COMMONWEALTH of VIRGINIA

Office of the Governor

Doug Domenech
Secretary of Natural Resources

March 30, 2012

Mr. Shawn Garvin
Regional Administrator
U.S. EPA Region 3
1650 Arch Street (3PM52)
Philadelphia, PA 19103-2029

RE: Transmittal of Virginia's Final Phase II Watershed Implementation Plan

Dear Mr. Garvin:

On behalf of Virginia Governor Robert F. McDonnell, enclosed is Virginia's Phase II Watershed Implementation Plan (WIP). The Phase II WIP supplements the Phase I WIP and the activities already implemented in our efforts to reduce phosphorus, nitrogen, and sediment loads to the Bay.

Since the submission of our Phase I WIP in December 2010, we conducted numerous meetings with stakeholders, citizens and localities throughout the Chesapeake Bay watershed and encouraged active involvement in the development and implementation of the Phase II WIP.

During these meetings, we explained how the model represented land use, best management practice (BMP) implementation levels and loadings from each of the land uses at the local scale. We encouraged localities to be active partners in improving the land use information in the model, the TMDL and the WIP. We asked localities to provide more accurate local land use information, update BMP implementation progress, and, most importantly, develop strategies that could be implemented to meet the goals of the WIP.

Unfortunately, the time frame provided by EPA to complete the Phase II planning process was far too short for localities, individually or collectively, to finalize and gain approval from governing bodies on potentially expensive strategies and commitments. Despite these constraints, our efforts resulted in 95% of Bay watershed localities actively participating in the Phase II planning process and submitting some level of strategies, information or data in support of this Final Phase II document. There is no doubt that our outreach efforts resulted in local decision makers gaining a greater understanding of pollutant loadings from the land uses within their jurisdictions and an appreciation for their contribution to meeting the reduction goals included in the WIP.

The Commonwealth's Phase II plan, which reflects the inputs of Virginia's stakeholders and localities, as well as from EPA, provides a solid framework upon which we can build using the established 2-year milestone planning process. Our work will not end with the submission of our Watershed Implementation Plan. As local strategies are refined, endorsed, and scheduled for implementation, they will be included as elements in the applicable 2-year milestone plan. Through this structure, Virginia will move forward with the implementation of this plan with a clear focus on state and local partnership, flexibility and cost effectiveness. Virginia will also rely on principles of adaptive management, taking advantage of new technology and cost effective methods that may become available in the future in order to achieve our goals.

In addition to this plan, which is also being released for additional public comment, we are submitting today two provisional Phase II WIP input decks for 2025. These will join the provisional input decks provided with our final 2012-2013 milestones. A final submission of the model inputs for 2012-2013 milestones, 2017 and 2025 will be prepared based on our review of the model outputs on the provisional submissions and timely progress in the following areas:

1. It is imperative that the model anomalies affecting nutrient management plans be corrected before the Phase II WIP inputs are finalized and the model is used to evaluate the WIPs or milestones. DCR and EPA staffs have had ongoing discussion regarding the crediting of nutrient management for use as a "placeholder" BMP as a fix to this recognized deficiency in the model. In addition, we remain concerned about the restrictions on the use of the interim BMP for planning scenarios only. It is impossible for the Commonwealth to develop a plan to meet pollution goals though 2025 if the plan is developed under one set of efficiencies and evaluated under another. Because there is an expert panel working on solutions to this model defect, we are awaiting their results prior to finalizing the input deck for the milestones and the WIP.

2. Crediting of the benefits of Virginia's actions to eliminate phosphorus in retail lawn fertilizers. While the requirements of the law have not fully come into effect, major fertilizer manufacturers have begun to implement its provisions and we expect that the Bay is already experiencing positive effects from this significant legislation. We would like to engage in a discussion about how to appropriately credit this progress in the milestones and the Phase 2 input decks.

As we did in our Phase I plan, we must reiterate Virginia's concerns about cost, and compressed timing in the development of this plan. This rush to completion is cause for concern in local governments and the private sector and does not reflect the actual time it takes to develop and implement strategies. We also restate our significant concerns with the near absolute reliance on management by computer model. While the Bay model has advanced over the years, it continues to demonstrate flaws that call its output into question.

We are especially concerned that the level of precision expected is far beyond what the model is capable of producing. Virginians have already invested billions of dollars in Chesapeake Bay water quality improvement to date. It remains our position that the success of the Bay restoration effort depends upon the provision of fair and sufficient federal funding and participation by federal facilities in this effort.

Based on all these issues, as we did with our Phase I WIP, we reserve the right to adjust this plan based on new information and changing economic, fiscal or scientific circumstances. As Virginians, we are committed to improving the health of the Chesapeake Bay for future generations to cherish. We believe a clean Bay is good for the economic well being of the Commonwealth. The actions we have taken to date, and will continue into the future, demonstrates our commitment to on-the-ground water quality improvement. We will continue to work with stakeholders and with the public to ensure that our plan improves water quality in a manner that is sensible, fair and cost-effective. It is our sincerest hope that EPA will provide the tools necessary to accurately assess our plans and provide reliable guidance to our federal and state partners on the best practices that will meet our shared restoration goals.

Sincerely,

Douglas W. Domenech
Secretary of Natural Resources

Commonwealth of Virginia

Chesapeake Bay TMDL Phase II Watershed Implementation Plan

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EXECUTIVE SUMMARY

This Phase II Watershed Implementation Plan (WIP) has been developed by the Commonwealth of Virginia as part of the Chesapeake Bay Total Maximum Daily Load (TMDL) effort. As communicated by the Environmental Protection Agency (EPA) in formal guidance released in March of 2011, the purpose of the Phase II WIP is to:

- Divide the Bay TMDL allocations into local area targets.
- Work with local partners to help them to better understand their expected contribution to and responsibility for meeting the TMDL allocations.
- Describe how partners will help to reduce loads delivered to the Bay.
- Identify those resources, authorities, and other forms of assistance needed to implement actions that achieve TMDL allocations.
- Provide additional demonstration of reasonable assurance.
- Identify local, state and federal partners who will assist with achieving nutrient and sediment reductions.
- Describe how the state is working with its key partners.
- Identify state strategies to help facilitate implementation of local strategies.
- Develop clear quantifiable goals.
- Define systems for tracking, verifying and reporting progress.
- Involve federal agencies.

The Commonwealth has met these Phase II WIP objectives identified by EPA by undertaking the following:

1. Virginia Department of Conservation and Recreation (DCR) staff subdivided the TMDL allocations from a segment shed to a local government level and communicated the resulting local area targets to localities through meetings that were facilitated by regional Planning District Commissions (PDCs) during the spring and summer of 2011.
2. During PDC meetings with local government elected officials and staff, Virginia DCR staff explained how the model represented local land use, Best Management Practice (BMP) implementation levels and loadings from each of the land uses which resulted in these local decision makers gaining a greater understanding of pollutant loadings from the land uses within their jurisdictions. In communicating its desired deliverables to localities, the Commonwealth encouraged local governments to be active partners in improving the TMDL and WIP by updating modeled land use with more accurate local information, updating local BMP implementation progress and, most importantly, providing local BMP scenarios that met local goals and objectives.
3. The Commonwealth also asked localities to identify resource needs and strategies to advance the identified BMP scenarios.

As is evident by the local strategy tables included with this document (Appendix B-F), the Commonwealth of Virginia's local engagement initiative succeeded in working with our local partners to help them better understand their contribution to, and responsibility for, meeting the

TMDL allocations. These strategy tables also clearly articulate ways localities can reduce pollutant loadings in their communities. The state received submittals from 95 percent of localities within Virginia's Bay watershed and has tabulated close to 500 strategies that have been aggregated. Both the high response rate and the number of meaningful strategies submitted by local governments is a clear indication of an effective outreach strategy and that Virginia localities understand their contribution to and responsibility for addressing the TMDL. However, the timeline provided by EPA for completion of the Phase II WIP did not allow for sufficient vetting, participation from the public, endorsement from local stakeholders, and approval by elected officials of strategies submitted by the localities.

The document describes in detail the local engagement process that has been used to date, how the same successful model will be used going forward and supplements the strategies and commitments included in Virginia's Phase I WIP approved by EPA on December 29, 2010. Specific changes to the Phase I WIP are clearly indicated in this document.

Additionally, the Commonwealth submitted final milestones for 2012-2013 to EPA on January 6, 2012. These represent the first set of two-year milestone commitments associated with the Bay TMDL. They provide additional detail on anticipated strategies and implementation. Virginia is committed to working within the accountability framework for the Bay TMDL established by EPA, including adaptive management and the development of future milestones.

Since the submittal of the Phase I WIP, the Commonwealth has implemented several important initiatives that will provide significant progress in meeting nutrient reduction goals. These initiatives will serve to advance a significant number of the identified local strategies and provides additional assurance that the actions proposed in Virginia's WIP can be achieved.

Nutrient Credit Expansion

In order to help meet the challenging pollution reduction requirements imposed by the Bay TMDL, the Phase 1 WIP recommended the expansion of the nutrient credit exchange program as a tool to allow for greater flexibility in the implementation of necessary nutrient reduction practices. The exchange will also allow for decisions regarding the timing and location of implementation activities. An expanded program also allows local decision-makers to consider nutrient and sediment credit-generating potential as they face development, land use, and capital planning challenges.

In the fall of 2011, the Commonwealth drafted a framework for an expanded nutrient credit exchange program based on input from a broad-based stakeholder group. This effort resulted in comprehensive legislation that establishes a process for certifying and registering nutrient credits. It authorizes state agencies to establish clear regulatory standards for credit certification, establishment of baseline levels, and other factors for the efficient operation of nutrient credit markets in Virginia. This legislation has passed the General Assembly with broad support.

Agricultural Resource Management Plans

In the 2011 the General Assembly passed legislation requiring the promulgation of regulations for the development and implementation of agricultural Resource Management Plans (RMPs). The regulations have been drafted based on the input of a Regulatory Advisory Panel (RAP) established for this purpose, and were presented to the Virginia Soil and Water Conservation Board on March 29, 2012. Final regulations are expected to be completed in late 2012 and

implemented in early 2013. The RMP regulations set forth specific criteria for the implementation of a suite of agricultural BMPs and will serve to promote greater and more consistent use of voluntary agricultural practices across the state. The RMP regulations, though voluntary, provide an incentive to farmers who utilize agricultural BMPs in that they will receive a "safe harbor" from future mandatory requirements related to the Chesapeake Bay TMDL. They may also be used as a baseline for participation in the expanded nutrient credit exchange program. By incentivizing such practices, the RMP program can serve as a mechanism for localities to implement their agricultural strategies and BMPs. DCR will continue to work through the RAP and Soil and Water Conservation Districts (SWCDs) to appropriately incentivize the program. For example, the targeted use of agricultural cost-share dollars for RMPs will be evaluated.

Revised Stormwater Management Regulations

Revised comprehensive stormwater management regulations were adopted and became effective on September 13, 2011, with an implementation date of July 1, 2014. Virginia DCR has initiated an extensive outreach effort that began in November 2011 to communicate the benefits of localities adopting the provisions of these regulations, the specific criteria of the revised regulations, and the tools and assistance the state will provide to local programs.

DCR has also initiated a "Stormwater Regulation Roll-Out" process that will include the development of a comprehensive, multi-phased education and training program for local government staff and private sector engineers. It will also include developing a tool box for local governments to use in the establishment of their local stormwater programs. This tool box will include a model ordinance, checklists of minimum local program provisions and template plan review checklists, among other items. In addition, the agency is identifying a number of funding sources to assist with local government program development costs.

DCR has convened a Stormwater Local Government Advisory Committee (SLGAC) which held its first meeting March 29, 2012. The SLGAC will assist DCR in the evaluation and improvement of the tool box, provide feedback on local government needs and better inform DCR outreach efforts including regional meetings through PDCs and SWCDs as well as individual locality meetings.

Implementation of these regulations will result in stormwater management criteria being implemented by local governments across the state, thereby significantly increasing the amount of post construction stormwater treatment provided for new development and re-development.

The local implementation of the stormwater regulations and Municipal Separate Storm Sewer System (MS4) permitting are the key vehicles that will be used by the localities to address many of the urban sector strategies they have identified as part of the Phase II process. Section 6 of this document contains a review of the existing funding mechanisms and enabling authorities that exist to help localities ensure implementation of urban strategies and practices.

Stormwater Program Improvements and MS4 Permitting

In September 2011, EPA conducted a review of Virginia's urban stormwater programs. At the same time, the programs' organizational management was undergoing an internal restructuring. EPA's draft assessment of Virginia's urban stormwater programs as presented in December 2011 did not include changes in program management nor progress resulting from the restructuring.

After discussion with EPA, Virginia submitted comments on the draft assessment in December 2011 and currently awaits a final assessment. EPA provided a draft final assessment in late March 2012. As a result of ongoing discussions and upon receipt of a final assessment from EPA, Virginia expects to work with EPA on a Memorandum of Understanding (MOU) regarding the current status and future expectations of Virginia's urban stormwater programs. The expected MOU may include:

- A strategy and schedule for the development of proposed permits for all eleven administratively continued Phase I MS4s. Significant progress toward the issuance will be made in 2012.
- A process and full schedule for revising the Phase II MS4 general permit. The Notice of Intended Regulatory Action has been issued; the initial 30-day public comment period began March 26, 2012.
- A schedule for development of a compliance management strategy for the MS4 program. This schedule is currently being developed through conversations with EPA and DCR.
- A compliance management strategy for the stormwater construction program. This strategy is also under development.

Continuing improvements and progress in Virginia's Stormwater Management Programs along with the commitments embodied in the MOU and in this document sufficiently address the improvements EPA requested in their review of Virginia's Draft Phase II WIP.

Urban Nutrient Management

During the 2011 Virginia General Assembly session House Bill (HB) 1831 was passed. This legislation advances many of the strategies identified in the Phase I WIP to reduce the nutrients used in the urban setting. Among others, the legislation includes provisions that:

- Prohibits the sale, distribution and use of general lawn maintenance fertilizer containing phosphorus.
- Prohibits the sale of any deicing agent containing urea, nitrogen, or phosphorus intended for application on parking lots, roadways, and sidewalks, or other paved surfaces.
- Requires establishment of reporting requirements for contractor-applicators and licensees who apply lawn fertilizer to more than 100 acres of nonagricultural lands annually.
- Requires localities and golf courses to implement nutrient management plans on areas where they use fertilizer.

Phase II Local Strategies

Local strategies submitted as a result of the Commonwealth's extensive local engagement process have been aggregated at the state scale and organized within tables in Appendix B through F by source sectors – agriculture, urban/suburban, on-site wastewater, forest lands, and resource extraction. Local strategies were not submitted for the wastewater source sector as reductions for that sector are incorporated in the Watershed General Permit issued by the Virginia Department of Environmental Quality. The tables in each source sector appendix are further organized by the type of strategy – implementation, capacity building, and new BMP.

The source sector discussions contained in sections 5 though 9 contain brief summaries of the local strategies for that sector, how the state will assist the localities to advance these strategies, contingencies should the reduction targets not be met and procedures for tracking and reporting local partners' implementation actions.

The Commonwealth is extremely encouraged by the quantity of local strategies submitted in support of the WIP. We recognize that they represent not an end point but rather the beginning of a multi-year process to advance the local strategies in partnership with EPA and the localities. The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth. Rather, they are a menu of potential local actions that might be considered to address the Chesapeake Bay TMDL.

Ongoing Efforts

Moving forward the Commonwealth will continue its work to assist stakeholders with planning, capacity building, implementation, tracking/reporting and innovation activities. These next steps include:

- Refinement and development of new local strategies.
- Targeting implementation to reduce local water quality impairments and the Bay.
- Development of tracking systems to adequately track and report new BMPs for all sectors.
- Provide technical assistance, tools, and guidance to advance local strategies.
- Provide input into future milestone planning efforts.
- Identification of funding opportunities.

Based on feedback received from the Stakeholder Advisory Group (SAG) and some of the state's partner localities, Section 11 of this document incorporates a greater amount of detail regarding the next steps for the engagement of and assistance to localities.

SECTION 1. INTRODUCTION

The Environmental Protection Agency (EPA) established the requirements for state Watershed Implementation Plans (WIP) as part of a larger Chesapeake Bay Total Maximum Daily Load (TMDL) accountability framework. Virginia's Phase I WIP was approved by EPA on December 29, 2010. Additionally, as part of the accountability framework, the Commonwealth submitted milestones for 2012-2013 to EPA on January 6, 2012. The Phase II WIPs are an opportunity to refine the Phase I WIPs in collaboration with key local partners. In guidance issued March 30, 2011, EPA identified the purposes of the Phase II WIPs as:

- Facilitate implementation
    - Divide the Bay TMDL allocations into local area targets to help partners better understand their contributions to meet the TMDL allocations.
    - Describe how partners will assist in reducing loads delivered to the Bay.
    - Identify those resources, authorities, and other forms of assistance needed to implement actions that achieve TMDL allocations.
- Propose refinements as necessary to the Bay TMDL allocations
- Provide an additional demonstration of reasonable assurance that Bay TMDL allocations will be achieved and maintained and the means by which any new or increased pollutant loadings will be offset.

In order to fulfill this purpose, EPA has communicated expectations that Phase II WIPs should clearly identify:

- Key local, state, and federal partners who will be involved in reducing nitrogen, phosphorus, and sediment loads to meet Bay TMDL allocations.
- How the state is working with its key partners to:
    - Raise awareness of the level of effort that is expected to meet Bay TMDL allocations.
    - Define local partners' roles in implementing WIP strategies.
    - Document the process by which local partners' contributed to the development and will contribute to the implementation of WIP.
- State strategies to help facilitate implementation by local partners
    - How and when strategies will be implemented to fill any capacity gaps.
    - Strategies could include but are not limited to regulations, permits, technical assistance, and grant programs with specific provisions for local partners to reduce nitrogen, phosphorus and sediment loads.
- Clear, quantitative goals such as local area nitrogen, phosphorus, and sediment targets, best management practice (BMP) implementation levels and/or programmatic milestones.
- How progress by local partners will be tracked, verified and reported for progress runs and the state's two-year milestones
- How Virginia is working with federal agencies to meet Bay TMDL allocations.

In addition to these requirements, Virginia has identified the following objectives for the Phase II WIP:

- Focus on strategies that reduce and prevent nutrient and sediment losses to improve the quality of local waters and the Chesapeake Bay.
- Convey the relationship between Chesapeake Bay restoration and protection of local waters.
- Establish targets at the local government level as a tool for use by the local governments, Planning District Commissions (PDC), and Soil and Water Conservation Districts (SWCD) to quantify required conservation actions and account for progress toward achieving the targets and local water quality improvements.
- Utilize local targets to facilitate engagement and partnership with local governments, PDCs, SWCDs, and other stakeholders in order to advance a better understanding of the local contribution to and responsibility for reducing pollutant loads.
- Utilize the Phase II planning process as a mechanism to build upon existing practices and controls and determine the extent to which these existing practices can be enhanced to meet targets. The guiding principle reflected in this objective is building upon and enhancing existing regulations and programs rather than creating new ones.
- Use the Phase II process to form a foundation upon which future milestones can be developed and progress tracked.

