responsible for irrigation and nutrient management attend Department-approved training on best management practices for out-of-ground production that teaches how to minimize nutrient losses; and*

*(c) Only controlled release fertilizer shall be recommended for use until management changes reduce the risk of nutrient loss to medium.*

*(5) In recommending field or management unit practices to reduce or minimize nutrient losses, a consultant or certified farm operator shall consider the following:*

*(a) The appropriate nutrient application methods;*

*(b) Nutrient application timing; and*

*(c) Any plant nutrient needs.*

*(6) Timing of nutrient application shall be as close to plant nutrient uptake as possible, except in the case of controlled release fertilizer, which may be applied at any time.*

*C. Recommendations for Monitoring Runoff. Unless an operation is assessed as zero risk for nutrient loss from the site, as provided in the Maryland Nutrient Management Manual, Section II-D, the nutrient management consultant shall recommend a monitoring program, including the following:*

*(1) The periods for monitoring when plant nutrients can reasonably be expected to be available;*

*(2) The locations immediately next to growing areas or areas where runoff or overflow from collection basins enters surface water, municipal stormwater, or drainage inlets; and*

*(3) The frequency of sampling for nutrients:*

*(a) Where the risk of nutrient movement from any growing area is low, monitoring shall include samples for testing a minimum of two different times during each growing season or cycle from each location; and*

*(b) Where the risk of impacting surface water is medium or high, monitoring recommendations shall be conducted monthly when nutrients are being applied.*

*D. Methods of Sampling and Testing. Samples may be analyzed by the operator or consultant on-site using calibrated electrical conductivity (EC) or nutrient meters. To evaluate the accuracy of on-site test results, at least two samples per year shall be split, with one part being sent to an independent laboratory for analysis.*

