



COMMONWEALTH of VIRGINIA

Chesapeake Bay TMDL Phase I Watershed Implementation Plan

*Revision of the Chesapeake Bay Nutrient
and Sediment Reduction Tributary Strategy*

September 2010

Public Review Draft

Preamble to Virginia's Draft Phase 1 Watershed Implementation Plan

The Chesapeake Bay is truly a national treasure and an ecological wonder. As Virginians, we have an obligation to protect this incredible resource, and we are all committed to ensuring a clean and vibrant Chesapeake Bay for future generations to enjoy and cherish.

Virginia Governor Robert F. McDonnell recognizes the work of all federal and state agencies involved and thanks these dedicated teams for their hard work.

What follows is the Phase I Draft Watershed Implementation Plan for the Commonwealth of Virginia. A broad group of stakeholders have been involved in the development of this draft, but the public at large has not had the opportunity to react to the significant issues and responsibilities contained in this document, so it is truly a draft. We will listen closely to the public over the next two months and this document will transform as we have the opportunity to consider the many comments we are sure to receive. This is a plan, and only a plan.

Governor McDonnell has expressed directly to the Administrator of the U. S. Environmental Protection Agency, his concerns about the process, cost, legality, allocations, and compressed timing in the development of this plan. Having only received our nitrogen and phosphorous allocations July 1, and sediment allocation August 13, it is difficult to develop a comprehensive plan such as this that may have an impact through 2025.

EPA asserts that it must develop the Bay TMDL by December 2010 pursuant to the requirements of the Consent Decree entered in the case American Canoe Association et al. v. the United States EPA, 54F. Supp. 2d 621 (E.D. Va. 1999). We note, however, that Virginia was not a party to that case, and the Consent Decree established a deadline of May 2011 for the EPA to establish TMDLs for certain identified Virginia waters and pollutants if Virginia had not done so itself. We also note that, although the EPA repeatedly refers to its "expectation" that Bay jurisdictions will develop WIPs and submit them to the EPA for approval, EPA in its December 2009 letter to the Commonwealth indicated the extensive actions it is willing to take to compel Virginia to develop and implement an "appropriate" WIP and meet the EPA's compressed timeline.

It is important to emphasize that this plan is being developed during the worst economy in a generation. This draft plan takes into account the billions of dollars Virginians have already invested in Chesapeake Bay water quality to date. Full implementation of this plan will likely cost billions of new dollars which could be unfunded mandates on the state, localities, private industries and homeowners. For example, Virginia's largest industry, agriculture, alone may face huge new costs (estimated \$800 million) for conservation practices like livestock exclusion stream fencing. In these austere times, we cannot guarantee additional funding will be provided by our General Assembly. It is our position that the success of the draft WIP may be largely subject to the provision of sufficient federal funding to assist in covering these massive costs.

Virginia will move forward with the implementation of this plan with a clear focus on flexibility and cost-effectiveness. For instance, it is our fundamental belief that an expanded nutrient credit exchange program will afford the same approach to other sectors, particularly urban stormwater and septic systems, and it will allow for decisions to be made across sectors in an orderly and

cost-effective manner. Therefore, Virginia will rely on principles of adaptive management, taking advantage of new technology and low cost methods to achieve our goals.

A significant concern is the nearly absolute reliance on modeling rather than looking directly at outcomes in the Bay. While this model has seen years of development it continues to experience fundamental flaws that call its credibility into question. Similarly we are convinced that the manner in which it has been used for this Bay-wide TMDL assumes a level of precision far beyond what the model is capable of and without regard for the economic consequences. This “inputs based” rather than “outputs based” approach hurts the credibility of the overall effort.

We have also taken steps that propose a different approach for the James River. Because of its geographic location, the James has less impact on the water quality of the mainstem of the Chesapeake Bay than any other river. The James also is unique because of the chlorophyll standards that were adopted in 2005 with the concurrence of EPA. We believe that because sufficient new information is available for the James River, we should take the time necessary to review the James River numeric chlorophyll standards to ensure that they reflect the best science and regulatory approaches. Therefore, we have included a detailed plan to accomplish this review and amend standards if necessary prior to the scheduled revision of the TMDL in 2017. Our plan demonstrates that we will meet the 2017 target loads prescribed by EPA in all basins, including the James.

Based on all these issues, Virginia reserves the right to unilaterally adjust this plan based on new information such as conservation efforts currently implemented but not accounted for in this model, adverse economic impacts on business, funding availability from federal sources in particular, and improved scientific methodologies.

Our work will not end with the submission of this draft Watershed Implementation Plan. We will continue to work with stakeholders and with the public to ensure that our implementation improves water quality in a manner that is sensible, fair and cost effective as this process unfolds over the next 15 years.

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SECTION 1. VIRGINIA'S PLAN: OVERVIEW

This preliminary or Phase I Watershed Implementation Plan (WIP) has been developed by the Commonwealth of Virginia as required by the U.S. Environmental Protection Agency as an implementation plan for the Chesapeake Bay Total Maximum Daily Load (TMDL).