In their March 2011 guidance, EPA also established the following schedule for development of the Phase II WIP:

- April 30, 2011 - EPA distribution of the Guide for Federal Lands and Facilities' Role in Chesapeake Bay Jurisdictions' Phase II Watershed Implementation Plans.
- May 9, 2011 - EPA distribution of the 2-Year Milestone Guide to the jurisdictions and federal agencies.
- June 30, 2011 - EPA completes two agreed-upon changes to Watershed Model, provides results of key scenarios run through the updated Watershed Model, and proposes nitrogen, phosphorus and sediment allocations for the 19 state-basins.
- July 15, 2011 - Based on jurisdictional review, EPA finalizes nitrogen, phosphorus and sediment allocations for the 19 state-basins.
- November 1, 2011 - Preliminary 2012-2013 jurisdiction milestone commitments submitted to EPA for scenario analysis.
- December 1, 2011 - Draft Phase II WIPs submitted to EPA. Changed to December 15, 2011 by October 5, 2011 correspondence.
- January 3, 2012 - 2012-2013 jurisdiction milestone commitments submitted to EPA. Changed to January 6, 2012 by 2-Year Milestone Guide.
- January 31, 2012 - Formal EPA comments on draft Phase II WIPs.
- March 30, 2012 - Final Phase II WIPs submitted to EPA.

The Commonwealth submitted preliminary milestones for 2012-2013 to EPA on November 4, 2011 and final programmatic milestones on January 6, 2012. These represent the first set of two-year milestone commitments associated with the Bay TMDL. Virginia submitted a draft Phase II WIP document on December 15, 2011 that focused on describing the process used for Phase II planning. In an effort to maximize the time available for localities to develop the requested information, the draft document did not contain the results of our local engagement efforts. The time frame provided by EPA to convey the model information related to the revised EPA planning targets to the localities was far too short. It provided little time for the PDCs and localities to develop strategies, discuss them with local stakeholders, and have them endorsed by their elected and appointed officials. EPA provided feedback on their evaluation of Virginia's Draft Phase II WIP on February 15, 2012.

Development of this Phase II WIP confirms Virginia's commitment to the conservation and restoration of the Chesapeake Bay and Virginia's rivers. This Phase II WIP document builds on the framework of the Phase I and Draft Phase II WIPs by incorporating federal and local strategies and resource needs to reduce loads delivered to the Bay.

This document supplements the strategies offered in Virginia's Phase I WIP that was approved by EPA in December, 2010. Unless there are specific changes to the elements of the Phase I WIP, the strategies and commitments in the November 29, 2010 document remain in force.

1.1 Stakeholder Advisory Group

The Virginia Secretary of Natural Resources established the Stakeholder Advisory Group (SAG) as a forum for stakeholder input during the development of the Phase II WIP. The SAG includes representatives from PDCs, local governments, SWCDs, environmental organizations, home builders associations, commercial real estate, agricultural interests, and consultants. Specific issues to be discussed by the committee include but are not limited to:

- Provide recommendations on strategies to successfully engage localities, PDCs, SWCDs and other local and regional entities in the Phase II WIP process.
- Provide comments and recommendations on issues raised by localities, PDCs, SWCDs and other local and regional entities as they work toward identifying pollution reduction practices and strategies to be undertaken at the local level.
- Identify potential resources, including funding and staffing opportunities, to assist local governments and other local entities in implementing identified practices.
- Provide comments to the Secretary of Natural Resources on the draft Phase II WIP document.

The SAG met four times in 2011-2012 to fulfill their charge (April 26, 2011, August 16, 2011, November 7, 2011 and March 15, 2012). Detailed information about these meetings is available online at http://www.dcr.virginia.gov/vabaytmdl/baytmdlsag2.shtml.

1.2 Websites and Technology Based Outreach

For Phase II the state's TMDL website is housed on the Virginia Department of Conservation and Recreation's (DCR) site. It can be found at

http://www.dcr.virginia.gov/vabaytmdl/index.shtml. The site also has links to the EPA Bay TMDL site at http://www.epa.gov/chesapeakebaytmdl/.

A Virginia Bay TMDL listserv created during the development of the Phase I WIP to help inform stakeholders of nonpoint source related elements of the TMDL and WIP process was again used in Phase II. Members of the listserv include local elected officials, local government staff, SWCD directors, staff, and officers from municipal and county professional groups, agricultural producer groups, professional associations in the development and land-use communities, private consultants, large public landowners in the watershed and more. The listserv has grown to more than 800 addresses.

A Virginia Phase II WIP forum was established on the ChesapeakeBay.net website to further enhance communication and outreach. The forum was developed, following feedback received during our local engagement efforts, as a digital venue for discussion of pertinent issues related to the development of the Phase II WIP.

1.3 Presentations to Interest Groups

During the development of the Phase II WIP, a number of interest groups requested presentations and opportunities to provide input to the agencies. Given the importance of localities and PDCs in the Phase II planning process, the state has worked hard to reach out to those statewide organizations that represent these entities. Since March 2011, state representatives from the Secretary of Natural Resources Office and DCR senior staff, including the director, gave presentations on the Phase II WIP and the overall Chesapeake Bay TMDL to the following groups:

- Virginia Association of Planning District Commissions – Annual Meeting –March 2011.
- Virginia Chapter of the American Society of Civil Engineers – March 2011.
- Environment Virginia (an annual environmental summit, attended by local governments, conservation groups, agricultural groups, industry, military, and consultants held at the Virginia Military Institute) – April 2011.
- Virginia Association of Counties – Special Workshop on the Chesapeake Bay TMDL Phase II – May 2011.
- Virginia Municipal Stormwater Association - July 2011.
- Rappahannock River Basin Commission – September 2011.
- Virginia Association of Counties - Annual Meeting – November 2011.
- Virginia Association of Soil and Water Conservation Districts – December 2011.
- Virginia Crop Production Association – January 2012.
- Middle James Roundtable 2012 Annual Meeting – March 2012.
- Virginia Natural Resource Leadership Institute – March 2012.

1.4 Nutrient Credit Expansion

Trading and Offsets Virginia's Phase I Watershed Implementation Plan

Section 1.7 of Virginia's Phase I WIP said "[i]n order to help meet the challenging pollution reduction requirements imposed by the Bay TMDL, this Phase I 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."

Nutrient Credit Trading: Actions Taken since the Approval of Phase I WIP

In addition to the recommendation in the December 2010 Phase I WIP, the 2011Virginia General Assembly adopted Senate Joint Resolution (SJR) 334 that directed the Secretary of Natural Resources to undertake a study of the possible nutrient credit program expansion and report to the 2012 session of the General Assembly.

As called for in SJR 334, the Secretary assembled a broad-based committee of stakeholders and technical experts to examine the issues contained in the Phase I WIP and make recommendations for a possible expansion. Department of Environmental Quality (DEQ) staff was asked by the Secretary of Natural Resources to lead the study with the assistance of other state agencies. The committee first met in April of 2011. Subsequent meetings were held in June, August, October, and November of 2011. A full record of the agendas, presentations and draft documents of the committee is housed on DEQ's website at:
http://www.deq.virginia.gov/vpdes/NutCrdExStudy.html

As a result, in January 2012, Secretary of Natural Resources Douglas W. Domenech submitted a report to the Governor and the General Assembly (published as Senate Document 6 see: http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/SD62012/$file/SD6.pdf) that proposed an expansion of the use of nutrient credits in Virginia and made recommendations to the Governor and the General Assembly on a framework for the expansion. The Secretary's report recommended a process by which nutrient credits should be certified and recommended agency regulatory action necessary to implement the proposed framework.

The Secretary's report represented the consensus of the committee on the key issues related to the proposed expansion. It did not represent unanimous agreement on every detail. Additional refinement to the expansion included in the legislation adopted by the General Assembly will be proposed through the regulatory process.

Summary of the Expansion Passed by the General Assembly

The provisions of the 2012 legislation build on the programs currently in place in Virginia. Since the passage of House Bill 2862 in the 2005 session of the General Assembly, significant wastewater facilities have been authorized to engage in credit exchange within each of Virginia's major Chesapeake Bay river basins to achieve compliance with mandated nutrient loading caps prescribed by the State Water Control Board. Nutrient credit trades between significant point source facilities (municipal wastewater treatment plants and industrial facilities) are governed by the General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820-10) that is authorized by §62.1 – 44.19:12 – 19 of the

Code of Virginia. Complete information regarding the permit can be found at http://www.deq.virginia.gov/vpdes/nutrienttrade.html

The current trading program is based on allocations of nitrogen and phosphorus established under the permit. It allows point source to point source trading to comply with waste load allocations and allows the use of nonpoint source credits only to offset new or expanding point source facilities. The 2005 legislation also authorized the establishment of the Nutrient Credit Exchange Association, a private non-stock corporation that facilitates trades among its members.

Section 10.1 – 603.8:1 of the Code of Virginia authorizes the use of nonpoint source nutrient credits to meet a portion of the post-construction phosphorus loading requirement of Virginia's stormwater management program in the Chesapeake Bay watershed. Under current law, perpetual stormwater offsets may be used to meet a portion of the phosphorus loading limitations prescribed under Virginia's stormwater management program.

The legislation proposes the process for certifying and registering nutrient credits by authorizing DCR, working with DEQ and other state agencies, to establish clear regulatory standards for credit certification, establishment of baseline levels, and other factors for the efficient operation of nutrient credit markets in Virginia.

Based on the bills adopted by the General Assembly, Municipal Separate Storm Sewer System (MS4) permittees, confined animal feeding operators, and facilities registered under the Industrial Stormwater General Permit issued pursuant to the State Water Control Law may acquire and make use of nutrient credits, in accordance with specified restrictions.

Full text of the legislation passed by the General Assembly can be found at:
http://leg1.state.va.us/cgi-bin/legp504.exe?ses=121&typ=bil&val=sb77 or
http://leg1.state.va.us/cgi-bin/legp504.exe?ses=121&typ=bil&val=hb176

Next Steps

DCR will begin the regulatory process as established by the General Assembly.

1.5 James River Study

Section 1.6 of Virginia's Phase I WIP proposed a plan to review the numerical chlorophyll "a" water quality criteria that are only applicable to the James River. As proposed in the Phase I WIP, in 2011, Virginia began a comprehensive scientific study for the tidal James River in 2011 that will be overseen by the Department of Environmental Quality.

A Scientific Advisory Panel has been formed to assist the Commonwealth in determining the scope, design, and approach of the study to be conducted over the next 3-5 years. In 2011, the panel met and drafted a Workplan entitled *Data and Modeling Needs for Assessing Numeric Chl-a Criteria of the James River Estuary* (http://www.deq.virginia.gov/wqs/rule.html).

Based on the recommendations of the advisory panel, monitoring and modeling contracts will be awarded in 2012 to address key components of the workplan over the next three years. During 2012-2013, the monitoring programs will focus on characterizing the occurrence of algal blooms and to establish quantitative links between algal blooms and designated uses. The modeling work will focus on building a water quality/phytoplankton model of the James River estuary. While

the initial phase includes data gathering and analysis (2012-2013), this information will be used to better predict and assess attainability of the chlorophyll-a criteria under various management scenarios.

DEQ has also commenced actions under the Virginia Administrative Process Act should any changes to existing standards be warranted based on the outcome of the scientific study. Information on the regulatory action can be found at: http://townhall.virginia.gov/L/ViewAction.cfm?actionid=3522

SECTION 2. PHASE II LOCAL ENGAGEMENT

2.1 Introduction

Within Virginia's Chesapeake Bay watershed, local governments have authority to manage the use and development of land and administer many of the Commonwealth's environmental regulations including the Erosion and Sediment Control Law, the Chesapeake Bay Preservation Act (Bay Act) and other requirements. These jurisdictions represent the greatest opportunity to implement strategies to meet the WIP. Additionally, many of these localities are also permittees for federal requirements such as the MS4 permits and wastewater discharge. Although Virginia localities, through their administration of land use and water quality requirements, will play a significant role in meeting the Chesapeake Bay TMDL, the state has chosen to engage the localities on the Phase II process through the sixteen PDCs in the Chesapeake Bay watershed. The PDCs were established by § 15.2 of the Code of Virginia "to encourage and facilitate local government cooperation and state-local cooperation in addressing, on a regional basis, problems of greater than local significance. The cooperation resulting from this chapter is intended to facilitate the recognition and analysis of regional opportunities and take account of regional influences in planning and implementing public policies and services." Further, the PDCs are comprised of the individual localities within the geographic area covered by the PDC and have a long tradition in Virginia of promoting and advancing solutions for managing complex and regional problems including transportation planning. Using this vehicle for engagement, Virginia has been able to communicate to the local governments, PDCs, SWCDs, and local representatives of federal facilities their contribution to and responsibility for managing the Chesapeake Bay TMDL.

2.2 Key Local, State and Federal Partners

The key partners in the implementation of pollution reduction strategies to meet the Chesapeake Bay TMDL include local governments, PDCs, SWCDs and federal facilities. The localities are authorized by the Code of Virginia to develop local ordinances and programs to manage existing and future land uses and activities to protect and improve the quality of their communities. The SWCDs are authorized by state law to provide agricultural BMP cost-share assistance to farmers, assist local governments with the administration of the state Erosion and Sediment Control Law, provide assistance to farmers in conservation planning consistent with the federal Farm Bill and coordinate and deliver services that support implementation of county ordinances including agricultural provisions of the Bay Act and assisting with the implementation of Virginia's Agricultural Stewardship Act.

Federal facilities account for more than 1.7 million acres of land in Virginia's Chesapeake Bay Watershed. While the majority of these federal holdings are national forests, natural areas, refuges, wilderness areas and parks, they also include many highly developed military bases and federal buildings. All of these federal facilities have an important role in managing water quality and improving the Chesapeake Bay.

2.3 State Strategy for Local Engagement

In February 2011, Virginia convened a Chesapeake Bay Phase II WIP project team made up of various key program staff from DCR and senior staff from DEQ, Department of Forestry, Department of Transportation, Department of Agriculture and Consumer Services and Department of Health. This team developed a local engagement process that incorporated the use of Virginia's PDCs, established local engagement teams assigned to each of the PDCs and involved a three-staged effort to engage localities, the SWCDs, federal partners and other stakeholders in the Phase II development process.

The first stage involved meetings between the Assistant Secretary of Natural Resources for Chesapeake Bay Restoration and the PDCs in the Bay watershed to provide a high level overview of the Chesapeake Bay TMDL and the Watershed Implementation Planning process. These meetings occurred from March through May 2011 and were attended by local elected and appointed officials who are members of the PDC. These meetings began the process of informing local elected officials of the Chesapeake Bay TMDL, the components of the Phase I WIP and the potential role of local stakeholders during the Phase II process. During these initial meetings, the PDCs and their member localities were asked if they were willing to participate in the Phase II planning process.

During the second stage of the engagement process, DCR local engagement teams conducted follow-up meetings with the PDCs. During these meetings, staff provided more detail on the Phase II WIP planning process and began working with the PDCs to determine the extent to which they were willing to participate in this process. These meeting took place from April through June 2011.

The third step in the process included data delivery meetings with the PDCs and local governments. At these meetings DCR staff provided detailed Chesapeake Bay Watershed Model information (v5.3.0) for each of the local governments within the PDC area. The model information included local loads for nitrogen, phosphorous and sediment, land use/land cover information for the localities and BMPs for the 2009 progress run and the 2025 Phase I WIP scenario. During this process DCR staff provided detailed explanations of the model information so that staff from the PDCs and the localities fully understood the pollutant loadings, land uses and existing BMPs currently represented in the model for their jurisdictions.

Another key element of the data delivery meetings was to convey to the localities and PDCs the information the state needed from them in support of the Phase II WIP document. The following list is the information the state requested that the localities provide:

- A review of current local BMP inventory as compared to the EPA model BMP information – this information will be used to update implementation progress data in the Bay model.
- An evaluation of the land use/land cover information included in the EPA model and provision of more accurate land cover information – this will be of tremendous assistance

in ensuring that Bay model revisions made in the future will more accurately reflect local land use information.

- A review of the 2017 and 2025 BMP scenarios provided and development of preferred local scenarios that meet the reduction goals – identified local BMP scenarios will be aggregated and incorporated into the Phase II WIP.
- Strategies to implement the preferred BMP scenarios – strategies will be aggregated and used in development of Virginia's Phase II WIP.
- An identification of resources needed to implement the strategies and BMP scenarios – this information will be used in drafting Virginia's Phase II WIP and developing of cost estimates for WIP implementation.

The data delivery meetings occurred from mid-May through the end of June 2011. As a follow-up to the meetings with PDCs and local governments, and at the request of PDC and local government staff, DCR sent letters to the local governments in Virginia's Bay watershed reiterating the information that was needed from the local governments to assist in the development of the Phase II WIP.

As part of this outreach process, local engagement team members continued to meet with the PDCs and local government to respond to questions and provide assistance as they compiled the information the state requested related to the Phase II WIP.

To augment the engagement process identified above, the state worked with the Choose Clean Water Coalition, a consortium of conservation organizations, to conduct a series of workshops across the Bay watershed. These workshops took place from June through October 2011 and provided local governments and PDC staff specific technical assistance on how to analyze the Bay model information for their localities or PDC areas and update that information with more accurate local information on land use/land cover and local BMPs.

Another important series of meetings with local stakeholders came with EPA's release of revised model data and the development of the Virginia Assessment and Scenario Tool (VAST). This new tool was designed to help the Commonwealth, municipalities, federal agencies and other partners quickly and easily evaluate nutrient reduction strategies. These workshops provided an opportunity for gaining hands-on experience with VAST. The workshops included a presentation of the revised (v5.3.2) Watershed Model output, explanation of the changes to the requested deliverables resulting from the new model's anomalies, and demonstration of the VAST as a tool for developing and reporting the deliverables.

As a result of this engagement effort, PDCs, along with their partner local governments, now better understand the pollutant loadings from the various source sectors, the pollutant reductions needed in order to meet the Bay TMDL and the level of BMP implementation needed within their areas as identified by the Bay model. This information has been analyzed by PDCs and the localities in formulating their responses; updating land use/land cover, BMP information and identifying strategies to address the Bay TMDL.

2.4 State Support of Local Planning

2.4.1 Virginia Assessment and Scenario Tool

As described above, the state has provided significant technical assistance to PDCs and local governments as they update the Bay watershed model information and identify strategies to address the Bay TMDL. To facilitate this process, the state deployed the VAST on September 29, 2011 and has provided training on the use of this tool to PDCs, local governments, SWCDs, consultants and other stakeholders. The VAST tool provides the PDCs and/or local governments with a mechanism to submit updated land use/land cover and BMP information and to evaluate a variety of BMP scenarios to meet the WIP I levels of implementation.

2.4.2 Technical and Financial Assistance

In addition to the direct assistance from state staff, PDCs and local governments have been offered several sources of technical and financial assistance for the Phase II process. The state has offered technical assistance through Tetra Tech, a consulting firm on contract to EPA, and the Chesapeake Bay Program Circuit Rider, a program that supports localities with technical assistance. These options offer hands-on technical assistance in identifying and reviewing Bay model information at the local level, identifying preferred BMP scenarios to address the TMDL, as well as assistance with developing strategies to implement those scenarios. Several PDCs have used these technical resources. In addition to technical assistance programs, the state provided over $200,000 in financial assistance for Phase II planning to PDCs, local governments, SWCDs, and other stakeholders.

2.5 Federal Facilities Phase II Planning

Federal facilities are important partners in the Phase II planning process. Federal partners participated in many of the PDC meetings at which DCR staff presented the Chesapeake Bay Watershed Model information. Many have actively engaged with state and local staff on ways the federal facilities' actions toward meeting the TMDL goals could be coordinated with the strategies of the state, local governments, and PDCs.

EPA guidance for federal lands and facilities' role in the Phase II process (published April 29, 2011) states that "federal agencies with property in the watershed will provide leadership and will work with the Bay jurisdictions in the development of their Watershed Implementation Plans." In doing so, federal agencies are expected to work with the Bay jurisdictions to:

- Identify federal lands and facilities.
- Estimate nitrogen, phosphorus, and sediment loads from those federal lands and facilities.
- Identify potential pollutant reductions from point and nonpoint sources associated with federal lands and facilities by providing information on property boundaries, land cover, land-use and implementation of management practices.
- Commit to actions, programs, policies and resources necessary through 2017 and 2025 to reduce nitrogen, phosphorus and sediment pollutant loads associated with federal lands and facilities by specific dates.
- Provide information on those actions, programs, policies and resources that are or will be necessary to achieve target load reductions for federal lands and facilities determined by

the jurisdictions in their Phase II WIPs subsequent to collaboration with the federal agencies.

To advance this effort DCR staff convened a meeting with representatives of the federal facilities on December 19, 2011 to discuss their overall participation in the development of the final Phase II WIP, ensure all federal facility representatives understand EPA's expectations for their participation in the process and explain the state's expectation that each facility or agency representative provide data to the Commonwealth and coordinate with the locality in which the facility is located. At this meeting, staff discussed specific actions the federal partners should undertake to meet with localities and to begin compiling the information they are to provide the state for incorporation into Section 10 of this document.

A key strategy for working with federal lands and facilities is to encourage all the Virginia facility representatives to engage with the local governments in which they are located and to provide information relating pollutant loadings, levels of BMP implementation and land use information for their facility. They were asked to work with their partner localities and PDCs as those entities developed their BMP scenarios. The desired result was for the federal facilities and their local partners to understand the extent to which each entity can contribute to the total level of BMP implementation.

The ability of the VAST to inform stakeholders of the contribution by federal facilities and lands to local pollutant loadings and levels of BMP implementation is extremely limited. The most recent version of the Bay model shows federal facilities in the aggregate and does not show specific facilities. Furthermore, the land use associated with the federal holdings is represented in the model as proportional to the land use in the surrounding county. These limitations in the model have significantly impacted the ability for federal facilities to understand their share of the pollution reductions required to meet the TMDL. The model should be updated at the earliest opportunity to correct the federal land use information and to further segment federal holdings by facility or agency. Associated refinement to VAST should follow. This would allow federal facilities the opportunity to use the VAST as an implementation planning tool in the same way localities can now.

2.6 Locality Data Submissions

DCR received data submissions from 95 percent of Bay watershed localities. Staff organized and reviewed locality responses to document receipt of information, evaluated the completeness of submissions, and, contacted locality staff for clarification of data, if needed. A summary of locality data submissions is included in Table 2.1. The "Responsive – No Data" categorization signifies that the respondent did not have available data to contribute or could not provide additional data in the timeframe available.

Table 2.1- Summary of Locality Data Submissions by Deliverable

Summary of Locality Data Submissions by Deliverable					
	LAND USE	**CURRENT PROGRESS**	**2025 SCENARIO**	**STRATEGIES**	**RESOURCES**
Responsive	94%	94%	93%	95%	95%
New Data Provided	54%	65%	40%	75%	75%
No New Data	40%	29%	53%	20%	20%
No Response	6%	6%	7%	5%	5%

SECTION 3. LOCAL TARGETS

This section describes the process for developing the local targets and implementation goals for localities in Virginia's Bay watershed. In accordance with EPA guidance for Phase II WIPs dated November 4, 2009 and March 30, 2011, Virginia divided the Bay TMDL allocations into local area targets. These local area targets are not finer scale waste load and load allocations in the Bay TMDL but, when added together, would equal the relevant state-basin TMDL allocation caps. The local targets are intended to help partners better understand their contributions to meet the WIP. When choosing the appropriate scale for local area targets Virginia followed the EPA guidance and considered:

- Scale that would facilitate engagement of local stakeholders.
- Scale at which programs or actions identified are delivered.
- Scale at which partners could be held accountable for meeting local targets.
- Scale at which the Chesapeake Bay models can track loads.

Given these considerations, it was determined that the scale of local targets in Virginia would be that of city and county boundaries.

3.1 Process for Developing Local Nonpoint Source Targets

In May 2011, using EPA model data, the state gave the localities in Virginia's Bay watershed goal loads and reduction goals for nitrogen, phosphorus and sediment. EPA's v5.3.0. watershed model edge-of-stream loads for Virginia's Phase I WIP were the basis for subdividing the Bay TMDL allocations into local goal loads. The 2009 Progress edge-of-stream loads were then compared to the local goal loads to determine the reduction goals. In addition to the goal loads and reduction goals, each locality was provided with detailed model data on land use and BMPs in their jurisdiction. While the data were provided with more details on the sources and watershed segments within the locality, the sum of all of the nonpoint source loads constituted the local goals. Combining all source sectors and segment sheds in a single goal is intended to give localities maximum flexibility in managing their pollution reductions. When data was provided to localities, they were informed that revisions to the Chesapeake Bay watershed model were pending and that these changes would result in some change to their local goals. EPA's Chesapeake Bay Program Office estimated the potential change in loads to be around five percent.

As EPA was completing the v5.3.2 model revisions in May 2011, analysis of the model's inputs and outputs revealed some serious deficiencies in the model's simulation of agricultural nutrient management as well as high levels of variability in loads when evaluated at the local scale. Virginia repeatedly voiced its concerns about the new model through the Bay Program partnership. These anomalies in the model caused significant changes in the local target loads, well in excess of the EPA's projected five percent change. The model anomalies also made the development of local load based targets, as required by EPA, highly suspect. At Virginia's urging, EPA hosted a modeling summit on September 16, 2011 to hear the states' concerns. Representatives from each of the bay watershed states and the District of Columbia attended along with EPA Region 3 and EPA's Bay Program Office. At that meeting, the Commonwealth presented its proposed path forward as follows:

- EPA must continue to work on fixing the model so it can be used with confidence in setting target loads at the local level.
    - Conduct a holistic review of how nutrient management is modeled and modify models as needed.
    - Re-calibrate the model as needed.
    - Run scenarios and provide sufficient time for review and verification that the nutrient management fix worked with no unintended consequences.
    - Changes cannot wait until 2017.
- Virginia will develop a Phase II WIP focused on local strategies to implement BMPs at levels consistent with the Phase I WIP.
    - Continue local engagement efforts, with focus on strategy development.
    - Refine BMPs and implementation levels. When the model is ready, develop local target loads.
    - Develop 2012-2013 Milestones as planned.
- Continue to expand implementation efforts.

Due to the unanticipated variability in local target loads, and the anomalies resulting from the revisions to the watershed model, EPA issued guidance clarification on October 5, 2011. The guidance suggested alternative approaches to developing local targets, as well as changing the scale at which EPA would expect inputs. These circumstances led to a modification in the state's approach for Phase II WIP planning. Instead of asking local governments to develop implementation scenarios to meet model-generated local target loads, the state shifted the focus to an implementation based target. These local implementation targets were derived from the Phase I WIP BMP levels applied at the local scale based on the watershed model. These BMP implementation targets were provided to local governments in a spreadsheet table and as a preloaded scenario that could be evaluated, copied and adjusted in the VAST.

EPA followed the October 5, 2011 letter with a second communication on October 17, 2011 that outlined near (0-6months), medium (6-18 months), and long (2017 and beyond) term actions to correct the technical issues identified at the September 16th meeting. The only action available to the state to resolve the model concerns in time to influence the Phase II WIP process was the development of interim BMPs for inclusion in the model.

Virginia has continued to work with EPA to develop a temporary (near term) and permanent (medium/long term) fix to the deficiencies in the model's simulation of agricultural nutrient management. EPA has agreed to have a panel of experts conduct a comprehensive review of the model's simulation of nutrient management to improve the next version of the model as well as to identify an appropriate midterm patch to carry us through to 2017. These solutions are expected in the fall of 2012. In the near-term, EPA has approved the use of an interim BMP for agricultural nutrient management that simplifies the model, using a reduction efficiency for the practice, but EPA will only allow the use of the interim efficiencies in developing the plan and not in evaluating the progress of the plan. EPA and Virginia still disagree on the appropriate efficiency values for the interim BMP, though negotiations on the topic are continuing. Upon final resolution of the efficiency values, Virginia will be able to finalize the Phase II WIP model input deck and develop load targets. However, the local scale problems with the model continue to make development of local load targets suspect.

3.2 Target Loads for Point Sources

The point source waste load allocations (WLAs) are contained in Appendix Q of the Chesapeake Bay TMDL. The WLAs appear in the reissued General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia [9 VAC 25 - 820] that became effective on January 1, 2012. Because the waste load allocations for wastewater dischargers are contained in the permit, no local targets were developed for the point source sector for this Phase II WIP.

3.3 Phase II WIP Planning Targets

The Phase II planning targets for Virginia were issued by EPA on August 1, 2011. These targets were derived from using the Phase I WIP BMPs applied in the new v5.3.2 model construct. Because of the changes in the model, the planning targets fall short of the previously established Bay wide TMDL loads needed for full attainment of water quality standards. This difference in loads will be accounted for through adaptive management and the 2017 development of Phase III WIPs. However, it is clear that the shortfall was influenced by the agricultural nutrient management anomalies identified in the model. The limitations in the model prevent the refinement of these planning targets into meaningful local load targets.

Table 3.1- Assigned Phase II WIP Planning Targets

Assigned Phase II WIP Planning Targets			
	Nitrogen (Million pounds per year)	**Phosphorus (Million pounds per year)**	**Sediment (Million pounds per year)**
Eastern Shore	1.41	0.15	15
Potomac	16.41	1.81	921
Rappahannock	5.92	0.93	1197
York	5.51	0.63	153
James	23.21	2.94	966
Virginia Total	52.46	6.46	3251

SECTION 4. WASTEWATER

4.1 Phase II Strategies

Strategies contained in the Phase I WIP related to stormwater remain in force with the following modifications.

4.1.1 Impacts to Phase I Strategies

The following are technical changes to the Phase I WIP.

1. The Phase I WIP contains several references to the waste load allocation for non-significant industrial discharges with coverage under a Car Wash, Concrete, Cooling Water, and Nonmetallic Mineral Mining VPDES General Permit. In all cases where there is reference to these non-significant sources, it also includes the Seafood General Permit and the Potable Water Treatment Plant General Permit. The references to these additional general permits were inadvertently omitted in the Phase I WIP. This change is clarifying in nature and does not significantly affect the overall assigned allocations to the various source sectors in the WIP or the TMDL waste load allocations.
2. The Phase I WIP recognizes that wastewater allocations for sediment loads will be set at technology levels since wastewater is an insignificant portion of the sediment load. As a further clarification, the individual and general VPDES permits will be considered consistent with the TMDL as long as the aggregated total suspended solids (TSS) loads for all individual and general permit facilities is less than the aggregate TSS wastewater load in the WIP.
3. The EPA Phase I WIP Guidance Appendix B calls for states to provide individual point source loads to the extent possible. In response to this request, DEQ submitted a comprehensive database to EPA on November 29, 2010. The database included a listing of hundreds of significant and non-significant permitted facilities. Following publication of the Chesapeake Bay TMDL, it was discovered that loads from about 80 non-significant facilities were not incorporated by EPA into the Chesapeake Bay watershed model. In addition, EPA reported discrepancies between locations of facilities in the watershed model and the locations provided by Virginia. To ensure these additional loads are captured in Phase 2 Plans, DEQ has been working with EPA contractor support to identify and correct these discrepancies. In addition, DEQ will be adding nearly two dozen new non-significant permitted facilities. The loads from these additional facilities will become part the appropriate Chesapeake Bay segment aggregate load.

4.1.2 Updated Approach for Permitting of Combined Sewer Systems

EPA approved the Phase I WIP that listed the WLAs for combined sewer system flows in Virginia as well as the basis for each facility's WLAs. The Chesapeake Bay TMDL acknowledged that EPA and DEQ needed to come to agreement on the permitting language of the Watershed General Permit related to combined sewer systems by the time EPA reviewed the Phase II WIP. During the past year, EPA and DEQ resolved the approach for addressing combined sewer systems in Virginia. DEQ reissued the Watershed General Permit with EPA Region III concurrence and both agencies agreed on the following language for permitting

combined sewer systems. The underlined text below reflects updated information that is consistent with the agreed upon approach.

Waste load allocations were specified in the Chesapeake Bay TMDL for significant facilities as individual annual loads, with the exception of aggregate WLAs assigned to the wastewater dischargers in the James River. For each community with combined sewers, these loads included loads from dry weather flows (DWFs) and from combined sewer captured (CS-C) flows that are treated and discharged at the publicly owned treatment works. Separate WLAs were assigned to the combined sewer overflows (CSOs).

The Virginia Water Quality Management Plan (WQMP) Regulation does not discuss allocations for the direct CSOs or CS-C flows. The regulation does recognize the concept of CS-C flows for Richmond and Lynchburg by indicating that the WLAs are based upon the dry weather flow capacity at each facility and that technology based requirements apply during wet weather flow events. For Richmond and Lynchburg the CS-C loads are to be incorporated in the individual VPDES permits for those facilities. The loads associated with the DWFs will continue to be accounted for in the VA Watershed General Permit.

Because the WQMP Regulation does not recognize any wet weather flow provisions for the Alexandria Sanitation Authority, the watershed general permit will include the DWF WLA for Alexandria Sanitation Authority and the WLA will apply regardless of weather conditions. This is consistent with how the WLA was implemented in the first cycle of the watershed general permit. On February 15 2012, the Alexandria Sanitation Authority filed a petition for a rule making to modify the WQMP to add a wet weather flow provision for the Alexandria Sanitation Authority similar to the current WQMP wet weather flow provision for Richmond and Lynchburg. Upon modification of the WQMP to address wet weather flows at Alexandria, the watershed general permit registration list and the individual VPDES permit will be modified as appropriate.

Information used to develop the WLAs are used to establish effluent limitations and to develop permits consistent with the assumptions and requirements of the Chesapeake Bay TMDL WLAs [40 CFR 122.44(d)(1)(vii)(B)].

Both paragraphs below will be used to develop permits for Richmond and Lynchburg; upon modification of the WQMP for the Alexandria Sanitation Authority to address wet weather flows, the 2nd paragraph below will be used to develop a permit for Alexandria Sanitation Authority.

1. *Appendix X of the Chesapeake Bay TMDL allows for a staged implementation approach only within the James River in order to meet the aggregate WLAs since existing information suggests that these loads may not be achieved prior to 2018. Since this will be beyond the reissued permit term, monitoring & reporting only is required for the CS-C load in this permit renewal.*
2. *In order to comply with the TMDL WLAs, the loads from the DWF and CS-C flow will be converted into water quality-based performance standards expressed as annual average concentration based effluent limits for total nitrogen (TN), total phosphorus (TP), and TSS. These concentrations will be applied to the total flow from the waste water treatment plant (WWTP) and will be consistent with the EPA Chesapeake Bay model input data necessary to*

meet water quality standards for the critical time period and critical flow condition evaluated by the TMDL. These limits will be incorporated into the next individual permit renewal in order to comply with the aggregate WLAs, and compliance will be required as soon as possible pursuant to 40 CFR 122.47.

4.2 Contingencies

The Department of Environmental Quality's Compliance and Enforcement Program for wastewater permit requirements is the mechanism that will be employed to ensure timely implementation to achieve waste load allocations.

4.3 Tracking and Reporting Protocols

In general, Bay wastewater dischargers are required to track and report under their discharge permits, both the Watershed General Permit for annual loads and individual permits for concentration-based nutrient limits.

The specifics of current annual reporting requirements for dischargers under the Watershed General Permit are:

By February 1 each year, the permittee shall either individually or through the Virginia Nutrient Credit Exchange Association file a report with DEQ. The report shall identify:

- The annual mass load of total nitrogen and the annual mass load of total phosphorus discharged by each of its permitted facilities during the previous calendar year.
- The delivered total nitrogen load and delivered total phosphorus load discharged by each of its permitted facilities during the previous year.
- The number of total nitrogen and total phosphorus credits for the previous calendar year to be acquired or eligible for exchange by the permittee.

Dischargers under the Watershed General Permit are also required to annually submit to DEQ, either individually or through the Virginia Nutrient Credit Exchange Association, an update to their compliance plans for approval. The compliance plans must contain sufficient information to document a plan for the facility to achieve and maintain compliance with applicable total nitrogen and total phosphorus waste load allocations.

As part of the Nutrient Credit Exchange Program, DEQ is required to report results of wastewater nutrient monitoring and credit availability by April 1 of each year for the prior year's annual loads. Then, on or before July 1 of each year, DEQ must publish notice of all nutrient credit exchanges and purchases for the previous calendar year and make all documents relating to the exchanges available to any person requesting them. Both of these reports are made available on DEQ's nutrient trading webpage http://www.deq.virginia.gov/vpdes/nutrienttrade.html.

SECTION 5. AGRICULTURE

5.1 Phase II Strategies

5.1.1 Impacts to Phase I Strategies

- Securing sufficient funding to meet agricultural targets: ensure sufficient funding and staff to reach agricultural reduction targets.
    - DCR will supplement the current year cost-share funding by adding approximately $15.5 million for the 47 SWCDs. This additional funding was allocated in January 2012. Of this additional amount, $3 million will be added for livestock exclusion, $2 million for the local agricultural implementation of TMDLs, $2million for animal waste practices and the remainder to the general application fund for agricultural BMP implementation. Technical assistance funding to SWCDs is also included. Furthermore, increasing the cost-share funding percentage for certain practices named in the Phase I WIP such as livestock exclusion is being considered for next year.
    - The Virginia Department of Agriculture and Consumer Services (VDACS) has filled two additional full-time positions to assist the commissioner with the implementation of the Agricultural Stewardship Act (ASA) Program. These positions will provide faster responses to water quality complaints concerning agricultural activities, allow for an increased number of follow-up site visits to ensure stewardship measures are maintained, and provide more education and outreach opportunities to the agricultural community.
- Following through on Confined Animal Feeding Operations (CAFO) and Animal Feeding Operations (AFO) plan commitments, including assistance with submitting Virginia Pollution Abatement (VPA) and VPDES permits; compliance assurance activities; and a DEQ/VDACS Memorandum of Agreement (MOA).
    - VDACS and DEQ are in the final stages of completing a strategy to manage water quality issues on small, unpermitted AFOs. The goal of this strategy is to better utilize the existing ASA program and the DEQ Animal Waste Permit program to identify, evaluate, and address concerns on these unpermitted sites. This strategy will be carried out through the development and implementation of a MOA between the agencies that is expected to be completed by December 31, 2012.
- Defining and implementing resource management plans (RMPs): Virginia is developing RMP regulations that will specify the criteria that must be included in a resource management plan and the processes by which a Certificate of RMP Implementation is issued and maintained. The regulations will provide for mechanisms to ensure that the practices implemented through these plans can be verified and that periodic inspections occur.
    - The RMP regulatory process has been moving forward in the Commonwealth. A diverse stakeholder regulatory advisory panel (RAP) was formed and provided input into the development of the draft proposed regulations, which was presented to the Virginia Soil and Water Conservation Board for their consideration on March 29, 2012 with final regulations targeted for presentation to the board in

December 2012 following consideration of public comment received. An expected implementation date is early 2013.

- Concurrent to final adoption of these regulations, DCR will develop implementation and reporting forms, guidance and RMP developer certifications. DCR will also work with the local SWCDs and the RMP developers to build program outreach plans to include providing RMP implementation incentives for farm operators and owners. DCR will continue work with the RMP RAP and SWCDs to incentivize the program. Prioritization of agricultural cost-share dollars and other incentives will be evaluated and added to the RMP program. Additionally, DCR will work with the SWCDs on standardized RMP review and site inspection procedures as well as developing its RMP final certification review procedures and SWCD program review methodologies.