Background and Approach to WIP Development

The Chesapeake Bay TMDL WIP is a continuation of work begun with Virginia's Tributary Strategies in 2005. Adoption of the tributary strategies resulted in significant progress in a number of areas of point and nonpoint pollution control including:

- Establishment of first in the Chesapeake Bay watershed cap on nutrient loads from significant point source dischargers.
- Established nutrient credit exchange program that has been successful in ensuring orderly and cost-effective upgrades of sewage treatment plants.
- Expansion of nutrient management on a wide variety of land uses.
- Accelerated and focused agricultural cost-share program, including special emphasis given to "priority practices."
- Consolidated and strengthened stormwater management program
- Improved oversight and implementation of local erosion and sediment control and Chesapeake Bay Preservation Act programs
- Improved reporting of agricultural best-management programs to ensure full credit is given
- Improved reporting of stormwater management practices.

This plan charts out actions necessary to achieve the Chesapeake Bay TMDL allocations between now and 2025 with the greatest emphasis on actions planned between now and 2017. It incorporates the principles of adaptive management so that the success or failures of actions can be evaluated and adjustments to programs and strategies are made. This plan incorporates the experience of tributary strategy development along with new knowledge and new tools.

The WIP addresses shortcomings in available data or in our ability to analyze data where this is an issue. The actions proposed will be based on the best available science and data, but we expect the base of knowledge and information to expand and to make adjustments accordingly in consultation with affected stakeholders and the Environmental Protection Agency (EPA). Virginia is also bound by the provisions of state law that require cost evaluations along with a benefit analysis for implementation plans. Adjustments will be considered based on cost effectiveness and other key factors.

Although the Chesapeake Bay TMDL is often discussed and thought of conceptually as a single TMDL, it is comprised of 92 segments. Virginia contributes drainage to 39 segments within the watershed. All 39 segments are listed as impaired for excessive nutrients and sediments.

The WIP contains pollution loads allocated or assigned to different source sectors of nitrogen, phosphorus and suspended solids. These sectors include wastewater treatment plants, agriculture,

forest, urban stormwater, onsite/septic and air sources that contribute to the nutrient and sediment (also referred to in this document as total suspended solids or TSS) problems of the Chesapeake Bay. The plan also provides broad strategies proposed to meet those allocations. In accordance with federal expectations, those strategies and contingencies included in the plan are intended to meet reasonable assurance requirements for the Chesapeake Bay TMDL. This is a plan and does not confer any additional regulatory or legal authority to governmental agencies. Any programs or strategies that are not currently authorized by state law may be pursued through the legislative process or through the Virginia Administrative Process Act.

Guiding Principles for Virginia's Watershed Implementation Plan

- Equity: This plan seeks to approach each sector with significant but achievable actions in a way that all sectors share in meeting TMDL allocations.
- Cost-effectiveness: This plan charts out actions and timeframes in a manner that emphasizes cost effective practices. It plans actions in a step-wise fashion over time to allow for less costly actions to be taken first, before more expensive actions are conducted. This plan also proposes an expanded use of the Nutrient Credit Exchange or other offset mechanism to allow for flexibility in meeting reduction targets and TMDL allocations.
- Credit Past Progress: Nutrient and sediment reduction in the Chesapeake Bay watershed does not begin with this plan. Nutrient reduction has been taking place in a significant fashion for more than a decade. This plan recognizes the significant progress made and the relative progress among sectors.
- Reasonableness and Feasibility to Implement: This plan attempts to set high expectations for practices that are likely to be implemented across all sectors, not simply those that are theoretically possible but are not reasonable to expect given significant technical, legal or financial barriers.
- Meeting EPA's Reasonable Assurance: EPA has advised that any plans submitted must meet the so-called "reasonable assurance" test. While there is some uncertainty to the meaning of that term, this plan includes necessary references to existing authority and means of implementation. For example, in cases where action requires additional legal authority, Virginia will chart a path for seeking such authority.
- Incorporating Future Actions: Allocations will be set at a level that presumes expected reductions from new and enhanced programs with the recognition that if such programs fail, the plan will be revisited and alternatives pursued.
- Course Correction in 2017: The plan is written knowing that new information and technologies will be available in the future, especially post-2017. EPA has established 2017 as an important date on the path to full implementation by 2025. It will be an opportunity to evaluate the significant actions that have taken place and re-evaluate the TMDL allocations

based on changing conditions, new science and new technology. Therefore, this plan is less specific for actions in the post 2017 timeframe.

- Determine Best Use of Trading, Credits and Nutrient Exchanges: EPA has encouraged the states to consider exchanges of allocations between basins, and Nitrogen and Phosphorus exchanges within a basin to provide a more reasonable, cost-effective WIP for the Commonwealth. We have therefore included the use of the existing Nutrient Credit Exchange program to ensure that targets are met over the 15 year implementation period of the TMDL. See the next section for a full description of the proposal for a broader use of the nutrient credit exchange program.
- High Expectation for Federal Lands: Federal facilities in Virginia have made great strides in Chesapeake Bay protection. This plan presumes, as articulated in Executive Order 13508, that federal lands will receive treatment at extremely high levels.

Role for an Expanded Chesapeake Bay Watershed Nutrient Credit Exchange Program

In 2005 the Commonwealth took a major step in protecting the Chesapeake Bay by establishing the Chesapeake Bay Watershed Nutrient Credit Exchange Program (Code of Virginia at §62.1-44.19:12). The General Assembly determined that adoption and utilization of a watershed general permit and market-based point source nutrient credit trading program would assist in: (a) meeting pollution reductions and cap load allocations cost-effectively and as soon as possible in keeping with the 2010 timeline and objectives of the Chesapeake 2000 Agreement, (b) accommodating continued growth and economic development in the Chesapeake Bay watershed, and (c) providing a foundation for establishing market-based incentives to help achieve the nonpoint source reduction goals.