5.1.2 Phase II Local Strategies

The agricultural sector information was included in the outreach package to the PDCs and local governments. The information included the model's land use acres, the number of agricultural BMPs reported for 2009, and the level of BMP implementation needed according to the Phase I WIP by 2025 in the localities. The localities, many working with SWCDs, were asked to verify the data, identify any errors, and report locally preferred implementation scenarios, strategies, and resource needs.

The information provided regarding land use will be used to help improve EPA's selection of a land use data set and classification system for the Phase 6 watershed model which is planned for deployment in 2017. Information provided by localities that updates the current BMP inventory will be incorporated into future progress reporting. Data provided offering a preferred implementation scenario for 2025 will be incorporated into the model input deck which will be submitted with this version of the WIP and is summarized in Appendix A.

Appendix B contains a series of tables listing locally proposed strategies for the agriculture sector. These strategies represent an aggregation and summary of the local strategies submitted for this sector. The timeline for completion of the Phase II WIP was not sufficient for vetting, public participation and local approval/adoption of strategies by localities. The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth. Rather, they are a menu of potential local actions that will be considered to address the Chesapeake Bay TMDL. Table B.1 includes the strategies that are focused on implementation of existing BMPs. Table B.2 focuses on capacity building strategies in the sector. Table B.3 lists strategies related to the development of new BMPs or technologies. Each table includes the BMP targeted, the strategy, and associated resource needs identified by the localities.

As can be seen by reviewing Tables B.1 – B.3, the strategies, resource needs and new BMPs identified for this source sector represent a broad spectrum of agricultural BMPs and funding needs. DCR staff has reviewed these proposed strategies and has identified several existing programs that can be used to implement them.

First, DCR coordinates a standing Agricultural Technical Advisory Committee (TAC), made up largely of representatives of SWCDs, pertinent state staff as well as sector experts on agricultural

practices. This group meets quarterly and the TAC's charge is to make recommendations as to which types of agricultural practices to prioritize for the receipt of cost-share support. The strategies and BMPs listed in Tables B.1 – B.3 will be forwarded to the DCR staff who serves as coordinator of this TAC so that he can, in turn, present them to the group for their consideration in identifying which practices to recommend for cost-share support.

Second, it is expected that the implementation of Resource Management Plans and voluntary data collection at the local level will significantly advance the agriculture strategies offered by local governments and SWCDs. In addition, Virginia is seeking to identify and record voluntary BMP's implemented by the agricultural community. Six pilot projects are ongoing within the state's 47 SWCDs to ascertain what mechanism yields the best voluntary data collection. DCR's agricultural BMP tracking program has already been modified to accept voluntary BMP's. This pilot effort ends June 30, 2012. Following this pilot effort, DCR will develop a common path and begin recoding voluntary practices for all SWCDs.

Third, in Tidewater Virginia, agricultural strategies will be advanced through the Bay Act requirement that local governments ensure that soil and water quality conservation assessments are conducted on active agricultural lands. These assessments involve an evaluation of existing practices (if any) and the identification of additional practices as needed to address nutrient and sediment runoff. Local compliance with this provision of the regulations is administered by DCR through Bay Act local compliance evaluations.

Finally, DCR is in the process of redefining policies on how technical assistance to SWCDs is allocated. Going forward, technical assistance will be targeted to SWCDs on a performance basis, the result of which will focus assistance to those SWCDs that are achieving the greatest success in getting agricultural BMPs "on the ground." As listed in the Code of Virginia, SWCDs receive eight percent of their cost-share allocation for technical assistance. Further, funding to augment SWCD capacity building has been steadily increasing during the last five years.

5.2 Contingencies

It is anticipated that the strategies outlined in Virginia's Phase I WIP, particularly the development of resource management plans and tracking of voluntarily installed BMPs, combined with a continued commitment to expanding the Agriculture Cost-Share Program will provide significant opportunities toward meeting the load allocations for the agricultural sector. If adequate progress is not achieved using those approaches, additional measures may be considered.

To encompass more area within the Bay Act, the state may encourage more Bay Act localities to adopt jurisdiction wide Chesapeake Bay Preservation Areas. Doing so would apply the Bay Act's agricultural provisions to a greater area within those Bay Act localities. These provisions mandate that these local governments require the completion of soil and water conservation assessments to determine if existing agricultural BMPs are adequate in controlling soil erosion and reducing nutrients. Should these assessments determine the need for additional or new agricultural practices such as nutrient management planning, then such plans must be developed and reviewed by the local SWCD.

In addition, the legislature could consider amending §58.1-3231 to require certain best management practices to be used on land enrolled in local use value assessment and taxation

programs. Land used for agriculture, horticulture or forestry purposes may be taxed using a special assessment based on current use rather than market value if the local governing body has adopted an ordinance in accordance with §58.1-3230 et seq. or if such land lies within an agricultural district, forestal district, or an agricultural and forestal district established under §15.2-4300 et seq. The value of this alternative real estate taxation is significant and almost all counties in the Chesapeake Bay watershed offer this reduced tax option on significant acreage. Implementation of practices which provide public benefit to water quality, including livestock stream exclusion, nutrient management plans, soil conservation plans or the implementation of RMPs, on lands eligible for such local use value assessment and taxation could be considered for additionally reduced alternative real estate taxation. This would provide an incentive to manage such lands in a manner protective of water quality.

5.3 Tracking and Reporting Protocols

Currently, agricultural BMPs are reported through the Agriculture Cost-Share Program Tracking Database. Data comes directly from the SWCDs to quantify conservation practices implemented using state cost-share. This information is ready for inclusion in the National Environmental Information Exchange Network (NEIEN). However, tracking only the cost-shared BMPs that are installed or practices employed leads to an underestimation of the nonpoint source controls being implemented by the agricultural sector.

BMPs voluntarily adopted by farmers without federal or state cost share assistance need to be tracked and reported as well. Six pilot SWCDs have been engaged to begin the voluntary practice tracking process. They are developing individual voluntary tracking protocols and will be gathering voluntary BMP data to include in the existing tracking database. As the pilot phase ends in June 2012, the six SWCDs will present their findings to DCR and other stakeholders. From these pilot work efforts, DCR will choose the most appropriate path to gather this information across the Bay watershed.

Additionally, nutrient management plan acres need to be included in NEIEN and work is underway to add data in a digital format. DEQ currently tracks poultry litter transport between counties in Virginia. Whether through increased cooperation with DCR reporting or the direct reporting by DEQ to NEIEN, the reporting of transport within county boundaries and the reporting of biosolids applications to agricultural fields needs to be included in the NEIEN reporting. Water Quality Improvement Fund projects are tracked and placed in the Agricultural Cost-Share Program Tracking Database for reporting through NEIEN.

SECTION 6. URBAN/SUBURBAN STORMWATER

6.1 Updated Phase I Strategies

6.1.1 Impacts to Phase I Strategies

The 2010 Chesapeake Bay TMDL improperly established individual waste load allocations for large MS4s in Virginia which was contrary to the approach used by EPA for all other Bay jurisdictions. The individual allocations also resulted in the absence of allocations for small MS4s that may fall within a larger MS4's geographic boundaries. This WIP proposes that individual MS4 allocations should be removed in the 2012 revision to the TMDL and replaced

with aggregate waste load allocations for all MS4s, both large and small, in a segment shed in order to rectify this issue. This change is supported by the MS4 strategies in this document.

Virginia has been working with EPA to develop a more reasonable approach to MS4s and the TMDL. Specific agreements regarding Phase I permit requirements over three permit cycles are discussed further in this section.

In September 2011, EPA conducted a review of Virginia's urban stormwater programs. At the same time, the management of the programs underwent an internal restructuring. The draft assessment of Virginia's urban stormwater programs as presented in December 2011 failed to capture the changes in program management and resulting progress made in program implementation. After discussion with EPA, Virginia submitted comments on the draft assessment in December 2011 and currently awaits a final assessment. In late March 2012, EPA provided a draft final assessment to Virginia. As a result of ongoing EPA discussions and upon receipt of a final assessment from EPA, Virginia expects to work with EPA on a memorandum of understanding (MOU) regarding the current status and future expectations of Virginia's urban stormwater regulatory programs.

Statewide Stormwater Management Regulations

As reported in the Phase I WIP, stormwater management for development and redevelopment is currently being regulated in Virginia through: MS4s, Erosion and Sediment Control (E&S), and Virginia Stormwater Management Program (VSMP) permits, as well as the stormwater provisions of the Bay Act. It was also reported that statewide stormwater management regulations were in the process of being revised and that, when implemented, these regulations should address the sediment and nutrient loads and stormwater quantity issues related to new development and redevelopment over the entire Chesapeake Bay watershed. These revised post construction stormwater regulations will impact new and redeveloped land disturbing projects equal to or greater than one acre, except in areas covered by the Bay Act, where the minimum disturbance is greater than or equal to 2,500 square feet. For redevelopment projects of over one acre, 20 percent required phosphorus and associated nitrogen and sediment reduction is required in the Virginia Stormwater Management Regulations.

Revised Virginia Stormwater Management Regulations were approved and became effective on September 13, 2011. The date by which local governments are expected to implement the regulations is July 1, 2014, to coincide with the reissuance of the construction general permit. Local programs must be approved by the Virginia Soil and Water Conservation Board by July of 2014. Programs need to be developed and approved by local boards and councils well in advance of that date. The regulations are applicable statewide.

An extensive education and outreach campaign began in November 2011 to communicate the benefits of localities adopting the provisions of these regulations, the specific criteria of the revised regulations, and the tools and assistance the state will provide to local programs. DCR staff has now visited 108 Virginia localities that do not currently have post construction stormwater programs and will continue outreach to localities throughout the state through 2014 and beyond. Outreach via several conferences and meetings are scheduled for the spring of 2012. Additionally, regional meetings through PDCs and SWCDs statewide as well as individual locality meetings will continue through implementation in July 2014.

DCR has also initiated a "Stormwater Regulation Roll-Out" process that will include the development of a comprehensive, multi-phased education and training program for local government staff and private sector engineers. It also includes developing a tool box for local governments to use in the establishment of their local stormwater programs. Included in this tool box will be a model ordinance, checklists of minimum local program provisions and template plan review checklists, among other items. In addition, the agency is identifying a number of funding sources to assist with local government program development costs.

As a result of the restructuring of stormwater program management and the revised regulations, DCR's current Erosion and Sediment Control Training Program will be revised and updated to include post construction stormwater. This process has begun with a first phase of "Train the Trainer" to ensure that DCR regional and central office stormwater staff are trained in the revised regulations and the associated changes in criteria and calculation methodologies including the use of the Runoff Reduction Method. These training sessions began in November 2011 and are ongoing. A two-day program was held for DCR stormwater regional and central office staff in conjunction with the Center for Watershed Protection and the Chesapeake Stormwater Network in February 2012 concentrating on the Runoff Reduction Method and plan review. The next step is to break down the existing training presentations into modules (e.g. Hydrology, Modeling Options, and Runoff Reduction Method) that will be presented to DCR regional staff and developed into webinars to be provided on the DCR website.

Planned additional phases include providing training to locality staff, private stormwater engineers and professionals, the revision of the current plan reviewer course, and the development of a separate post construction stormwater class to reflect the revised regulations. The planned phases are designed to build upon each other to provide a well developed certification program for post construction stormwater. A two-day post-construction stormwater certification course is envisioned which will become a component to the existing Erosion and Sediment Control Certification Program creating a full service regulatory stormwater certification program for the Commonwealth.

Key provisions of the approved regulations include:

- A revised phosphorous limit of 0.41 lbs/acre/year for new development.
- 20 percent reduction of phosphorous on redevelopment greater than an acre.
- 10 percent reduction of phosphorous on redevelopment less than an acre.
- Provisions for stream channel and flood protection.
- Shifting responsibility for compliance with Virginia Stormwater Management Permit criteria on private construction sites from the state to local governments.
- Identification of who is responsible for plan review and approval, inspection, and enforcement at the local government.
- Inspection and monitoring of construction activities for compliance with local ordinances, as well as inspections for compliance with the general permit conditions.
- Requirements for long term inspection of permanent stormwater facilities.
- Collection, distribution, and expenditure of fees.
- Reporting and record keeping requirements.

Section 10.1-603.7 of the Stormwater Management Act authorizes localities to adopt a more stringent stormwater management ordinance to ensure compliance with the act and attendant regulations. This section also provides guidance under which conditions a locality may adopt a more stringent ordinance. Localities have the opportunity to develop stricter ordinances requiring the installation of BMPs in existing urban areas. In addition, localities also have the ability to adopt more stringent criteria for water quality and quantity control to meet the loads and waste loads for a segment shed.

The Commonwealth is working with EPA to develop an MOU on Virginia's urban stormwater regulatory programs. In the expected MOU, a timetable for implementation of a compliance management strategy for the stormwater construction program will be detailed. Virginia has submitted a draft compliance management strategy to EPA and awaits comment. After July 2014, local programs will be managing plan review and site inspections for the post construction stormwater program. DCR will then be in an oversight role of the programs and will focus on compliance management and effective program implementation.

MS4 Permits

The expected MOU between Virginia and EPA may include a strategy and proposed schedule for the development of proposed permits for all eleven administratively continued Phase I MS4s in the Commonwealth. Virginia has begun the progress by submitting a draft template Phase I permit. This template will serve as a basis for the development of the additional ten permits. Significant progress toward the issuance of all eleven permits will be made in 2012. The MOU will also include a schedule for development of a compliance management strategy for the MS4 program. The compliance management strategy for the MS4 program is currently being drafted with EPA input.

In addition to DCR's continued attention to implementation of the Phase I MS4 individual permits, the department has also begun the process for revising the Phase II MS4 general permit. On May 24, 2011, the Virginia Soil and Water Conservation Board authorized the filing of a NOIRA related to the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems. This regulatory action is being initiated as regulations developed under the federal Clean Water Act (33 USC §1251 et seq.) and §10.1-603.1 et seq. of the Code of Virginia require that VSMP permits be effective for a fixed term not to exceed five years (§10.1-603.2:2 (B)). The existing 5-year General Permit became effective on July 9, 2008; thus necessitating the regulatory promulgation of a new General Permit before the July 8, 2013 expiration date. The Notice of Intended Regulatory Action for the new General Permit has been issued and initial 30-day public comment began March 26, 2012. The department anticipates formulating a regulatory advisory panel to assist in the development of a proposed general permit in the coming months and will be working in good faith towards having a new general permit in place within the required timeline.

The Commonwealth will utilize MS4 permits to ensure BMP implementation on existing developed lands achieves nutrient and sediment reductions equivalent to Level 2 (L2) scoping run reductions by 2025. Level 2 implementation equates to an average reduction of 9 percent of nitrogen loads, 16 percent of phosphorus loads, and 20 percent of sediment loads from impervious regulated acres and 6 percent of nitrogen loads, 7.25 percent of phosphorus loads and 8.75 percent sediment loads beyond 2009 progress loads for pervious regulated acreage. These reductions are beyond urban nutrient management reductions for pervious regulated acreage.

MS4 permits will provide flexibility in the implementation of specific management technologies employed to meet the required reductions, while stipulating standards and/or objectives. MS4 operators will be able to adjust the levels of reduction between pervious and impervious land uses within their service area, provided the total pollutant load reduction is met. For example, an MS4 could implement a five percent nitrogen load reduction on impervious land uses by implementing a reduction strategy sufficiently greater than six percent nitrogen load reduction on pervious land uses provided the total loads from both land uses are met. In addition, as a means to meet the pollutant reductions, it is anticipated that some permittees may consider incentives such as the Water Quality Improvement Fund and tax credits to encourage additional reductions beyond the L2 Level.

The Commonwealth will utilize enforceable MS4 permit language requiring MS4 operators to develop, implement, and maintain Chesapeake Bay Watershed Action Plans consistent with the WIP. MS4 operators will be given three full permit cycles (15 years) to implement the necessary reductions to meet the L2 implementation levels. Baseline efforts for all MS4s will be based upon 2009 progress loads. The baseline effort will be continued with an expectation of an additional five percent reduction of loads for existing developed lands to be met by the end of the first permit cycle. In addition, MS4 operators will be required to implement urban nutrient management plans on all lands owned and operated by the MS4 operator as specified under their permit during the first five-year permit cycle. MS4 operators will also be required to implement the revised stormwater management regulations for new and redevelopment projects on July 1, 2014.

During the first permit cycle, MS4 operators will develop a phased Chesapeake Bay Watershed Action Plan. The plan will include a review of the baseline program and include an outline of the means and methods that will be utilized to meet the L2 level necessary for the permit. The MS4 operator will also review its authorities, adopt and modify the necessary ordinances, and enhance its resources in order to implement the necessary reductions (e.g., develop design protocols, operation and maintenance programs, site plan review criteria, inspection standards, and tracking systems). As a part of reapplication for the second cycle of permit coverage, the MS4 operator will provide a schedule of implementation of the means and methods to implement sufficient reductions to reach 35 percent of the L2 reductions. As a part of reapplication for the third cycle of permit coverage, the MS4 operator will provide a schedule of implementation of the means and methods to implement sufficient reductions to reach the remaining L2 reductions by the end of the third permit cycle. DCR will work with MS4s on an individual basis to develop plans to achieve L2 reductions in each permit cycle including strategies for increasing BMP implementation levels.

DCR will work with MS4s to provide outreach and educational support to raise local knowledge. The training program and Stormwater Regulation Roll-Out outreach effort associated with the revised stormwater regulations will also benefit MS4s in providing technical assistance and training to the public and private sectors.

Urban Nutrient Management

As reported in the Phase I WIP, urban nutrient management represents a cost-effective approach to reduce nutrient loss from pervious urban lands. Virginia intends to maximize the implementation of urban nutrient management through a combination of actions. Implementation

of nutrient management plans is already required by the Code of Virginia on all state owned lands receiving nutrients.

During the 2011 Virginia General Assembly session HB 1831 was adopted. This milestone legislation instituted the following requirements into Virginia law:

- Prohibits the sale, distribution and use of lawn maintenance fertilizer containing phosphorus beginning December 31, 2013.
- Prohibits the sale of any deicing agent containing urea, nitrogen, or phosphorus intended for application on parking lots, roadways, and sidewalks, or other paved surfaces as of December 31, 2013.
- Requires the Board of Agriculture and Consumer Services to establish reporting requirements for contractor-applicators and licensees who apply lawn fertilizer to more than 100 acres of nonagricultural lands annually. The report will include the total acreage or square footage and the location of where the fertilizer is being applied.
- Requires golf courses to implement nutrient management plans by July 1, 2017 where they use fertilizer.
- Authorizes VDACS to develop consumer information and recommended best practices for the application of lawn fertilizer
- Requires VDACS to produce a report concerning the use of slowly available nitrogen in lawn fertilizer and lawn maintenance fertilizer
    - The slowly available nitrogen study was completed in December 2011. It is anticipated that the 2012 Session of the General Assembly will pass House Bill 1210 which, beginning July 1, 2014, allows the sale of only that lawn maintenance fertilizer that, when applied in accordance with its directions for use, results in the application of nitrogen at rates consistent with the nitrogen application rates recommended in the Virginia Nutrient Management Standards and Criteria. This statutory amendment was a recommendation of the slowly available nitrogen report. Regulatory actions implementing additional recommendations of the report are anticipated in the coming year.

This legislation advances many of the strategies identified in the Phase I WIP to reduce the nutrients generated through the use of fertilizer in the urban setting.