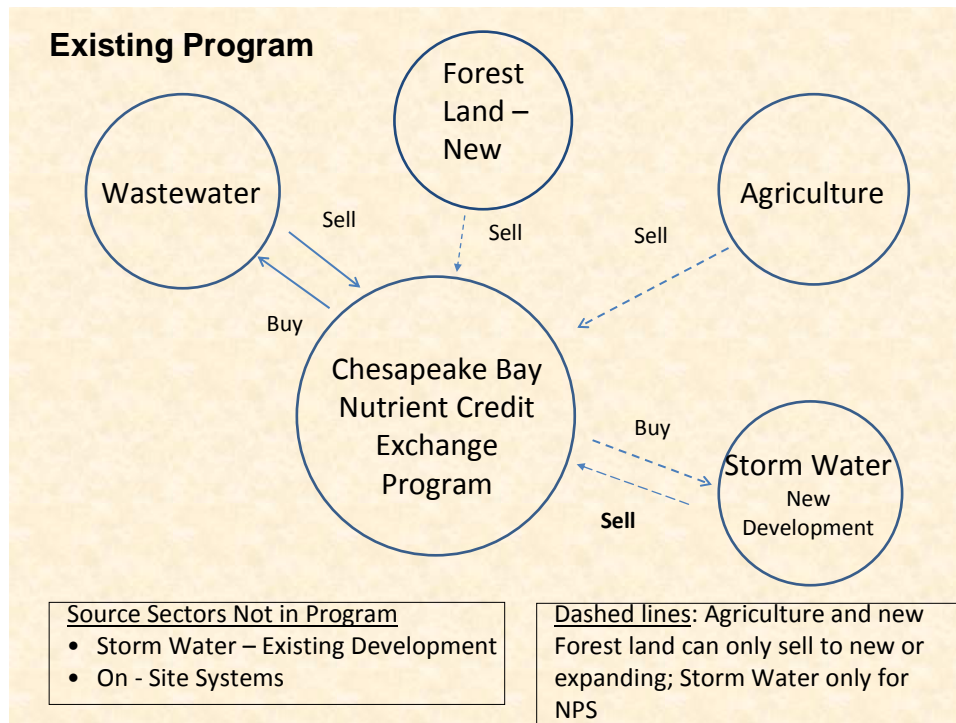
An investment of over \$1.5 billion in implementing this program over the past five years has enabled the Commonwealth to achieve significant reductions in nutrient loads discharged to the Chesapeake Bay from Virginia's municipal and industrial wastewater treatment facilities. The Commonwealth is recognized nationally for having one of the most robust, comprehensive, and successful credit exchange programs. Additional information about this program can be found at the following websites:

<http://www.deq.virginia.gov/vpdes/nutrienttrade.html>
<http://www.theexchangeassociation.org/Default.htm>

In 2009, the General Assembly expanded the Commonwealth's nutrient offset program by amending the Code of Virginia to allow for a stormwater nonpoint nutrient offsets program for new development.

Overview of the Existing Nutrient Credit Exchange Program

The diagram below illustrates the relationship of the current nutrient credit exchange program to the major source sectors of nutrients receiving allocations under the TMDL:



- **Wastewater** – full participation in program; have options of either installing additional nutrient removal facilities or buying credits; facilities performing better than their allocations may sell credits in the market.
- **Storm Water [New Development]** – participation in program is limited to new development and to securing non-point source offsets when on-site practices cannot achieve sufficient pollution reductions.
- **Agriculture and Forest Land** – may sell credits to new or expanding wastewater treatment facilities or new development if the agriculture lands or newly created forest area meet established “baselines” of management practices.
- **Storm Water [Existing Development] and On-Site Systems** – not currently allowed to participate in program.

Need for an Expanded Nutrient Credit Exchange Program

When the Chesapeake Bay TMDL is issued, about half the land area of the Commonwealth will be under nutrient and sediment load allocations that cap the discharge of these pollutants from point and non-point sources. Unless changed, these pollutant allocations will become permanent pollutant caps on each of the major Virginia Bay river basins that all the source sectors, added together, cannot exceed. In order to help meet the challenging pollution reduction requirements imposed by the Bay TMDL, this Phase 1 WIP recommends the Commonwealth expand the nutrient credit exchange program to better ensure that future nutrient and sediment reduction

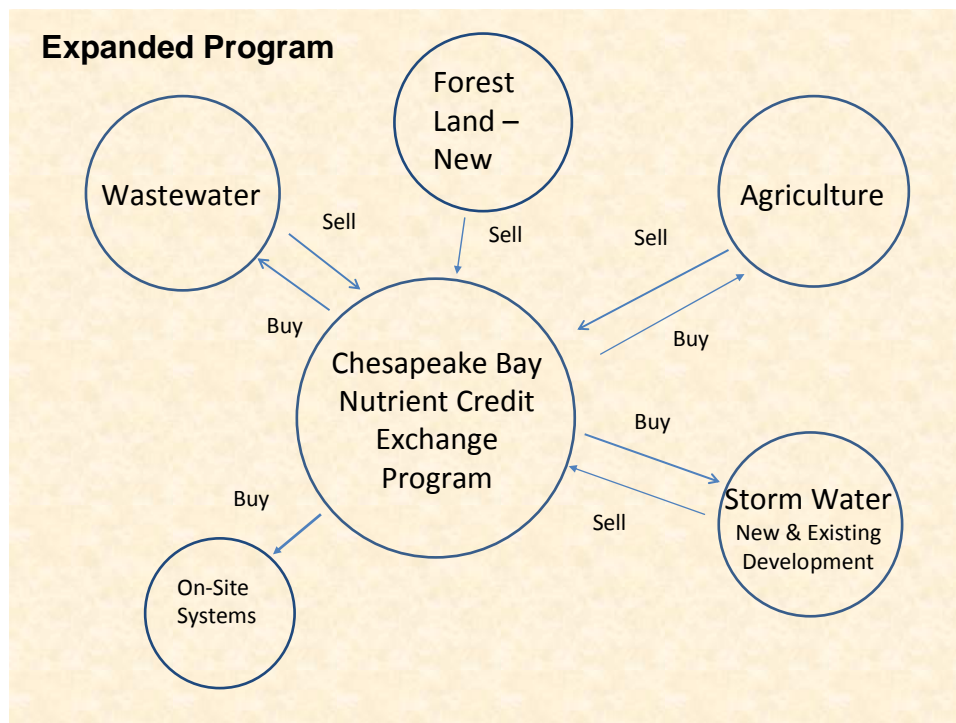
actions are as equitable and as cost-effective as possible among all of the source sectors. An expanded program also allows local decision-makers to consider nutrient and sediment generating potential as they face development, land use, and capital planning challenges.

A Proposed Framework for an Expanded Nutrient Credit Exchange Program

General Assembly action is needed to expand the program to allow full participation of wastewater, storm water, and on-site systems in the program.

The source sector allocations included in this Phase 1 WIP are based upon a functioning and viable expanded nutrient credit exchange program. The 2025 TMDL nutrient allocations are shown in the tables at the end of this section. For implementation purposes in Virginia, the allocations for the three source sectors directly involved in the proposed expanded program - - wastewater, storm water and on-site systems - - are shown in aggregate since an expanded credit exchange would provide attainment options outside of sole reliance on sector specific best management practices (BMPs).

Other source sector tables in this WIP present the allocations by individual source sector; these are being submitted to EPA for purposes of model verification that the TMDL allocations are attained. We recognize that the individual source sector allocations in those tables are much lower than can be feasibly attained relying solely on the BMPs applied in that sector. Attainment of these allocations is envisioned using the expanded offset options that would be part of a revised nutrient credit exchange. The framework for an expanded nutrient credit exchange program is shown in the diagram below.



- **Wastewater** – increases the potential market for sellers to provide credits to sectors whose costs are much higher.

- **Storm Water** – provides additional source of cost-effective offsets, particularly for localities to exchange between their wastewater and storm water systems.
- **Agriculture and Forest Land** – expands market for selling credits if land area managed meets baseline criteria.
- **On-Site Systems** – as new systems are installed, localities have options to secure credits, either within locality boundaries or through broader credit exchange.

Benefits of an Expanded Program

- Pollution reductions will be achieved at a potentially lower cost.
- An expanded program allows for the citizens of the Commonwealth to determine the priority for what nutrient reduction actions need to be taken and by when.
- An expanded credit exchange program spreads out financial investments over a longer period, thereby allowing Virginia to invest limited resources over the short term in sectors where most needed.
- An expanded credit exchange also provides greater flexibility for decision making at the local level among the wastewater, storm water and on-site sectors.

The specific details of an expanded nutrient credit exchange will be developed through the legislative and regulatory processes of the Commonwealth.

Sector Nutrient Allocations for 2025 Based Upon Expanded Credit Exchange

The following tables present the nutrient allocations for each major river basin by major source sector.

Table 1.1: VIRGINIA CHESAPEAKE BAY TMDL ALLOCATIONS

NITROGEN - 2025 [Million Pounds/Year]

THESE SECTOR ALLOCATIONS WILL BE REVIEWED/ADJUSTED IN 2017

Source Sector	Potomac	Rapp	York	James	E Shore	VA TOTAL
Agriculture	6.979	2.787	1.548	4.171	0.906	16.391
Urban Runoff ¹	2.269	0.167	0.329	1.100	0.050	3.915
Wastewater ¹	3.756	0.593	1.193	14.770	0.082	20.394
On-Site ¹	0.597	0.322	0.487	0.440	0.076	1.922
Forest	4.122	1.898	1.764	5.993	0.162	13.939
Non-Tidal Dep	0.102	0.073	0.089	0.316	0.032	0.612
Total	17.825	5.840	5.410	26.790	1.308	57.173
Draft	17.46 ²	5.840	5.410	23.480 ⁴	1.210 ³	53.400 ⁴
Allocations	17.825				1.308	

¹Allocations for these source sectors can be attained through expansion of the VA Nutrient Credit Exchange Program

²For Potomac, a portion of the TP allocation is transferred to the TN allocation using 1:5 ratio [added 365,000 lbs/yr of TN]

³For E Shore, a portion of the TP allocation is transferred to the TN allocation using 1:5 ratio [added 98,000 lbs/yr of TN]

⁴Refer to James River Strategy section of the WIP for Virginia's approach to conform with EPA's draft July 1 TMDL allocations by 2025; allocation adjustments will be made, as warranted, in 2017 following completion of scientific review of chlorophyll standards

Table 1.2: VIRGINIA CHESAPEAKE BAY TMDL ALLOCATIONS

PHOSPHORUS - 2025 [Million Pounds/Year]