6.1.2 Phase II Local Strategies

The urban sector information was included in the outreach package to the planning districts and local governments. The information included the model's land use acres, the number of urban BMPs reported for 2009 and the level of BMP implementation needed according to the Phase I WIP by 2025 in the localities. The localities, many working with PDCs, were asked to verify the data, identify any errors, and report locally preferred implementation scenarios, strategies, and resource needs.

The information provided regarding land use will be used to help improve EPA's selection of a land use data set and classification system for the Phase 6 watershed model. Information provided by localities that updates the current BMP inventory will be incorporated into future progress reporting. Data provided offering a preferred implementation scenario for 2025 will be

incorporated into the model input deck which will be submitted with this version of the WIP, and is summarized in Appendix A.

Appendix C contains a series of tables listing locally proposed strategies for the Urban/Suburban Stormwater sector. These strategies represent an aggregation and summary of the local strategies submitted for this sector. The timeline for completion of the Phase II WIP was not sufficient for vetting, public participation and local approval/adoption of strategies by localities. The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth. Rather, they are a menu of potential local action that might be considered to address the Chesapeake Bay TMDL. Table C.1 includes the strategies that are focused on enhanced implementation of existing programs and BMPs. Table C.2 focuses on capacity building strategies in the sector. Table C.3 lists strategies related to the development of new BMPs or technologies. Each table includes the BMP targeted, the strategy, and associated resource needs identified by the localities.

The strategies, resource needs and new BMPs identified in Tables C.1 – C.3 fall into several general categories:

- Implementation of bioretention practices on public lands and promotion of these techniques on private lands through the review of development and redevelopment approval process.
- Programs to inventory and retrofit existing urban BMPs.
- Ordinance revisions to reduce impervious cover and to implement other strategies to minimize pollutants from new development and redevelopment.
- Riparian buffer establishment and urban forest management activities.
- Urban stream restoration.
- Shoreline erosion projects.

In general, localities currently have the authority to undertake these categories of strategies. The zoning, comprehensive plan, and subdivision provisions of the state's Counties, Cities and Town's section of the Code of Virginia provides local governments with the power and authority to manage the use and development of land and to protect local natural resources. In addition to these existing land use authorities, local governments are currently implementing the provisions of the Erosion and Sediment Control Law and the Bay Act through their local ordinances and in 2014 they will be implementing the provisions of the recently revised stormwater management regulations discussed above. This suite of state authorities and regulations provide a strong framework for local governments to use to advance many of the strategies identified in the Appendix C tables.

For example, through existing enabling legislation, localities have the authority to establish limits on parking, open space requirements and other measures to reduce impervious cover. The regulations pertaining to the Bay Act actually require local codes in Tidewater Virginia to include specific provisions to ensure that new development minimizes impervious cover, maintains indigenous vegetation, and minimizes land disturbance. However, there is currently no

enabling authority allowing localities to establish specific limits on impervious cover or to require urban BMP retrofits on existing land uses.

Through local implementation of the Commonwealth's Erosion & Sediment Control Law, local governments are ensuring that construction site runoff is being controlled. Beginning in July of 2014, local Erosion and Sediment Control programs will be significantly augmented by the addition of local stormwater requirements so that both construction and post construction runoff will be managed on a "one-stop-shop" basis, through local ordinance provisions and programs. Coordinated permitting and reporting is expected to greatly increase compliance with stormwater regulations.

Although these authorities and regulations provide a strong framework for the local strategies, the localities have identified several areas for which they need technical assistance, new or additional funding and enabling authority. As previously indicated, DCR has a plan in place to provide comprehensive training in the area of stormwater management. Through the agency restructuring, a new Regulatory Programs Office has been established, with a section (and staff) dedicated to providing tools and technical assistance to local governments in their development of programs to comply with the various regulatory programs. Tools such as model ordinances, site plan review checklists, template tracking databases and technical guidance are in the process of being developed. DCR staff will assess the resource needs table for those items requesting technical assistance and guidance and add those items to the on-going DCR "program development" tasks.

DCR is also in the process of identifying and assessing existing and potential future grants and other funding sources to address the funding and capacity needs that many of the local governments identified as necessary to help them advance the local strategies.

To address many of the urban program funding needs, existing regulatory authority allows for localities to establish stormwater utility fees, service districts, or pro-rata fee programs to address sediment and nutrient loads associated with stormwater runoff pursuant to Section 15.2 et seq. of the Code of Virginia. The fees, if collected, can be used to finance stormwater management projects to address the quality and quantity of stormwater runoff.

House Bill 1221, enacted by the 2010 Virginia General Assembly, allows for loans to be made to a local government from the Virginia Water Facilities Revolving Loan Fund for the purpose of constructing facilities or structures or implementing other best management practices that reduce or prevent pollution of state waters caused by stormwater runoff from impervious surfaces.

Beginning in 2012, DCR is actively working to identify grant funding to assist localities in developing local programs to comply with the revised Stormwater Management Regulations. When available these funds will be used to provide assistance in ordinance development and to build local technical capacity for stormwater management. This funding should address many of the capacity building needs identified in Table C.2.

DCR staff will also work to identify existing federal sources of funding and technical assistance geared toward assisting localities with Chesapeake Bay TMDL strategies. It is imperative that additional federal funding be provided to the jurisdictions to meet the reduction goals specified by this TMDL.

No legislative proposals have been introduced at this time to address gaps in existing enabling authority for some of the strategies listed. Determining when such legislative proposals might be advanced depends on many factors which include the health of Virginia's economy and the availability of federal funding.

6.2 Contingencies

Collectively, the stormwater management programs and actions set forth in this implementation plan represent a significant step forward in managing urban sources of nutrients and sediments. Additional actions that could be employed if allocations are not met could include, but are not limited, to the following:

- Consider adjusting allowable post development loads further on new development through stormwater management requirements that call for post construction stormwater to preserve and restore site hydrology and implement BMPs necessary to control the discharge of pollutants in stormwater to the maximum extent practicable and any more stringent requirements necessary to meet water quality standards.
- Consider requiring new post development loads to be lower than the pre-development loads.
- Consider establishing impervious cover limits or open space requirements that preserve and restore site hydrology and implement BMPs necessary to control the discharge of pollutants in stormwater to a greater extent (this will likely require new state-wide enabling legislation).
- Establish requirements for enhanced vegetation and native plantings within required open space and pervious areas to boost function of pervious areas (this will likely require new state-wide enabling legislation).

6.3 Tracking and Reporting Protocols

One of the missing elements in capturing this sector's contribution has been inconsistent or nonexistent reporting of installed practices. A web-based Stormwater Management ePermitting System is being developed as a management tool for the new stormwater management regulations. When the regulations are implemented, the Virginia ePermitting System will track project information including: location, size of site, disturbed area, BMPs and area of treatment, date of plan reviews and approvals, inspection and enforcement documentation, permit issuance date, project termination, and fees paid. The website will allow local entry of data into the tracking database and allow DCR to consolidate locality data for submission to EPA.

DCR is developing the Virginia ePermitting System website to digitally track and report all urban and suburban BMPs. This effort is currently being funded with EPA Chesapeake Bay Regulatory and Accountability Program funds, which DCR will continue to need until the Virginia ePermitting System is fully developed. Data collected through this website will be provided in a digital format that can be uploaded to NEIEN. The MS4 localities must report installed BMPs as a condition of their permit and this direct input from localities could greatly improve the tracking of installed BMPs.

SECTION 7. ONSITE WASTEWATER

7.1 Phase II Strategies

7.1.1 Impacts to Phase I Strategies

The Phase I WIP focused on attempts to reduce the rate of growth in this sector through regulatory actions and proposed to offset some loads through an expansion of the Nutrient Credit Exchange Program. The specific strategies as described in the WIP are presented below with updates on the implementation of those strategies.

- Implement amendments to Virginia Department of Health (VDH) regulations for alternative systems. The amendments require a minimum 50 percent reduction in delivered N for all new small alternative onsite systems in the Chesapeake Bay watershed resulting in an effective delivered load to the edge-of-project boundary of 4.5 pounds TN/person/year. All large alternative onsite systems will demonstrate compliance with <3 mg/l TN at the project boundary.
    - The amendments described above entered a final adoption period on November 7, 2011, and took effect on December 7, 2011. Within those amendments are nitrogen reduction requirements for alternative onsite sewage systems. The regulatory section to comply with the nitrogen reduction requirements has a delayed implementation date of two years from the effective date of the amendments. Given the amendments' effective date of December 7, 2011, the nitrogen requirements for alternative onsite sewage systems will be effective December 7, 2013.
    - In the interim, VDH will develop guidance documents for implementing the nitrogen reduction requirements in the regulations.
    - These amendments also require operation and maintenance of alternative systems. That requirement is effective immediately upon adoption of the amendments and is retroactive to existing alternative systems as well. The new operation and maintenance requirements incorporate aspects of the "Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems" (Models 3 and 4). For instance, the owner of an alternative onsite sewage system (AOSS) is required to have that system visited by a licensed operator at a frequency determined in the regulations (typically once per year for single family dwellings). The operator must submit a detailed report of each inspection to VDH, including a summary statement affirming that the alternative system is or is not functioning properly. Maintenance contracts and renewable operating permits (i.e. Model 3) are not required for all alternative systems. However, VDH maintains an inventory of alternative systems and, through mandatory electronic submission of operator reports and other capabilities built into the database, the agency can track compliance for individual systems and take enforcement action when mandated inspections do not occur. It is not clear whether the agency has authority to require maintenance contracts for an AOSS and based on stakeholder input, renewable operating permits were not required for all alternative systems. Renewable operating permits are required for any AOSS with a design flow greater than 1,000 gallons per day or with direct dispersal of

effluent to groundwater. These permits last five years and must be renewed in order for the facility to continue operation. Model 4 management is required for all alternative systems that serve more than one dwelling or a dwelling with multiple living units. In order to obtain a permit for such a decentralized system, a single owner must be identified and that single owner is required to provide legal documentation to assure operation and maintenance of the system for the expected life of the dwellings.

- VDH is developing training to ensure that agency staff can implement the new operation, maintenance, inspection, and compliance provisions under the new amendments.

- The Phase I WIP included a number of suggested revisions to the Code of Virginia offered in this section as ways to gain additional nitrogen reductions that are currently outside the state's authority to implement. Suggestions included:
  - Require all new and replacement systems in the Chesapeake Bay watershed to utilize either (1) "shallow placed" systems capable of reducing nitrogen loss or (2) denitrification technology to reduce nitrogen loss and consider requirements for additional nitrogen reducing technologies in certain defined sensitive areas.
  - Promote the use of community onsite systems which provide a greater reduction of total nitrogen.
  - Establish five year pumpout requirements for septic tanks in jurisdictions within Virginia's Chesapeake Bay watershed (this mirrors the existing requirement for septic tanks within Chesapeake Bay Preservation Act areas).
  - Establish tax credits for upgrade/replacement of existing conventional systems with nitrogen reducing systems.
  - Encourage the use of currently authorized "Betterment Loans" for repairs to existing systems and explore other financial incentives or relief to encourage the upgrade of existing systems especially for low and moderate income households.

  No legislative proposals have been introduced at this time to implement any of the proposed revisions. Determining when such legislative proposals might be advanced depends on many factors which include the health of Virginia's economy and the availability of federal assistance. Establishing a timetable for legislation is not feasible at this time. These proposals will be reconsidered regularly as part of the milestone development process.

7.1.2 Phase II Local Strategies

The onsite sector information was included in the outreach package to the planning districts and local governments. The information included the number of onsite systems, the number of onsite wastewater BMPs reported for 2009, and the level of BMP implementation needed according to the Phase I WIP by 2025 in the localities. The localities, many working with PDCs, SWCDs, and local sanitarians, were asked to verify the data, identify any errors, and report locally preferred implementation scenarios, strategies, and resource needs. Additionally, VDH is working with EPA on identifying which alternative system designs should be counted as nitrogen reducing technologies. This information will be shared with the local health departments and localities so

that these systems can be identified and accurate reporting of nitrogen reducing systems to EPA can begin.

The information provided regarding land use will be used to help improve EPA's selection of a land use data set and classification system for the Phase 6 watershed model. Information provided by localities that updates the current BMP inventory will be incorporated into future progress reporting. Data provided offering a preferred implementation scenario for 2025 will be incorporated into the model input deck which will be submitted with this version of the WIP, and is summarized in Appendix A.

Appendix D contains a series of tables listing locally proposed strategies for the onsite wastewater sector. These strategies represent an aggregation and summary of the local strategies submitted for this sector. The timeline for completion of the Phase II WIP was not sufficient for vetting, public participation and local approval/adoption of strategies by localities. The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth. Rather, they are a menu of potential local action that might be considered to address the Chesapeake Bay TMDL. Table D.1 includes the strategies that are focused on implementation of existing BMPs. Table D.2 focuses on capacity building strategies in the sector. Table D.3 lists strategies related to the development of new BMPs or technologies. Each table includes the BMP targeted, the strategy, and associated resource needs identified by the localities.

Note that five of the seventeen local strategies listed above refer to septic pump outs. The Virginia Chesapeake Bay Preservation Area Designation and Management Regulations, 9 VAC 10-20-120 7 a , require that "On-site sewage treatment systems not requiring a VPDES permit shall….have a pump-out accomplished for all such systems at least once every five years." This applies to only those areas that the locality has identified as a Chesapeake Bay Preservation Area. This and other Bay Act requirements have been implemented through local ordinances in the Tidewater area (generally east of I–95) of Virginia since the early 1990s. Septic pump out information is reported to DCR through annual reports that are also required by these regulations. The two strategies in the table that propose adoption of ordinances to implement a septic pump out program have come from localities outside the area that is subject to the Bay Act. Other pump out strategies would call for the expansion of the pump out requirement to the entire locality, beyond the Chesapeake Bay Preservation Areas, or to improve the tracking and reporting of pump outs.

VDH plans to assist localities in identifying and assessing available grant funds, particularly EPA grants, to address the funding needs that many of the local governments identified as necessary to support the advancement of the local strategies.

7.2 Contingencies

The AOSS regulation was effective December 7, 2011 which provides for the regulation of nitrogen release from alternative onsite systems only beginning December 7, 2013. Should the regulation be modified and VDH loses the ability to regulate nitrogen from alternative systems, the burden will fall completely to localities to implement a nitrogen reduction program that accounts for the impact from the onsite sector. Modifications to the nutrient trading law may facilitate this if the law allows localities to trade to offset the local onsite load.

7.3 Tracking and Reporting Protocols

VDH will continue to refine its Virginia Environmental Information System (VENIS) database to identify nitrogen reducing installations and report them to EPA. A first report of systems that comply with the 50 percent reduction requirement was delivered December 2011. The first report identified NSF 245 treatment units that have been tested to demonstrate a 50 percent nitrogen removal for small systems.

VDH will continue to operate and expand the online reporting capabilities of VENIS to enable licensed operators to report operation and maintenance activities directly, including pump outs for all systems, not just alternative systems. VDH will also work with DCR and local governments to more fully capture and report the number of pumpouts and connections. DCR currently tracks pump out practices associated with small watershed TMDL implementation grants through the cost-share program. DCR also reports on the pump out progress for all Bay Act localities. At this time, all existing data is submitted to EPA's NEIEN by DCR. However, greater coordination is needed between VDH and DCR to capture additional BMPs not currently tracked by DCR.

SECTION 8. FOREST LANDS

Virginia's WIP values afforestation, establishing new forest on open land, as a BMP that achieves water quality improvement principally through the establishment of riparian forest buffers and afforestation of marginal agricultural lands. Afforestation should meet the criteria for inclusion as a BMP. New forests provide additional nutrient load reduction services that were not present in a watershed prior to project implementation. However, existing forestland is not currently credited for water quality protection in the WIP. Even as new forests are created through BMPs implemented pursuant to the WIP, Virginia continues to experience a net loss of approximately 16,000 acres of forestland per year, based on a rolling ten year average, according to Forest Inventory Analysis. This forestland loss impacts nutrient and sediment loads and overwhelms the ability of afforestation to keep pace with nutrient and sediment load reduction targets on a landscape scale. Developing strategies that influence the rate of forestland conversion is of great importance in the context of protecting water quality over the long term.

With the obligation to meet nutrient and sediment loads contained in the Chesapeake Bay TMDL, Virginia has an opportunity to incorporate into the Phase II WIP strategies to slow or reverse the loss of forestland and the associated water quality benefits. Such strategies would recognize the direct value that forests provide for water quality, with such ancillary benefits as water infiltration and storage, biodiversity, carbon sequestration, air quality, pollination, and others.

Virginia will examine WIP strategies that not only will result in nutrient and sediment reductions but will also maintain forest cover that protects water quality over the long term. These strategies could include land conservation, forest preservation, and afforestation.

Possible strategies related to forest conservation and afforestation includes the following:

- Forest conversion for the purposes of developing municipal infrastructure (power lines, highways, government buildings, etc.) or forest conversion on government owned land may represent opportunities to offset forestland conversion. Currently, the Virginia Department

of Forestry (VDOF) has developed a Forest Valuation Instrument to provide the necessary metrics and valuation in order to assess losses due to forest conversion including not only fiber (sawtimber, pulpwood), but also including an estimate of gain/loss in forest ecosystem service provisions including water quality and quantity (flood attenuation, precipitation retention and groundwater recharge, nutrient cycling and retention), flora and fauna diversity, carbon sequestration, aesthetic, and community social values. The Forest Valuation Instrument will be leveraged in the effort to offset forestland loss.

- In addition to offsetting conversion of working forests, there exists the opportunity to include strategies in urban and suburban areas that impact tree canopy and urban forest cover. Several localities in Virginia have strong tree preservation ordinances that value the environmental benefits associated with tree cover. Gaining recognition in the model for an urban locality's effort to preserve, enhance, and maintain the urban tree canopy is critically important. Strategies in the action plan to manage conservation of urban tree canopy and retention of urban forest cover could include identification of priority areas for retention, setting percent forest cover retained guidelines for development, and replanting cleared areas. Priority areas for retention would include flood plains, intermittent and perennial streams, steep slopes, and critical habitats. An urban and community forest retention strategy will reduce the rate of tree canopy and urban forestland loss as population growth increases.

8.1 Phase II Strategies

Create a forest conversion workgroup by August 31, 2012 to develop an "action plan" with the objective of developing strategies for incorporation into the Phase II WIP that offset the impacts of forestland conversion to more intensive land uses.

Work with EPA, Bay jurisdictions, and others to determine the feasibility of achieving credited TMDL nutrient or sediment reductions from conserving existing forestland in the context of the Chesapeake Bay model and if successful, establish future TMDL milestones.

8.1.1 Impacts to Phase I Strategies

In addition to the Phase I WIP commitments of increased effective BMP implementation on logging operations and continued logger education, developing strategies that influence the rate of forestland conversion is of great importance for protecting water quality over the long term.

8.1.2 Phase II Local Strategies

The forest sector information was included in the outreach package to the planning districts and local governments. The information included the model's land use acres, the number of forest BMPs reported for 2009 and the level of BMP implementation needed according to the Phase I WIP by 2025 in the localities. The localities, many working with PDCs, SWCDs, and local foresters were asked to verify the data, identify any errors, and report locally preferred implementation scenarios, strategies and resource needs.

The information provided regarding land use will be used to help improve EPA's selection of a land use data set and classification system for the Phase 6 watershed model. Information provided by localities that updates the current BMP inventory will be incorporated into future progress reporting. Data provided offering a preferred implementation scenario for 2025 will be

incorporated into the model input deck which will be submitted with this version of the WIP, and is summarized in Appendix A.