THESE SECTOR ALLOCATIONS WILL BE REVIEWED/ADJUSTED IN 2017

Source Sector	Potomac	Rapp	York	James	E Shore	VA TOTAL
Agriculture	0.638	0.555	0.175	0.678	0.100	2.146
Urban Runoff ¹	0.267	0.079	0.025	0.150	0.009	0.380
Wastewater ¹	0.280	0.069	0.199	1.276	0.008	1.832
On-Site ¹	0.000	0.000	0.000	0.000	0.000	0.000
Forest	0.204	0.185	0.131	0.555	0.015	1.090
Non-Tidal Dep	0.008	0.007	0.010	0.031	0.002	0.058
Total	1.397	0.895	0.540	2.690	0.134	5.656
Draft	1.470 ²	0.900	0.540	2.340 ⁴	0.160 ³	5.410 ⁴
Allocations	1.397				0.140	

¹Allocations for these source sectors can be attained through expansion of the VA Nutrient Credit Exchange Program

²For Potomac Basin, a portion of the TP allocation is transferred to the TN allocation using 1:5 ratio [removed 73,000 lbs/yr from TP]

³For E Shore, a portion of the TP allocation is transferred to the TN allocations using 1:5 ratio [removed 19,600 lbs/yr from TP]

⁴Refer to James River Strategy section of the WIP for Virginia's approach to conform with EPA's draft July 1 TMDL allocations by 2025; allocation adjustments will be made, as warranted, in 2017 following completion of scientific review of chlorophyll standards

Table 1.3: VIRGINIA CHESAPEAKE BAY TARGET LOADS

NITROGEN - 2017 [Million Pounds/Year]

Source Sector	Potomac	Rapp	York	James	E Shore	VA TOTAL
Agriculture	7.750	3.006	1.841	4.680	1.112	18.389
Urban Runoff ¹	2.730	0.425	0.471	2.700	0.054	6.380
Wastewater ^{1, 3}	3.312	0.551	0.977	11.441	0.078	16.359
On-Site ¹	0.724	0.383	0.578	1.110	0.076	2.871
Forest	4.122	1.898	1.764	5.993	0.162	13.939
Non-Tidal Dep	0.102	0.073	0.089	0.316	0.032	0.612
Total	18.740	6.336	5.720	26.240	1.514	58.550
Target Loads²	18.740	6.300	5.810	26.240	1.545	59.040

¹Allocations for these source sectors can be attained through expansion of the VA Nutrient Credit Exchange Program

²Draft Target Loads for each basin set at 60% of 2025 Allocations; each sector may vary.

³Wastewater loads are expected to be below 2025 allocations which will aid in meeting the Commonwealth's 2017 target loads

Table 1.4: VIRGINIA CHESAPEAKE BAY TARGET LOADS

PHOSPHORUS - 2017 [Million Pounds/Year]

Source Sector	Potomac	Rapp	York	James	E Shore	VA TOTAL
Agriculture	0.775	0.617	0.205	0.800	0.110	2.507
Urban Runoff ¹	0.288	0.091	0.092	0.563	0.009	1.044
Wastewater ^{1,3}	0.254	0.06	0.142	0.775	0.007	1.238
On-Site ¹	0.000	0.000	0.000	0.000	0.000	0.000
Forest	0.204	0.185	0.131	0.556	0.015	1.091
Non-Tidal Dep	0.01	0.01	0.01	0.03	0.000	0.060
Total	1.531	0.963	0.580	2.724	0.141	5.940
Target Loads²	1.610	0.980	0.580	2.724	0.141	6.035

¹Allocations for these source sectors can be attained through expansion of the VA Nutrient Credit Exchange Program

²Draft Target Loads for each basin set at 60% of 2025 Allocations; each sector may vary.

³Wastewater loads are expected to be below 2025 allocations which will aid in meeting the Commonwealth's 2017 target loads

Contingency

If the General Assembly decides that an expanded the nutrient credit exchange program as envisioned in this Phase 1 WIP is not suitable for the Commonwealth, then the basis for the source sector allocations included in this WIP is no longer supported and those allocations will be adjusted and modifications will be made to the WIP to provide reasonable assurance of attainment.

Public Participation

Public participation in the TMDL process was initiated through five EPA sponsored public meetings held on December 14-17, 2009. More than 600 people attended Virginia meetings held by the EPA to provide information on the Chesapeake Bay TMDL development. EPA representatives reviewed the Chesapeake Bay TMDL and EPA expectations. Representatives from the Department of Conservation and Recreation (DCR) and Department of Environmental Quality (DEQ) gave an overview of Virginia’s approach to developing the Chesapeake Bay Watershed Implementation Plan. Virginia staff has also presented updates in EPA’s periodic webinars held during 2010.

Public announcements and requests have been distributed through several internet based applications. DCR, DEQ and EPA’s websites serve as the primary information portal for the process in Virginia.

Use and Limitations of the Chesapeake Bay Model

The TMDL is developed using the Chesapeake Bay model which allows for evaluation of implemented and proposed actions. While meeting the requirements of the model are important

in order to meet the technical elements of the TMDL, our focus is on implementing practices and programs that result in real environmental improvement. We will use the model as a management tool, but we will tailor our actions within real scientific, economic, social and political frameworks.

The Chesapeake Bay watershed model is not a perfect representation of actual conditions on the landscape. Rather, it is a rough approximation. As such, we will continue to work with EPA to improve the model and use an adaptive management approach to adjust strategies as necessary based on those improvements. EPA has already committed to fix two known flaws that could result in changes to the strategies articulated in this document. We will also continue to provide EPA with our best information to ensure that the proper uses and limitations of the model are understood by citizens and stakeholders.

Stakeholder Engagement and the Stakeholder Advisory Group

The Secretary of Natural Resources formed an advisory group to assist in developing Virginia's plan to implement the Chesapeake Bay TMDL. The Stakeholder Advisory Group (SAG) provides a forum for discussion during the development of the Chesapeake Bay TMDL and the WIP. Virginia's approach to engaging a wide variety of interested parties through the SAG resulted in critical feedback on the model inputs, outputs, and the abilities to implement a host of practices across Virginia's bay watershed. The SAG met on December 17, 2009 and February 26, June 15 and August 24, 2010. Members reviewed and advised on sector pollutant load reductions and the sector allocations that will be used to meet the interim and final goals. The SAG's construct was adjusted to include four source sector Workgroups. These workgroups evaluated additional scoping scenario inputs and model results and discussed and proposed various approaches to further address the allocations for agriculture, forest, urban sources, septic systems and wastewater. Workgroups met two times each and included Onsite/Septic (July 15 and 26), Wastewater Treatment (July 6 and 19), Urban/Suburban Stormwater (July 12 and 28) and Agriculture and Forestry (July 8 and 21).

Source Sector Strategies

For each of the source sectors, it is presumed that existing programs and authority will continue.

Wastewater

TMDL waste load allocations (WLAs) for Significant Municipal and Industrial Facilities are set in two existing regulations: Water Quality Management Planning Regulation (9 VAC 25-720) and Chesapeake Bay Watershed General Permit Regulation (9 VAC 25-820). These are enforceable provisions that "cap" the dischargers' total nitrogen (TN), total phosphorus (TP) and sediment loads (TSS), and allow for nutrient credit exchange to achieve compliance with regulatory requirements. Allocations for sediment loads will be set at technology levels since wastewater is an insignificant portion of the sediment load. WLAs for Non-significant Municipal and Industrial Facilities will be set at levels consistent with the procedure outlined in the Code of Virginia, which establishes the 2005 loads as the levels that cannot be exceeded in the future. Combined Sewer System allocations should be set for communities with combined sewer systems (CSS) at Long Term Control Plan (LTCP) levels with adjustments for future urban stormwater retrofits that may reduce the amount of loadings from CSS.

For existing small dischargers expanding to less than 40,000 gallons per day (gpd):

- Consider revisions to the Code of Virginia to set allocations based on existing design capacity.

For small dischargers less than 1,000 gpd (SFH, Single Family Homes) and new industrial dischargers less than 40,000 gpd:

- Provide allocations in TMDL for all existing and new SFH under 1,000 gpd and industrial dischargers less than 40,000 gpd
- Consider revisions to the Code requiring new SFH and industrial facilities less than 40,000 gpd to secure offsets for all of their discharged loads.

Onsite/Septic

Set the onsite/septic TMDL allocation based on 2009 progress as determined by the Chesapeake Bay Program model with the following adjustments: the projected number of connections of existing systems to sewage treatment plants and estimated numbers of tanks that will be pumped within areas in Eastern Virginia designated as Chesapeake Bay Preservation Areas (pumpout once every five years) and estimated level in areas not subject to the Chesapeake Bay Preservation Act (pumpout once every 15 years.) This plan attempts to reduce the rate of growth in this sector and proposes to offset new loads through an expansion of the Nutrient Credit Exchange Program.

- Implement amendments to Virginia Department of Health regulations for alternative systems (currently under revision)
- Consider revisions to the Code of Virginia to require all new and replacement systems in the Chesapeake Bay watershed to utilize either: (1) “shallow-placed” systems capable of reducing nitrogen loss (2) denitrification technology to reduce nitrogen loss
- Consider requirements for additional nitrogen reducing technologies in certain defined sensitive areas
- Consider revisions to the Code of Virginia to encourage the use of community onsite systems
- Expand the Nutrient Credit Exchange Program to include on-site systems and allow offsets of new septic loads or participation in offsetting increased nitrogen loads from additional on-site systems from other areas within the Chesapeake Bay watershed
- Explore the feasibility of establishing tax credits or other financial incentives for upgrade/replacement of existing conventional systems with nitrogen reducing systems
- Explore the use of grants or other methods to defray expenses on low and moderate income households
- Encourage the use of “Betterment Loans” for repairs to existing systems.

Agriculture

Allocations are set for unregulated agricultural operations at levels resulting from significantly expanded implementation of conservation and nutrient management plans addressing the application of nutrients, tillage methods, cover crops, retention or establishment of buffers and exclusion of livestock from streams. It is the expectation of this plan that these practices will be widely implemented on agricultural lands. WLA allocations for Concentrated Animal Feeding Operations (CAFOs) are set according to EPA guidance and adjusted to reflect Virginia data with the WLA based on full implementation of practices such as adequate waste storage and barnyard runoff controls.

- Implement nutrient management plans on most crop and hay acres.
- Implement 35' grass or forest buffers between cropland and perennial surface waters.
- Achieve near total stream exclusion of livestock overtime.
- Improve tracking of voluntary agricultural and forestry BMPs.
- Account for all current mandated practices in Concentrated Animal Feeding Operations (CAFO) and permits required for certain poultry operations.
- Provide cost-share funding to achieve significant acreage of cover crops and other incentive based practices.
- Increase installation and management of animal waste management systems for confined livestock.
- Expand available technical assistance to support adoption of agricultural practices.