Appendix E contains a series of tables listing locally proposed strategies for the Forest Lands sector. These strategies represent an aggregation and summary of the local strategies submitted for this sector. The timeline for completion of the Phase II WIP was not sufficient for vetting, public participation and local approval/adoption of strategies by localities. The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth. Rather, they are a menu of potential local action that might be considered to address the Chesapeake Bay TMDL. Table E.1 includes the strategies that are focused on implementation of existing BMPs. Table E.2 focuses on capacity building strategies in the sector. Table E.3 lists strategies related to the development of new BMPs or technologies. Each table includes the BMP targeted, the strategy and associated resource needs identified by the localities.

VDOF is in the process of identifying and assessing available grant funds, particularly EPA grants, to satisfy the funding needs that many of the local governments identified as necessary to assist with the advancement of the local strategies.

8.2 Contingencies

No contingencies are necessary or anticipated.

8.3 Tracking and Reporting Protocols

VDOF currently has a system in place to monitor BMP implementation as well as compliance with the Commonwealth's Silvicultural Water Quality Law. The data is kept in a spreadsheet, which is not conducive to the large amount of data analysis needed. Existing data needs to be exported into a database for easier data analysis and report generation. The VDOF currently has mobile data collection capability, which needs to be increased to capture the information required of the BMP monitoring effort.

Reporting should be done using the format that currently supports data collection for BMP implementation. This presents an opportunity to develop a statewide reporting system that could be expanded to collect relevant data from all the sectors.

An annual report is compiled by VDOF and is available at www.dof.virginia.gov or by request. It is anticipated that a five year report will also be developed and published for public consumption. This report, or portions of it, could be submitted to EPA or combined with information from the other nonpoint source sectors into a single report for EPA.

SECTION 9. RESOURCE EXTRACTION

9.1 Phase II Strategies

The Virginia Department of Mines, Minerals and Energy (DMME) will continue to seek funding and partnership opportunities to increase the restoration of orphaned mineral mines (Orphaned Lands Program (OLP) sites) focusing on locations where other pollution impairments exist and implementation plans are in place. An Advisory Committee prioritizes OLP site restoration based on their location within high priority watersheds and the likelihood of funding through both private and governmental cost-share and tax credit programs. Partnerships with the Virginia

Department of Game and Inland Fisheries and VDOF can be useful in restoring OLP sites, as two of the conversions are to wildlife habitat (quail) and successional forest.

DMME will work closely with local governments to raise awareness and understanding of the nature and value of their geologic resources. This may be accomplished by improving resource documentation in locality comprehensive plans, increasing the local knowledge base and improving the decision making process through greater understanding of the impacts of mining activities on water resources.

9.1.1 Impacts to Phase I Strategies

Operators of active mines and well sites are required by state law to implement management practices that control the release of sediment from the site and require compliance with current state and federal effluent standards for point source discharges. These requirements are documented in the Phase I WIP. Before receiving a permit to disturb a site, all erosion and sedimentation controls must be in place, with regular monitoring during the active mining phase. Reclamation plans might include stabilizing the site, planting pasture and trees, and stream restoration which may result in decreased sediment loads.

9.1.2 Phase II Local Strategies

DMME will continue to evaluate opportunities to restore OLP sites. Working with landowners to restore these sites requires extensive partnerships, research, evaluation, and diverse funding. DMME will also evaluate new coordination opportunities with local governments to better understand their geologic resources and the BMPs used to protect water resources in their vicinity.

The surface mining sector information was included in the outreach package to the planning districts and local governments. The information included the model's land use acres, the number of resource extraction BMPs reported for 2009 and the level of BMP implementation needed according to the Phase I WIP by 2025 in the localities. The localities, many working with PDCs and DMME officials, were asked to verify the data, identify any errors, and report locally preferred implementation scenarios, strategies, and resource needs.

The information provided regarding land use will be used to help improve EPA's selection of a land use data set and classification system for the Phase 6 watershed model. Information provided by localities that updates the current BMP inventory will be incorporated into future progress reporting. Data provided offering a preferred implementation scenario for 2025 will be incorporated into the model input deck which will be submitted with this version of the WIP and is summarized in Appendix A.

Appendix F contains a series of tables listing locally proposed strategies for the resource extraction sector. These strategies represent an aggregation and summary of the local strategies submitted for this sector. The timeline for completion of the WIP II was not sufficient for vetting, public participation and local approval/adoption of strategies by localities. The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth. Rather, they are a menu of potential local action that might be considered to address the Chesapeake Bay TMDL. Table F.1 includes the strategies that are focused on implementation of existing BMPs. Table F.2 focuses on capacity building strategies in the sector.

Table F.3 lists strategies related to the development of new BMPs or technologies. Each table includes the BMP targeted, the strategy and associated resource needs identified by the localities.

DCR is also in the process of identifying and assessing available grant funds, particularly EPA grants, to address the funding needs that many of the local governments identified as necessary to assist with the advancement of the local strategies.

9.2 Contingencies

Increasing the number of inspectors, reclamation sites, and stream restorations may contribute to reductions of sediment across the Bay watershed.

9.3 Tracking and Reporting Protocols

Tracking the compliance of VPDES general permit holders is currently done by DEQ, while DMME tracks compliance with their own permit holders. Periodically, the facilities are inspected to ensure compliance with their permit conditions. Facilities must report on a regular basis and show their schedules for reclamation of disturbed sites. As resources are available, an expansion in the reclamation of older abandoned sites could be pursued to include stream restoration and site stabilization. These reclamation opportunities and their progress would be tracked by DMME and the progress supplied for each Bay TMDL milestone reporting period. Currently, DMME is developing an inventory of abandoned mines and reclamation work that is being driven by local TMDLs.

SECTION 10. FEDERAL FACILITIES

Federal lands and facilities represent approximately 12.3 percent of all land in Virginia's Chesapeake Bay watershed. They include more than 200 facilities, owned or managed by over a dozen federal agencies. While many of these federal holdings are parks, forests and wilderness areas, they also include many highly impervious facilities.

10.1 Phase II Strategies

In accordance with Executive Order (EO) 13514, Energy Independence and Security Act (EISA) §438, and EO 13508, all federal facilities are required to demonstrate leadership and commitment to controlling pollution, leveraging their expertise and resources to contribute significantly to improving the health of the Chesapeake Bay. Federal facilities should take all actions necessary to ensure that receiving waters are not negatively impacted by activities on federal lands.

Virginia will work with the Department of Defense (DoD) and other federal agencies in the joint development of a MOU, formalizing DoD's and the federal agencies' commitment to leading by example in meeting Chesapeake Bay water quality goals and achieving the necessary reductions called for by the Bay TMDL.

The Commonwealth will utilize MS4 permits to ensure that BMP implementation on existing developed regulated federal lands achieves nutrient and sediment reductions equivalent to Level 2 scoping run reductions by 2025, or a more stringent level agreed to by the Commonwealth of Virginia, the EPA and the federal agencies pursuant to EO 13508, EISA §438 and EO 13514 and in accordance with the MOU mentioned above. Level 2 implementation equates to an average

reduction of 9 percent of nitrogen loads, 16 percent of phosphorus loads, and 20 percent of sediment loads from impervious regulated acres and 6 percent of nitrogen loads, 7.25 percent of phosphorus loads and 8.75 percent sediment loads beyond 2009 progress loads for pervious regulated acreage.

Federal MS4 operators, like other MS4s, will be given three full permit cycles (15 years) to implement the necessary reductions to meet the L2 implementation levels. Baseline efforts will be based upon 2009 progress loads. The baseline efforts will be continued with an expectation of an additional five percent reduction of loads for existing developed lands to be met by the end of the first permit cycle. As a part of reapplication for the second cycle of permit coverage, the MS4 operator will provide a schedule of implementation of the means and methods to implement sufficient reductions to reach 35 percent of the L2 reductions. As a part of reapplication for the third cycle of permit coverage, the MS4 operator will provide a schedule of implementation of the means and methods to implement sufficient reductions to reach the remaining L2 reductions by the end of the third permit cycle.

10.1.1 Impacts to Phase I Strategies

The Phase I WIP called for federal facilities with MS4 permits to assure BMP implementation on existing developed regulated federal lands to achieve nutrient and sediment reductions equivalent to Level 3 scoping run reductions by 2025. Level 3 implementation equates to an average reduction of 18 percent of nitrogen loads, 32 percent of phosphorus loads and 40 percent of sediment loads from impervious regulated acres and 12 percent of nitrogen loads, 14.50 percent of phosphorus loads and 17.5 percent of sediment loads beyond urban nutrient management reductions for pervious regulated acreage. This level has been modified as indicated above. This change has no impact on the load reductions or allocations that resulted from the Phase I WIP because the model used at that time was not capable of differentiating federal lands and was run based on Level 2 implementation on all urban lands.

10.1.2 Phase II Facility Strategies

The federal lands information was included in the outreach package to the planning districts, local governments, and federal partners. The information included the model's land use acres, the number of BMPs reported for 2009, and the level of BMP implementation needed according to the Phase I WIP by 2025. Federal land holders were asked to verify the data, identify any errors, and report preferred implementation scenarios, and strategies for implementation.

While only 39 percent of federal departments in the Bay watershed provided feedback to our data request by the submission deadline, those responding represented approximately 90 percent of the 1.7 million acres of federal lands. Most of the agencies and facilities that responded focused on providing updated land use information and cataloging existing BMPs, with only a few offering 2025 implementation scenarios or strategies for that implementation.

In part, the incomplete federal response is due to the lack of adequate modeling tools for use by federal facilities. The most recent version of the Bay model shows federal facilities in the aggregate and does not show specific facilities. Furthermore, the land use associated with the federal holdings is represented in the model as proportional to the land use in the surrounding county. These limitations in the model significantly impacted the ability for federal facilities to understand their share of the pollution reductions required to meet the TMDL. Several federal

agencies developed alternative methodologies for assessing current loads from their facilities based on the actual land uses that exist. They were then able to estimate the reductions that might result from implementation of BMPs. These efforts are commended, and may serve as a reasonable approach to be followed by other federal agencies pending revision of the model.

Ultimately, the watershed model should be updated at the earliest opportunity to correct the federal land use information and to further segment federal holdings by facility or agency. Associated refinement to VAST should follow. This would allow federal facilities the opportunity to use the VAST as an implementation planning tool in future milestone development efforts.

Development of strategies and projections for implementation by 2025 for federal facilities as well as future milestones will be addressed as part of the ongoing engagement of Federal partners in support of the Chesapeake Bay TMDL planning process. These efforts will include continuing outreach, data sharing and coordination with localities.

10.2 Contingencies

As outlined in Executive Order 13514, Energy Independence and Security Act §438, and Executive Order 13508, restoration of the health of the Chesapeake Bay will require a renewed commitment to controlling pollution from all sources as well as protecting and restoring habitat and living resources, conserving lands, and improving management of natural resources, all of which contribute to improved water quality and ecosystem health. The Federal Government should lead this effort. Executive departments and agencies, working in collaboration, can use their expertise and resources to contribute significantly to improving the health of the Chesapeake Bay.

Progress in restoring the Chesapeake Bay also will depend on the support and cooperation of state and local governments, the enterprise of the private sector and the stewardship provided to the Chesapeake Bay by all the people who make this region their home. Federal agencies with land, facilities or installation management responsibilities affecting ten or more acres within the watershed of the Chesapeake Bay shall, as expeditiously as practicable and to the extent permitted by law, implement land management practices to protect the Chesapeake Bay and its tributary waters consistent with the report required by section 202 of EO 13508 and as described in guidance published by the EPA under section 502 of the EO. If sufficient progress in attaining the required reductions on federal lands is not achieved, the Commonwealth will expect that all federal facilities control the discharge of pollutants in stormwater to the maximum extent practicable and any more stringent requirements necessary to meet water quality requirements of the Federal Water Pollution Control Act.

10.3 Tracking and Reporting Protocols

Executive Order 13508 requires the Federal Leadership Committee (Committee) to publish an annual Chesapeake Action Plan (Action Plan) describing how federal funding proposed in the President's Budget will be used to protect and restore the Chesapeake Bay during the upcoming fiscal year. The action plans identify activities that federal agencies, at the agency and facility levels, will undertake in the following year to carry out actions and achieve the goals and outcomes outlined in the EO 13508 Strategy and the Phase II WIP. This plan will be accompanied by an Annual Progress Report reviewing indicators of environmental conditions in

the Chesapeake Bay, assessing implementation of the action plan during the preceding fiscal year, and recommending steps to improve progress in restoring and protecting the Chesapeake Bay. The committee shall consult with stakeholders and members of the public in developing the action plan and annual progress report. The Commonwealth anticipates that copies of these annual action plans and progress reports will be provided as part of federal coordination during the development of two-year milestones and annual progress tracking. While it is important for the federal plans and actions to be communicated to the local governments adjacent to the federal facilities and the state, direct reporting of federal implementation actions through the NEIEN should be explored.

SECTION 11. NEXT STEPS

11.1 Commonwealth of Virginia

The Commonwealth will have a public comment period on this document to give stakeholders and the public an opportunity to weigh in on the plan. The comment period will open April 1, 2012 and close May 31, 2012. In addition to the opportunity to provide written comment, the Commonwealth intends to conduct public meetings around the watershed to provide an overview of the planning process, the resulting WIP and the path forward. The intent of these meetings is to broaden the involvement of stakeholders through education and outreach, collect public comment and to refocus efforts toward implementation of the plan. If the comments result in substantive changes to the plan, the Commonwealth will provide EPA with an updated plan.

As discussed in Section 2.3 above, the Phase II WIP Project Team established local engagement teams that were assigned to localities and PDCs within the Chesapeake Bay watershed. The team members have expertise in agriculture, local government, local TMDL planning, stormwater management and general watershed management. As designed, the teams have thus far worked effectively with local government and PDC staff to provide expertise in these areas toward the development of local and regional strategies to address the Chesapeake Bay TMDL.

During the initial local engagement, the Commonwealth received feedback that the assistance and guidance provided by the engagement teams and central office staff was beneficial and appreciated, but could be improved.

Accordingly, it is our plan to refine the teams and continue to use this effective engagement model. Going forward, the engagement teams will continue their work with localities, PDCs, and SWCDs to provide follow up assistance and advise them of continued expectations for the Chesapeake Bay TMDL process as follows:

- Contact localities, PDCs, and SWCDs to assist as localities refine and prioritize their strategies for execution.
- The engagement teams will assist in the identification of potential funding sources, aid in development of new ordinances and support capacity building needed to bring the preferred strategies to fruition. The teams will also work with them to identify timelines for strategy implementation as well as the quantification of resources needs.
- Continue to work with the federal land holders in the watershed to identify opportunities to coordinate with local stakeholders. As federal partners refine their plans for BMP implementation, the information will be shared with localities. As localities identify

strategies for execution locally, federal landholders in the area will be encouraged to consider similar efforts. Building the collaborative relationships between federal, state and local stakeholders will be a priority as we move forward with Chesapeake Bay TMDL implementation.

- Continue efforts to expand and improve the capabilities of the Chesapeake Bay Watershed model. This will involve continuing review of model results to identify opportunities for improvement, introduction of new BMPs and technologies for inclusion in the model, and active participation in the Bay Program as the new model is developed. Land use information provided by localities as part of the Phase II data collection effort will be analyzed and shared with EPA to further these efforts.
- The Commonwealth remains committed to the established Bay TMDL accountability framework, its two-year milestone cyclical planning process and the principal of adaptive management. As local strategies are refined and scheduled for execution, they will be included as elements in the appropriate two-year milestone plan. The milestone plans are expected to provide additional detail and specificity of anticipated implementation, including timelines and cost assessments. They also provide an opportunity for adaptive management, altering course based on new information.

11.2 Localities

Going forward, the engagement teams will continue their work to assist localities with the following activities. These actions may be done locally or as a regional effort.

- Refinement and prioritization of strategies.
    - Localities can consider the strategies they developed as part of the Phase II process, along with any other strategies included in Appendix B-F, and develop a prioritized list for further review and development.
    - Localities can quantify the resource needs for strategy execution and work with engagement teams to identify potential funding sources or other needed support from the Commonwealth.
    - Localities, working from their prioritized list, can develop timelines for local vetting and board approval of strategies and actions.
    - Localities can share their strategy prioritization, adoption timelines, and identified resources with their engagement team to inform the Commonwealth's development of future milestones. Information will be needed by October 1 of odd years for inclusion in the following milestone period (October 1, 2013 for inclusion in 2014-2015 Milestones).
- Target implementation to reduce local water quality impairments and the Bay. Using local small watershed TMDL implementation plans, impaired waters listings and assistance from engagement teams, localities are encouraged to target implementation efforts to maximize benefits to local water quality.
- Develop systems to adequately track and report new BMPs. Data for implementation activities between July 1 and June 30 should be submitted by September 30 of each year for incorporation into annual progress runs.

  - Current BMP information provided as part of the Phase II data collection effort will be included in the 2012 progress report.
  - Engagement teams will work with localities to ensure maximum credit for reported BMPs.
- Public support of water quality initiatives is an important component to successful strategy approval, funding identification and BMP adoption and implementation. Education, outreach and marketing through stakeholder groups should be used as one tool to further this effort.

11.3 Implementation Tracking, Verification, and Progress Reporting

Through the local engagement process described earlier and the deployment of the VAST, PDCs and localities have developed an understanding of the data needs and mechanisms to aggregate and track their urban and agricultural BMPs. Many localities included strategies regarding the continued development of implementation tracking procedures and systems in their data submittals.

Current regulatory and funding programs will be used to verify the existence of BMPs. Through the Bay Act, local governments in Tidewater Virginia are required to ensure that urban BMP practices are maintained in a manner that ensures the BMPs continue to function as they were designed. Further, the Bay Act regulations require local governments to annually report continued compliance with all provisions of the act, including the stormwater management BMP maintenance provisions. Urban BMP maintenance is also a provision of the recently adopted stormwater management regulations. These two key regulatory mechanisms will ensure the verification, maintenance, and tracking of BMPs. Agricultural BMPs implemented through the cost share program are inspected to verify the practices meet specifications as part of the funding approval process. Additionally, those practices with longer life spans are spot checked to verify that they remain in place and functioning as designed.

A Stormwater Management ePermitting System website is being developed by DCR as a management tool for the new stormwater management regulations. When the regulations are implemented, the Virginia ePermitting System will track project information including: location, size of site, disturbed area, BMPs and area of treatment, date of plan reviews and approvals, inspection and enforcement documentation, permit issuance date, project termination date and fees paid. The implementation of the website will allow local entry of data into the tracking database and allow DCR to consolidate locality data in a format that will enable them to be incorporated in the Chesapeake Bay Watershed Model.

The Agriculture Cost-Share Program Tracking Database is a collaborative system that allows DCR and SWCDs to gather information about installed agricultural BMPs. The database has recently been updated to allow for easier tracking of voluntarily installed BMPs as well as those installed through the cost share program. This information is suitable for inclusion in the NEIEN for annual progress reporting. Ongoing refinements to the system related to voluntary BMPs and RMPs is anticipated.