Urban Stormwater

Loads from stormwater will be expressed as both waste load allocations (for regulated activities) and load allocations (for unregulated stormwater). Allocations for newly developed land will be set at a level that results in no increase above allowable 2025 average nutrient loads per acre from previous land uses; unless offsets are obtained in the event on-site controls will not fully achieve allowable loads. Allocation for existing urban areas is based on high levels of implementation of management practices described below. These post 2017 activities presume an expansion of the Nutrient Credit Exchange Program and therefore the urban sector loads have been “bundled” with the wastewater and onsite septic loads for the purposes of this plan.

- Revise Virginia’s Stormwater Management Regulations to prevent loads increases from new development (currently under revision).
- Restrictions for application of non-agricultural fertilizers and reporting from “for-hire” applicators.
- Encourage all municipal/county owned nonagricultural lands receiving nutrients to develop, implement and maintain nutrient management plans.
- Consider controls on certain do-it-yourself non-agricultural lawn and turf fertilizers.
- Incorporate requirements within Virginia’s Stormwater Management Regulations (under revision) that redevelopment meet reductions in nutrient and sediment loads.

- Implement additional BMPs on existing pervious and impervious lands through future permits and wider adoption of stormwater utility fees or other funding mechanisms.
- Implement a significantly expanded urban nutrient management program.

James River

This plan proposes a different approach for the James River given its unique qualities and the chlorophyll standards that apply only to the James.

In 2005 the State Water Control Board adopted several regulations to address the nutrient and sediment impairments in Virginia's portion of the Chesapeake Bay and its tidal rivers, including the James River. In March 2005, the State Water Control Board adopted water quality standards to protect the Chesapeake Bay and tidal rivers; these standards included five new designated uses, numeric criteria for dissolved oxygen, submerged aquatic vegetation and water clarity, and a narrative chlorophyll criterion. Action on numeric chlorophyll criteria for the tidal James River was delayed to give further consideration to public comments and to develop nutrient loading and cost alternative analyses. The Board considered the James River chlorophyll criteria at their June 2005 meeting, and adopted criteria at their November 2005 meeting.

Concurrent with these actions, the Board also amended the Virginia Water Quality Management regulation to include nitrogen and phosphorus allocations for 125 significant wastewater dischargers throughout the Bay watershed that would, along with needed actions by non-point sources, achieve all of the new water quality standards.

Determining the appropriate numeric chlorophyll criteria for the tidal James River was particularly challenging and the rulemaking process included an additional step of using consideration of attainability to help determine the proper criteria since the other lines of evidence did not clearly point to specific and defensible criteria levels. EPA worked with Virginia on these regulations and approved them as meeting the requirements of the Clean Water Act. Virginia immediately began an aggressive program to implement nutrient reductions from point and nonpoint sources, including expenditures and commitments to add nutrient removal facilities at wastewater treatment plants, alone exceeding \$1.5 billion. Of this amount, over \$400 million has been directed to the James River basin. Localities and industries in the James River basin have developed their regulatory compliance plans and made long-term funding commitments based on the approved regulations.

Recent determinations by EPA during the Chesapeake Bay TMDL development process call into question the conclusions and agreements reached during Virginia's 2005 rulemaking process for the chlorophyll criteria. The draft nutrient allocations for the James River basin issued by EPA on July 1, 2010 are significantly more stringent than the levels that formed the basis for the state regulatory actions taken in 2005 for the chlorophyll criteria and the wastewater treatment plant allocations. Achieving these more stringent allocations would require estimated additional expenditures of between \$0.5 to 1.0 billion to the restoration costs in the James basin. In addition, technological advancements since 2005 in field monitoring for the chlorophyll parameter provide a much greater understanding of the concentrations and variability of chlorophyll in the tidal James River. These advancements include "data-flow" monitoring which

provides thousands of data points during a single monitoring cruise. Additional scientific research has since taken place, providing a greater understanding of the impact of algae blooms on aquatic life. Also, EPA has recently issued criteria to protect against Harmful Algal Blooms that should be evaluated for application in the tidal James River.

The Commonwealth views the draft nutrient allocations included in EPA's July 1, 2010 letter for the James River basin to be at the lower end of a range of nutrient loads allocations needed to protect the aquatic life uses in the tidal James River. The Commonwealth concludes that additional scientific study is needed to provide a more precise and scientifically defensible basis for setting the final nutrient allocations.

Four Part James River Strategy

Part 1: Continue Pollution Reduction Actions During Stage 1 of TMDL Implementation to Achieve the 60% Reduction Target by 2017

- The Commonwealth will continue aggressive implementation of the nutrient and sediment reduction practices outlined in other sections of this WIP.
- EPA's expectation is that by 2017 Virginia will attain 60% of the reductions needed to achieve the July 1, 2010 draft nutrient allocations in the James River basin. Tables shown in another section of this WIP assign target loads to each of the major sectors to illustrate how the Commonwealth will meet the 60% target in the James by 2017.
- The capacity in these wastewater treatment plants to serve future growth will be used post-2017. The expansion of the nutrient credit exchange program will allow local decision-makers to determine how future nutrient reductions are best achieved equitably and cost-effectively among the source sectors in their communities. Source sector allocations included in this Phase 1 WIP reflect this more flexible approach available through an expanded credit exchange program.
- By attaining the 60% target in the James, the Commonwealth will achieve the James River Basin portion of the overall nutrient loading reductions needed to achieve the dissolved oxygen standards for the Chesapeake Bay.

Part 2: Conduct Additional Scientific Study to Determine the Most Appropriate Chlorophyll Criteria for the Tidal James River; and Initiate Rulemaking under the Virginia Administrative Process Act to Amend Water Quality Standards, as Needed

- New information must be evaluated to ensure the Commonwealth's chlorophyll criteria for the tidal James River are appropriately protective of the river's designated uses and are based on the best scientific information and data currently available. This new information includes: application of Harmful Algae Bloom criteria; analysis of data-flow monitoring information to better understand the size and duration of algal bloom events; scientific research; and other information supplied by citizens and stakeholders.
- In order to conduct a thorough review of available information, and to allow sufficient time for the collection of additional data-flow information in the tidal James River during various hydrologic seasons, we believe a three-year time period is needed to complete this study.

- In response to creditable findings from the three-year study, DEQ will ask the State Water Control Board to begin the rulemaking process under the Virginia Administrative Process Act to consider amending the chlorophyll criteria in the Water Quality Standards [9 VAC 25-260-310.bb.]. The time estimate for completing the Virginia rulemaking process is 18 to 24 months.
- The schedule described above, not to exceed five years, allows for production of revised chlorophyll criteria well within the time period for Stage 1 implementation of the Bay TMDL.
- As part of the review of the chlorophyll criteria, we will review the modeling framework used in predicting chlorophyll response to changes in nutrient and sediment inputs to the James River. The usefulness of the model can be improved by providing information on algae bloom events, both temporally and spatially, instead of long-term average chlorophyll concentrations.
- Attached to this Strategy is a draft Study Plan for this review and update of the James River site-specific numeric chlorophyll water quality criteria. DEQ welcomes comments on this draft plan as part of WIP review.

Part 3: Petition EPA to Amend TMDL Allocations for the James River Basin, as needed, in response to revised Water Quality Standards

- If revisions to the chlorophyll standards for the tidal James River are adopted, the Commonwealth will petition EPA to amend the TMDL nutrient allocations assigned to the James River basin.
- These revised basin allocations will form the basis for Virginia's Phase 3 WIP for the James River basin.

Part 4: Virginia Implements Necessary Management Actions during Stage 2 to Achieve TMDL Allocations Prior to 2025

- As stated previously, the Commonwealth believes that additional scientific study is needed to determine the proper chlorophyll standards for the tidal James River; and, the July 1 draft nutrient allocations are at the lower end of the range of loads needed to achieve the aquatic life use in the tidal James River.
- In recognition of this position, this Phase 1 WIP presents specific sector allocations and programs needed to meet the higher end of the range of nutrient loads we believe are needed to achieve the aquatic life use in the tidal James River.
- The Commonwealth remains concerned that the need to achieve additional reductions to meet the lower end of the nutrient load range has not been adequately justified. However, in the interest of providing a WIP without any gaps, additional management steps are identified that the Commonwealth would consider implementing after 2017 to meet EPA's July 1 draft nutrient allocations.
- These additional management steps include using a combination of the actions described below. Other actions would be considered based on new technologies and approaches developed in the future as well as the experience the Commonwealth gains during implementation of Stage 1 actions.

- Restoration of Oysters and other filter feeders**
 Increasing Virginia’s stock of natural filter feeders, such as oysters, not only provides a valuable fishery but will also help clean the James River by filtration. Various studies and EPA’s modeling have demonstrated that increasing the biomass of filter feeders may produce improvements. Virginia is committed to increasing the population of these natural filters and believes credit for filter feeder restoration and the associated nutrient removal should be recognized in implementing the James River TMDL.
- Reduction in Air Deposition**
 Modeling has estimated that atmospheric sources account for about one third of the nitrogen that reaches the Bay, and that much of this load originates from outside the Chesapeake Bay watershed. As described in general terms in EPA’s July 1 letter, additional nitrogen reductions realized through more stringent air pollution controls at the jurisdictional level, beyond minimum federal requirements, may be credited to individual jurisdictions.
- Implementation of Alternative Technologies**
 To achieve the additional nutrient reductions included in the draft TMDL equitably and cost-effectively, the Commonwealth will evaluate, and implement as appropriate and warranted, emerging alternative technologies that are shown to be effective. Examples of potential technologies that are being given serious consideration include Algal Turf Scrubber[®] and floating wetlands.
- Alternatives Identified During Stage 1 Cost-Benefit Study**
 The Commonwealth will be conducting a cost-benefit study to help inform the review of equitable and cost-effective sector allocations during the Phase 2 WIP process. As part of this James River strategy, the Commonwealth will build on this cost-benefit study to include evaluations of additional mechanisms and technologies that will be key to attaining the TMDL allocations in the James River during Stage 2 implementation. The James River component of this project will also provide cost-benefit information that will be useful during the Virginia rulemaking process directed at amending the chlorophyll standards.
- Once the scientific study and water quality standards rulemaking are completed, and nutrient allocations needed to meet these standards are established, the Commonwealth will review the sector allocations and propose needed adjustments in the Phase 3 WIP to meet the final James River basin allocations. In addition, these management approaches will be reviewed, along with other options, to develop equitable and cost-effective management actions to meet the TMDL allocations by 2025.

A detailed proposal for the scientific investigation of the chlorophyll standard is contained in Appendix 2