APPENDIX A. PHASE II WIP BMP SUMMARY

Table A.1 Phase II WIP BMP Summary

Phase II WIP BMP Summary				
Source	**BMP**	**2009 Progress BMPs**	**2025 WIP I Proposed BMPs**	**2025 WIP II Proposed BMPs**
Agriculture	AWMS (Systems)	1,554	6,879	5,119
	Mortality Composters (Systems)	3	130	127
	Manure Transport (Tons Out of Watershed)	-	75,000	148,500
	Barnyard Runoff Control (Systems)	523	6,646	5,488
	Pasture Fence (Linft)	11,581,207	101,473,609	113,761,116
	Off Stream Water No Fence (Acres)	20,528	-	13,917
	Precision Rotational Grazing (Acres)	239,059	578,878	534,265
	Horse Pasture Management (Acres)	-	-	23,570
	Capture Reuse (Acres Treated)	-	4,059	3,753
	Conservation Plan (Acres) (Life of Plan)	926,138	1,774,084	1,883,053
	Ag Nutrient Management(Acres) (Life of Plan)	574,959	1,292,679	1,161,456
	Cover Crop (Acres) (Annual)	79,488	264,627	308,860
	Continuous NoTill (Acres)	33,994	306,962	304,400
	Non Urban Stream Restoration (Linft)	19,330	99,996	104,528
	Water Control Structure(Acres)	-	927	700
	Wetland Restore (Acres)	198	5,558	19,215
	Grass Buffers (Acres)	30,267	110,086	140,959
	Forest Buffers (Acres)	16,764	76,514	99,437
	Land Retirement to hyo (Acres)	83,114	127,485	102,542
	Tree Planting (Acres)	18,591	103,413	107,108
Urban	Street Sweeping (Acres) (Annual)	620	19,999	24,040
	Urban Nutrient Management (Acres) (Annual)	20,539	523,115	517,058
	E and S (Acres) (Annual)	13,569	24,854	32,922
	Bioretention	-	-	22,352
	Bioswale	-	-	1,144
	Permeable Pavement (Acres)	-	-	52
	Vegetated Open Channel (Acres)	-	-	3,283
	Dirt and Gravel Road (Linft)	-	-	1,738
	Impervious Urban Surface Reduction (Acres)	32	32,279	26,138
	Forest Buffer Urban (Acres)	-	-	4,115
	Forest Conservation (Acres)	-	-	14,128
	Urban Tree Planting (Acres)	-	-	799
	Urban Stream Restoration (Linft)	-	49,997	122,052
	Dry Ponds (Acres Treated)	64,403	67,727	85,554
	Extended Dry Ponds (Acres Treated)	135,772	144,168	160,881
	Wet Pond Wetland (Acres Treated)	156,282	167,848	177,773
	Infiltration (Acres Treated)	1,569	71,236	69,127
	Filtration (Acres Treated)	4,872	64,287	65,868
Septic	Septic Connections (systems)	2	8,772	42,224
	Septic Denitrification (systems)	-	105,647	82,899
	Septic Pumpouts (systems) (Annual)	14,081	76,722	79,086
Mining/ Extraction	Mine Land Reclamation	553	33,915	29,247
	Dirt and Gravel Road (Linft)	-	-	2,000
Forest	Forest Harvest BMP (Acres)	126,995	88,258	87,305
	Dirt and Gravel Road (Linft)	-	-	1,069

APPENDIX B. LOCAL AGRICULTURAL STRATEGIES

Table B.1. Local Implementation Strategies

Local Implementation Strategies for the Agricultural Source Sector	
STRATEGY	**RESOURCE NEEDS**
Animal Operations and Waste Management	
Work with livestock producers to implement waste storage management and better utilization of livestock waste.	
SWCDs will work with producers to further adopt Animal Waste Management practices.	These are very expensive practices requiring substantial planning, cost-share support, and technical assistance.
Achieve nitrogen and bacterial runoff reduction through pet waste programs.	Model credit for work done to reduce bacterial contamination in waterways (as this work also reduces nitrogen and other pollutants). Work includes pet owner-targeted education and pet waste disposal facilities.
Extend barnyard runoff control BMP to non-livestock farmsteads; SWCD would promote and work with producers toward adoption.	Substantial cost-share funds would be required to cover barnyard containment. Practice specifications and guidelines would have to be adjusted or expanded to cover broader farm situations.
Work with SWCD, NRCS, and Extension to educate farmers about mortality composting. Cost-share funds will also be important to achieve TMDL goals. In addition, composting systems that can take mortality from multiple farms needs to be evaluated.	Funding from partners for education, demonstrations, and cost-share dollars. Innovative incentives will be important to achieve this goal.
Develop a regional animal composting facility. Also incentivize horse composting.	Funding to localities for farmers.
On dairy farms, promote the further testing and use of the process of injecting liquid manure as an alternative to storing the manure and then applying it to the surface using large spreaders. There are benefits to injecting that help water quality (and would directly help reduce nitrogen and phosphorus inputs into the Chesapeake Bay).	Overall the technology likely costs a little more than the benefit to the farmer (especially during the process of getting the technology started in this area). However, if some cost-share funds are available to support this BMP, this technology might become more readily practiced.
Continue the refinement and implementation of the dairy industry's program to refine feeding practices to minimize excessive feeding of both nitrogen and phosphorus. Results of the program will be broadcast to share the successes in reducing both nitrogen and phosphorus in manure (i.e. less phosphorus in the feed equals less phosphorus in the manure). The goal is to see if it is feasible to reduce the total amount of phosphorus that cattlemen feed their livestock.	Funding to Extension to further study this.

Promote the advancement of technologies to reduce ammonia volatilization as there is currently no mention of technologies for reducing ammonia volatilization in the TMDL. These technologies reduce both direct and indirect deposition of nitrogen in the Bay.	Funding for technology development
Offer cost-share to encourage non-bird animal mortality composting.	SWCD cost-share for bird only composting be extended to all dead animals.
Develop capability for Virginia hog farmers to get BMP credit for use of swine phytase. Investigate the benefits of swine phytase. Also, educate farmers how to feed and obtain swine phytase.	Funding to research phosphorus reduction rates associated with swine phytase. State to establish accountability (through VAST or other crediting) for swine phytase feed with an associated phosphorus reduction. Also, investigate phytase distribution options for farmers and educate hog farmers about swine phytase.
Buffers and Land Retirement	
Assess current needs for forest buffers by assessing current state of streams and buffers - SWCD will work with landowners and partners to identify needs and promote buffer adoption. May need to do current assessment to see what is actually needed on the ground - many fields have appropriate tree buffers to streams.	Technical assistance and staff time needed to assess on-the-ground needs for forest buffers and related cost-share dollars to implement plantings where needed. As with wetland or any practice that takes valuable cropland out of production, a significant incentive may be required.
SWCDs will work with landowners and partners to identify pasture with buffer needs, promote adoption and design buffer systems. Minimize impact and preserve aesthetics of rural countryside by buffers and natural vegetation screening.	Technical assistance needed for development of grass buffer designs and cost-share dollars needed to fund adoption by landowners. Staff time and resources needed to assess needs and current state of buffers on hay/crop/pasture streams. May have planning and zoning requirements.
Coordinate efforts with local SWCDs to determine opportunities to reduce agricultural activities on highly erodible lands and reforest.	Funding from partners to provide additional incentives to farmers to increase participation in cost-share program.
Locality, SWCD, and DCR will work towards more efficient utilization of federal funded Conservation Reserve Enhancement Program (CREP) and State BMP program to maximize federal and state cost-share funds for this BMP.	Program modification to allow maximum utilization address resource needs.
Work with partner SWCD to increase buffers on agricultural lands near streams and rivers.	Funding from partners to provide additional incentives to farmers to increase participation in cost-share program.
Consider adopting an ordinance that would require riparian buffers and livestock exclusion fencing adjacent to waterways to protect local water resources such as perennial streams, floodplains, wetlands, and highly erodible soils.	Requires ordinance changes or other authorizing legislation.
SWCD and partners will identify pasture acres and landowners that might benefit from converting pasture to trees and work with VDOF to develop forest plans.	A significant incentive needed to affect cropland conversion; Technical assistance needed for plan development and staff time for assessment needs; cost-share funds needed to implement land preparation and tree plantings.

SWCD would identify possible areas for wetland development and work with landowners and partners to develop restoration plans	Cost-share funding needed to promote with landowners as well as technical expertise needed in the development of wetland plans. Significant incentive could be required to convert cropland to non-use (wetlands).
SWCD will work with partners and landowners to promote retirement of critical land areas that would have the most environmental benefits and be of least impact to the farm business and farming economy.	Technical assistance and staff time needed to identify and work with landowners to retire those acres most likely to bring water quality impacts. Cost-share dollars needed to convert land to new permanent use and as encouragement to landowners.
Cover Crops	
SWCD and partners would promote cover crop practice with growers and look into enhanced cost-share schemes to attract adoption.	The acreage target is higher than ever achieved so substantial cost-share dollars would be needed to reach acreage goal - approx. $2 million. May need to enhance incentives especially for harvestable small grain cover to meet goals.
Work with partner SWCD, NRCS, and DCR to identify, educate, and enroll farmers in cost-share to implement cover crops. Alternative Cover Crop Research is also needed to enhance BMP and increase participation.	Funding from partners to provide additional incentives to farmers to increase participation in cost-share program. Funding for Research and Demonstrations needed for Alternative Cover Crops.
Nutrient Management	
Work with NRCS and Extension to field test Decision Agriculture tools. This may include (1) Guided Soil and Stalk Nitrate Testing (2) Precision Soil Sampling and Fertilizer/Lime Application (3) Green seeker (and related) technologies for precision nitrogen application to corn and small grain and (4) similar technologies.	Funding from partners for education, field trials, and demonstrations needed. Innovative Incentives/tax credits will be essential to field test these technologies.
Include the "yield reserve" practice that pays an incentive to a farmer to reduce fertilizer application rates into the state cost-share program.	If incorporated into the state cost-share program, funding would need to be sufficient to reimburse farmers for yield loss - there may be other management practices which could be applied to reduce the impact of yield loss - an education and management system would need to be developed with each producer.
Advocate that soil nitrate testing be included as a creditable practice to be included in the EPA watershed model. DCR and EPA officials may suggest that soil nitrate samples are a subcomponent of Nutrient Management Plans (which are listed in the TMDL). As many farmers use this tool without having a nutrient management plan, they should get credit for these tests both in the past and in the future.	State funds allocated to fully pay the cost for collecting soil samples and laboratory cost for this soil nitrate testing practice.
Work with SWCDs and DCR to manage Nutrient Management Plans and ensure that they are followed (i.e. fertilizer application rates).	Funding for staff to assist SWCDs
SWCD would work with growers, planners, and partners to include pasture acres with other crop acres in NMPs	Cost-share funding needed to support development of nutrient management plans plus technical assistance from state staff or technical service providers (TSPs) in writing the plans

Partner SWCD will investigate opportunities to provide nutrient management plan writing services.	Funding to SWCDs for certified employees to provide NMP services.
Pasture Practices	
Work with SWCD, NRCS, and Extension to educate existing and future horse owners; community planners, and decision makers about good horse pasture management. Cost-share funds will also be important to achieve TMDL goals. Local ordinances may need to be considered.	Funding from partners for education, demonstrations, and cost-share dollars.
Work with livestock producers to exclude animals from water resources and establish vegetative buffers in high priority watersheds.	Funding for staff to provide educational programs on water quality issues to producers.
SWCD would work with livestock producers and Extension partners to adopt and develop rotational grazing/management plans	As with fence out plans, cost of fencing is a major concern and would require substantial cost-share funds to support and encourage adoption.
Work with SWCD and DCR to encourage farmers to use the cost-share program to implement rotational grazing on all land supporting grazing livestock.	
Work with SWCD, NRCS, and Extension to educate farmers about good pasture management. Cost-share funds will also be important to achieve TMDL goals.	Funding from partners for education, demonstrations, and cost-share dollars.
SWCD would work with partners and growers to include pasture acres in conservation plans for other cropland. SWCD would work with partners to include hay acres in conservation planning efforts.	Technical assistance would be needed for development of conservation plans for pasture/hay/crop lands as well as cost-share funding to carry out plans by state staff or TSPs.
Extended stream access control BMP to all types of livestock, both large and small and including horses, goats, sheep, and exotics - SWCD will work to identify and develop adoption programs with producers.	Fencing costs run $3 per foot for basic designs with more elaborate systems costing much higher. For identified quantity in WIP, cost-share would be approximately $1.5 million plus the cost of developing watering systems for livestock fenced out of surface water sources. The farmer's 25% share would be a challenge especially for smaller producers.
Work with partner SWCD, NRCS, and DCR to identify, educate, and enroll farmers in cost-share to implement Stream Access Control with Fencing.	Funding from partners to provide additional incentives to farmers to increase participation in cost-share program.
General	
Implement farm assessment programs to help farmers better manage their farming operations in a manner that is supportive of Chesapeake Bay WIP II goals and TMDL compliance.	
SWCD would identify areas needing restoration and work with landowners and partner agencies to develop restoration plans.	Cost-share dollars would be needed to fund restoration efforts as well as technical expertise in developing restoration plans. Capital intensive projects.

Continue to work with partner SWCDs, NRCS, Extension and DCR to identify and enroll farmers in cost-share and technical assistance programs to implement agricultural BMPs	Consistent federal and state funding for SWCDs to provide additional incentives to farmers to increase participation in cost-share programs. Funding for Virginia Cooperative Extension to provide technical assistance to agricultural communities regarding nutrient management and to research/field test innovative practices.
Work with partners to investigate opportunities to provide additional incentives to farmers to increase participation in cost-share program.	Funding from partners to provide additional incentives to farmers to increase participation in cost-share program. Identify funding sources to help farmers offset their portion of the matching costs.
Partner SWCD will work with local partners to provide education and technical assistance to agriculture producers that do not participate in government conservation programs.	Funding (not related to BMP cost-share) will be needed for outreach and technical assistance staff costs.
Partner SWCD will identify, collect, and report voluntarily installed BMP's.	Program guidance from DCR (after pilot program is completed) and funding for technical staff to perform program functions.
Investigate incentives to encourage private property owners to install agricultural BMP's and other quantifiable pollutant reductions measures through the existing Land Use taxation program. In addition, explore options to enhance the existing Land Use Program to include agricultural BMP's.	
Evaluate feasibility and effectiveness of retrofitting appropriate farm ponds as stormwater BMPs for credit.	Funding for pilot study and state endorsement.
When conservation easements are negotiated, incentivize Bay TMDL BMP installations. For example, provide 100% "cost-share" for BMP installations, and improve Federal and State tax incentives for BMP-laden easements.	Funding and program implementation.
Work with stakeholders to seek standards that require conservation easements to meet State/Federal agricultural standards.	
Work with SWCD, Natural Resources Conservation Service (NRCS), and Extension to educate farmers about conservation tillage. Cost-share funds will also be important to achieve TMDL goals.	Funding from partners for education, demonstrations, and cost-share dollars.
Stream cleanup efforts from nonprofits, schools, etc. should be assembled and reported for localities. (Also applies to urban stream clean-up efforts.)	Resources include staff to collect stream cleanup efforts and DCR to quantify the percent pollutant reduction associated with such BMPs.

Table B.2. Local Capacity Building Strategies

Local Capacity Building Strategies for the Agricultural Source Sector	
STRATEGY	**RESOURCE NEEDS**
Animal Operations and Waste Management	
Ensure credit in VAST for 100% poultry composting at CAFOs and in localities, AFOs to have 90% mortality composting.	DCR internally repair VAST to provide credit for BMP application in 2025 scenario.
Partner SWCD and partners will investigate inclusion of rooftop collection systems in State BMP cost-share program.	Funding for BMP cost-share.
General	
BMPs should be dually applicable in urban and rural settings based on the conditions of the site and determination of appropriate use by certified engineers, landscape architects, site planners, extension agents, etc.	
Foster greater collaboration between PDCs and SWCDs to improve coordination of urban and rural water quality and watershed implementation strategies.	
Coordinate with SWCD to track existing BMPs being used by the farming community and to identify and track additional BMPs for implementation.	
Coordinate efforts with local SWCD to determine if staffing is adequate and determine amount of cost-share needed to reach agricultural conservation practices outlined in local targets.	Establish clear goals using units of data measurement that are uniform among multiple data collection systems; for example, Bay Model report data should provide evaluation units easily comparable to DCR Agricultural BMP tracking program data.
Partner SWCD and DCR will work towards more efficient utilization of Agricultural BMP Cost-share program funds. For example, rewarding producers with additional incentives or higher cost-share rates when they address more resource concerns.	Evaluate program for possible incentives.
Encourage organic and/or hydroponic farming with assurances for adequate water quality protection.	Marketing and partnerships with Extension et al.
Promote regional Local Food Initiative to increase working agricultural lands that follow sustainable agriculture models and utilize BMPs.	Outreach and education, participation in the program by landowners.
Partner with SWCD to develop land use and BMP data on agriculture lands.	

Table B.3. Local Strategies for New BMPs

Local Strategies for New BMPs in the Agricultural Source Sector	
STRATEGY	**RESOURCE NEEDS**
Animal Operations and Waste Management	
Partner SWCD and partners will investigate inclusion of rooftop collection systems in State BMP cost-share program.	Funding for BMP cost-share.
Track large animal disposal at landfills for future reporting. While not composted, these animals are removed from the land and disposed of in the landfill.	State to work with developing uniform reporting metrics for large animal disposal not on-site. Locality has worked with regional solid waste landfill managers to obtain numbers of cows and Virginia Department of Transportation (VDOT) deer received annually; however, there is nowhere to report this on the VAST model. Resources needed to expand ability for locality to be credited for other than on-site large animal mortality disposal/composting.
Nutrient Management	
Nitrogen injection of side-dress nitrogen on corn can reduce or better utilize 10-15 pounds of nitrogen fertilizer per acre. This is being tested and promoted across eastern Virginia currently and can have substantial effect on nitrogen reduction goals.	
Educate farmers that pH and lime applications make nutrients more available. Adjusting pH results in less nutrient application required.	DCR provide funds to SWCD and/or Ag Extension offices.
General	
Work with NRCS, SWCD and Extension to educate farmers about the benefits of continuous no-till. Research, field trials, and innovative cost-share strategies needed in the areas of (1) getting a good stand in high residue situations (2) slug management in no-till and (3) alternative cover crops is needed to fully implement and (4) similar impediments to continuous no till.	Funding from partners for research, education, demonstrations, and cost-share dollars. Innovative incentives will be important to achieve this goal.
Extension and DCR to work with nursery industry to better quantify the number of nurseries in the region and their actual production practices. This will help everyone better understand if this BMP will render any water quality benefits.	Staff and time to educate local nurseries on BMPs and statewide metrics for nurseries to report to localities their fertilization use and reuse / hauls.
Work with local and state partners to develop a Purchase/Transfer of Development Rights (TDR) program.	Enabling legislation authorizing sending and receiving areas across jurisdictional boundaries. Allow localities operating TDR programs to manage development-right "banks", and fix the "broken" proffer system. Increase state assistance for PDR.

Partner SWCD and DCR to investigate a "preventive BMP" program that would assist new producers in planning agriculture production that incorporates water quality measures thus eliminating or reducing future water quality problems.	Funding for cost-share programs costs and/or technical assistance costs.

APPENDIX C. LOCAL URBAN/SUBURBAN STRATEGIES

Table C.1. Local Implementation Strategies

Local Implementation Strategies for Urban/Suburban Source Sector	
STRATEGY	**RESOURCE NEEDS**
Bioretention	
Continue to work with developers to install on-site bioretention/rain gardens.	Funds required to expand program on public lands.
Implement bioretention/rain gardens in accordance with funding availability and demonstrate effectiveness to the public.	Current stormwater program funding for water quality improvement will need to be increased 10 fold to achieve full Bay goals. State/federal partnership required.
Contact the VDOT to identify opportunities to install and maintain bio-retention filters.	
Initiate a streetscape project to include urban tree planting and retrofitting Filterra Stormwater Bioretention Filtration Systems	
Erosion and Sediment Control	
Investigate other erosion and sediment control plans that should be included as part of agreements in-lieu of plans.	
Partner with DCR, contractors, developers and others to improve efficiency of erosion control on construction sites under VSMP and local erosion and sediment control program.	Funding; training for inspectors, plan reviewers, and program administration, and increased staff time
Partner with SWCD, VDOF, NRCS and others to consider how application of conservation measures to prevent erosion losses due to land conversions can be improved.	
Impervious Surface Reduction	
Consider implementing a rain garden, cistern installation and/or downspout disconnection program for homeowner properties.	Funding from additional sources needed for site, design, installation/construction, and training to homeowners for long term maintenance. Funding also needed for program management.
Investigate developing programs that will utilize green roofs, green streets, and other similar practices on publically owned lands to demonstrate the efficiency of these practices to public and increase awareness.	Provide dedicated funding source specifically for public agencies to further offset costs of implementing such LID practices and associated educational campaigns.
Consider establishing impervious cover limits or open space requirements that preserve and restore site hydrology and implement BMPs necessary to control the discharge of pollutants in stormwater to a greater extent.	May require authorizing legislation.
Low Impact Development	

Evaluate the incorporation of “green street” design when reconstructing existing public roadways or for new roadway projects.	State and Federal grant funds, fees, reallocation of local funds.
Continue to look for opportunities to retrofit using low impact development (LID) practices on public owned parking lots	Costs and feasibility are unknown at this time
Locality Green Team (VML Platinum status) promotes "Green" activities through locality environmental policies and actions.	Continued funding of Staff time.
Investigate placing public lands under conservation easements that limit increases in impervious surface and restrict removal of trees.	
Review and amend, if needed, existing landscaping, tree canopy ordinances, parking requirements, and other ordinances requiring impervious surfaces to ensure they include BMPs that enhance the management of stormwater runoff. Review and revise codes and ordinances to include water quality performance measures using DCR's code and ordinance worksheet as required under the stormwater management regulations.	Enabling legislation that strengthens localities' abilities to implement such amendments, and provide funding to aid localities in development of such ordinances. Training for staff to appropriately administer natural resources oriented ordinances should be considered as well.
Explore options to reduce parking requirements for commercial buildings.	
Consider requiring developers to incorporate LID strategies into plans of development.	May need new ordinance to require this.
Identify financial or other types of incentives for application of low impact development and re-development.	Change to local tax and fee structure.
Develop a guidebook for LID strategies.	Technical assistance from DCR, contractor support, staff time, board approval.
Investigate the feasibility of installation of low impact development practices in karst geology.	
LID Retrofits on Residential Private property adjacent to locality streets.	Locality lacks regulatory program for incentives on private property.
Evaluate the benefits and costs of modifying existing city street design standards that require the construction of curb and gutter on all public streets. Encourage the use of vegetated swales for storm water collection and conveyance would encourage sheet flow to infiltration areas and other types of low impact design. Based on the results of the study, consider revising existing design standards to encourage the construction of infiltration-based stormwater management practices within street rights of way	Local technical resources.
Nutrient Management	
Consider working with golf courses to implement nutrient management prior to the 2017 requirement.	
Maintain no mow zones in public parks.	
Partner with SWCDs and DCR to reduce residential fertilizer use through public awareness campaign.	Funding from the state needed to implement program.

Implement an Urban Nutrient Management Education Program that initiates a pre and post assessment of landowner practices. Explore working with elected officials, stakeholders and constituents to provide incentives for implementation on private property.	Fund Ag Extension Offices to specifically implement an Urban Nutrient Management Education Program. For example, the program would work with master gardeners in a "train-the-trainer" program. Educate professional lawn-care companies, as well as individual homeowners and associations.
Continue urban nutrient management on publicly owned lands and consider impacts of state code revisions for certification and reporting.	Training.
Explore implementation of nutrient management plans on locality owned and commercial property	
Promote large scale urban nutrient management on private lands	
Continue to support the Turf Love program, assisting citizens with improved fertilizer and turf irrigation management, generating up to 250 residential urban nutrient management plans per year.	Program is dependent on available urban land for planning. FY13 annual costs = $63,750.
Pet Waste	
Collaboration between the town and local SWCD to develop a Pet Waste Reduction Program.	Costs and feasibility are unknown at this time
Participate in a focused pet waste campaign, maintain pet waste stations.	
Redevelopment	
Provide economic incentives for redevelopment (20% phosphorus reduction requirement) and elevate the priority of those that meet Chesapeake Bay TMDL Implementation goals.	Redevelopment incentives, grants.
Consider requiring all redevelopment proposals and special or conditional use permit projects involving conversions of existing land uses to include LID BMPs.	Legal authority.
The 2025 TMDL implementation deadline should be removed to allow for implementation of BMPs on existing developed lands through the normal redevelopment process. The deadline will force retrofits of existing properties to meet the 2025 timeline.	
Retrofit	
Identify potential existing dry ponds that can be converted to extended dry ponds and evaluate the costs that would be associated with this process.	Incentives
Any restoration to BMPs to improve their ability to remove sediment or nutrients should be eligible for credit as a reduction strategy (for older, pre-2006 BMPs).	EPA evaluation.
Pursue innovative stormwater retrofits on school and park properties	

Investigate opportunities to require, provide incentives for and/or fund retrofits of stormwater facilities to reduce impervious surface areas and improve pollutant removal efficiencies.	Need regulatory or eminent domain authorities to require private action. Funding from additional sources needed for design, installation/construction, and long term maintenance.
Consider how to incentivize implementation of privately funded BMP retrofits to achieve WIP baseline goals and provide cost effective nutrient trading opportunities.	Private interest and capital to implement local nutrient trading.
Work with elected officials to explore ideas and options to retrofit/install both structural and nonstructural BMP's on locality owned property.	Identification of a dedicated revenue source.
Upgrade Existing BMPs; Conduct BMP capacity and Functionality Evaluation.	Private lakes policy needs to be developed, State needs to develop unit cost for this strategy to assist in planning.
Record, inspect and possibly enforce remedial actions to make sure wet ponds are operating efficiently.	As progress continues through private development, local resource needs would be required for local staff time (or new staff position) to record, inspect and possibly enforce remedial actions to make sure the pond is operating efficiently.
Stream, Shoreline and Floodplain	
Explore ideas and options for installing energy dissipaters at urban drainage outfall locations.	Identification of a dedicated revenue source.
Promote bioretention, wet ponds, and wetlands creation near existing tidal wetlands. Dry ponds rarely function properly in coastal areas with high groundwater. Extended dry ponds are used occasionally, but tend to create mosquito breeding problems.	Technical guidance on best treatment measures for coastal areas, including information on non-water quality concerns like mosquitoes, flooding, and compatibility with residential neighborhoods.
Continue to dedicate funding for municipal Flood Assistance Program to purchase/demolish residential properties to promote floodplain reestablishment.	Funding.
Encourage the state to create a model waterfront redevelopment ordinance similar to the Open Space [cluster] development ordinance. Ordinance goal should be to encourage cost effective redevelopment that will result in reduced pollutant runoff.	
Restore existing degraded shorelines with BMP practices such as bio-engineering etc.	Funding for staff, materials, and workers. Establish volunteer program if possible.
Implement the comprehensive watershed management programs that include watershed retrofitting and stream restoration.	Reduction loads articulated in Phase I WIP for urban lands will easily exceed $500M. Locality has projected $25M through 2025 for retrofitting and stream restoration.
Consider including stream restoration and stream buffer re-establishment as a portion of projects that occur in the vicinity of streams.	
Maintain 100 foot riparian buffers on urban waterways, use stream buffer mitigation manual as a tool for evaluating proposed impacts to buffers.	

Promote shoreline stabilization	Need financial incentive to convince developers to conduct shoreline stabilization.
Continue to conduct stream bank/channel restoration/regenerative conveyance projects.	Grant funding necessary as currently no funds available.
Implement urban stream restoration in accordance with funding availability and demonstrate effectiveness to the public.	Current stormwater program funding for water quality improvement will need to be increased 10 fold to achieve full Bay goals. State/federal partnership required.
Create programs to educate the public on the benefits and values of shoreline protection. Seek and obtain state, federal, and corporate funds to support shoreline protection and enhancement efforts by hiring an experienced grant writer.	State and Federal grant funds, fees, reallocation of local funds.
Develop and implement an outreach program, to educate the public on the tidal flooding hazards and protective measures, including information on tidal flooding based on predicted tidal heights that illustrates affected streets and neighborhoods. Focus on a program warning those living in areas in which imminent flooding is anticipated just prior to the arrival of severe weather to include: evacuation procedures and a special registry for senior citizens in severe flooding areas.	State and Federal grant funds, fees, reallocation of local funds.
Implement a marketing effort to encourage and support a viable marine business environment to promote employment and other economic benefits by promoting its waterway assets, and their relationship to the economic, commercial and recreational health of the locality as well as establishing a program to encourage and improve citizens and visitor's utilization, enjoyment and satisfaction of waterways by advertising waterways and their benefits through locality and tourism brochures.	State and Federal grant funds, fees, reallocation of local funds.
Develop a comprehensive study of current and probable future tidal flooding impacts, mitigate flooding impacts and reduce potential flood damage where possible to both private and public facilities and infrastructure. Develop a long range plan to establish and maintain funding for public/private improvement to mitigate flooding impacts.	State and Federal grant funds, fees, reallocation of local funds.
Street Sweeping and Debris Removal	
Enhance the ongoing tracking of stormwater system cleaning and debris removal. Consider expanded sampling of removed material to improve the estimation of total pollutant removal from these activities.	
Investigate cost effectiveness of continuing to perform street sweeping activities and best performance measure for tracking progress	Grant or other funding for additional equipment, staffing, etc.

Develop better metrics to measure street sweeping and detailed studies to affirm the benefits of street sweeping (do all sediments get taken to the landfill? Effects of wet weather on street sweeping?)	State to develop uniform metrics for localities and agencies to report this pollutant source and to ensure collected debris is tracked to final depositional site. Resources to develop inventory of existing street sweeping and capability for expansion.
Investigate the feasibility of increasing street sweeping programs to increase frequency of streets swept	
Virginia nutrient removal credits for street sweeping activities should be applied in accordance with their guidance and allow for the mass loading approach.	EPA evaluation.
Consider how street sweeping activities can be used to enhance sediment and nutrient reductions.	Credit for each pound of material removed.
Conduct storm drain clean outs	
Manage annual leaf collection program	
Urban Tree Planting	
Explore opportunities for tree planting in underused urban areas	Public/private partnership.
Review existing landscapes or tree canopy ordinances or develop new ones to promote additional tree cover.	Staff resources needed for ordinance work and funding for trees.
Evaluate increasing tree planting requirements for newly developed and redeveloped single family homes. Requiring additional trees beyond any mitigation requirements to be planted for each unit above current standards could provide increased canopy cover and decreased pollutant generation for the locality.	State and Federal grant funds, fees, reallocation of local funds.
Participate in the Journey Through Hallowed Ground Living Legacy project where trees memorializing soldiers killed during the Civil War will be planted to increase tree canopy.	
Implement urban forest buffers in accordance with funding availability & demonstrate effectiveness to the public.	Limited to availability of funds of planting sites & cost of easements on/acquisition of private land.
Evaluate the potential to increase the number of new trees planted with ongoing construction projects and with new/redevelopment single family homes.	
Consider implementing Urban Forest Management Plans using capital improvement project funding	
Consider developing a cost-share program to encourage private properties to plant trees to convert land into forests or to provide streamside riparian buffers and establish conservation easements.	Grant or other funding for program development, training and maintenance.
Explore options to enhance landscaping requirements to allow for more tree plantings in commercial developments.	

Explore ideas and options for establishing "green partners" from both public and private sectors to encourage, promote and implement urban forestation projects.	
Consider purchasing land and converting it to forest rather than constructing certain BMPs if construction costs for a specific BMP are deemed unacceptable	Funding. Staff Analysis
Consider establishing locality buffer workshops. The program could be created to reach a large audience and include aggressive improvements by encouraging tree planting in the buffers.	
General	
Develop a tracking program to quantify voluntary and/or nontraditional BMPs. This could include tracking land use changes such as conversion of impervious area to wetlands and buffers. This would allow the quantification of improvements from a variety of sources that have a positive impact on storm water quality. This program may also consist of a tracking component to monitor continued effectiveness.	Funds for improved local tracking program.
Consider an educational pollutant control program for properties that drain to drinking water reservoirs.	Designate local funds for source water protection.
Establish local mechanisms to ensure that the recordation of urban BMP maintenance agreements becomes a routine procedure and assures transfer to future property owners.	Commonwealth comment: Recordation of BMP maintenance agreements is one of the requirements of the revised Stormwater Management Regulations that became effect in September of 2013 and which will be implemented by local governments across the state on July 1, 2014.
Encourage those developing land to install higher efficiency BMPs than required by current State regulation.	
Require a sustainable funding mechanism to support the implementation of urban practices such as pro rata fees or stormwater utility programs.	Potential funding sources may include urban cost-share programs, development proffers, etc.
Consider the development of a sustainable funding mechanism to support the implementation of urban practices to advance WIP progress.	
Inventory existing urban vacant land uses for potential infill, redevelopment, and low impact development opportunities.	Funding for assessment, inventory, mapping, and comprehensive plan updates.
Partner with the Virginia Department of Transportation (VDOT) and share data on roads and implementation strategies and requirements to advance WIP progress.	
Propose that localities work with VDOT and other entities to develop complementary stormwater management programs to support cost-effective achievement of local and State TMDL goals.	

Continue to evaluate the benefits of converting vehicles to run on CNG	Funding, DCR guidance on credit for conversion.
Take Credit for Progress BMPs (those in place since 2005)	
Consider requiring anyone submitting plans for review to document the service area of all BMPs and their annual nitrogen, phosphorus, and sediment removal rates.	Staff Analysis.
Continue, as funding allows, implementation of local Implementation Plans for Fecal Coliform TMDLs since many of the management options and proposed actions affect sources of nutrients and sediment as well as bacteria (septic system upgrades, aquatic restoration, etc).	Funding - Estimate >$3.45M.
Undertake watershed management planning. Management plans will include impervious/pervious land cover, stream corridor condition and flood plain connection, spatial location of urban BMPs and land area treated, and development of a stormwater master plan for needed upgrades, restoration, and improvements.	Cost per watershed plan = $220K times 3 currently unfunded watersheds = $660K.
Create an inventory of existing outfalls assessing conditions and outlining the need for repairs.	Technical assistance from DCR/Engineering Professionals, Funding, Enabling Authority.
Analyze the benefits of adopting stormwater management strategies that are more stringent than the minimum standards contained in the Virginia Stormwater Management Act.	State and Federal grant funds, fees, reallocation of local funds.
Increase education and outreach programs to reach a broader audience. Develop locally based programs for homeowners, business owners, and other groups that could create a positive impact on stormwater quality. Continue to sponsor the Bay Days annual event that helps to educate the over 200,000 citizens and visitors on water quality issues related to the Chesapeake Bay. Some programs are currently in place, but could be expanded to reach more citizens.	State and Federal grant funds, fees, reallocation of local funds.
Participate in Regional committees that provide information and education to citizens and employees on how to reduce impacts of stormwater pollution of the Chesapeake Bay.	Continued funding of Region/local Staff time.
Continue to promote public participation in the Chemical Collection program and provide educational materials to the public.	Continued funding of Chemical Collection Program, and staff time.
Implement urban filtering practices in accordance with funding availability and to demonstrate effectiveness to the public.	Current stormwater program funding for water quality improvement will need to be increased 10 fold to achieve full Bay goals. State/federal partnership required.
Include an Environmental Chapter in a locality comprehensive plan dealing with water quality issues.	

Explore the need for a centralized storm sewer system within designated Urban Development Areas.	Technical Assistance from DCR/Engineering, Funding.
Promote the construction of residential level BMPs on existing and future development. This could be through a combination of tax incentives and design assistance.	State and Federal grant funds, fees, reallocation of local funds.
Study the benefits and costs of redefining the extent of Intensely Developed Areas (IDAs) throughout the locality. The Bay Act allows localities to decide whether to establish IDAs or not and gives localities flexibility in the designation of areas as IDAs throughout the locality. Based on the results of this study, the locality may modify the current limits of the IDA across the locality to promote the maintenance and establishment of riparian buffer areas. The locality could also seek credit for these newly protected buffer areas similar to the way that the EPA and COE provides wetland mitigation credit for existing wetland preservation.	State and Federal grant funds, fees, reallocation of local funds.
Redefine and expand the traditional responsibility, obligation, and funding for stormwater drainage to include the sediment impact on the waterways, and initiate and implement a plan to remove stormwater sediment damage to waterways and to proactively prevent sedimentation and shoaling of the waterways as a way to optimize property values and tax revenue.	State and Federal Grant funds, fees, reallocation of local funds.
Implement an examination of the adequacy of current building standards, including finished floor freeboard requirements, to adequately address long term impacts in sea level rise as they are expected to change the frequency and duration of flooding within the locality, and review the standard every two years	State and Federal grant funds, fees, reallocation of local funds.
Promote the Virginia Clean Marina Program (VCMP). This is a voluntary program that promotes BMPs at marinas and boatyards. Through this program, the Virginia Institute of Marine Science will work with private marina owners to recommend appropriate BMPs. Through this program, additional BMPs on private lands could provide additional pollutant removal for the locality.	State and Federal grant funds, fees, reallocation of local funds.
Public Outreach and Education – continue coordination through the PDC as well as participation in local events and coordination with local environmental groups and home owners associations/civic leagues.	Local staff.

Table C.2. Local Capacity Building Strategies

Local Capacity Building Strategies for Urban/Suburban Source Sector	
STRATEGY	**RESOURCE NEEDS**
Erosion and Sediment Control	
Considering lowering compliance threshold for E&S and Stormwater Management Plans below current land disturbance area of 10,000 square feet and 1 acre respectively.	Funding for additional staffing.
Conduct E & S inspections during and immediately after a heavy precipitation, rain event. Document with photos and GPS locations for stormwater improvements and upgrades. These should be corroborated with the locality staff and correlated to the rainfall received during the documented event(s). Results should be presented to localities for potential areas to upgrade urban stormwater conditions. Stormwater upgrade areas should be prioritized as a region and efforts undertaken to seek funds for upgrades.	GPS and other equipment to document and digitize locations that are "hot spots" as potential candidates for improving stormwater issues. Resources also include funds and staff to survey, inspect, and document storm drains and gutters during several high water events in the localities. The candidate sites would need to be prioritized for future stormwater upgrades and funds disbursed to implement BMPs to renovate urban stormwater issues.
Impervious Surface Reduction	
Examine updating zoning ordinance implementing more Traditional Neighborhood Development characteristics - gives developers opportunity to plan/construct projects on higher densities on less land thereby disturbing fewer acres to create a profitable project.	
Continue to encourage relocation of pre- Bay Act impervious areas within RPA to outside limit, and to encourage less impervious area during redevelopment. Use open space ordinance to promote green spaces during new development. Development LID rules for locality officials to review.	State stormwater regulation will help; also need public education information from state, federal governments. State could sponsor training seminars on LID for locally elected officials.
Promote replacing pavement in parking spaces on private property with porous pavers or permeable pavement.	VAST does not credit pavers in C/D soils. MAST and CAST do. Modify VAST to provide credit.
Nutrient Management	
Ensure that the Chesapeake Bay Model adequately reflects results of the phosphorus ban for lawn maintenance fertilizers and that credits are assigned to localities based on the respective amount of land cover, or numbers of households, etc.	EPA evaluation.
Uniform metrics for Urban Nutrient Management Plans	State provides urban localities with protocol for carrying out and obtaining credit for Urban Nutrient Management Plans. Recommend State work in concert with Ag Extension office to develop uniform metrics and programmatic details.

The Extension office recommends starting an "Urban Nutrient Management Initiative." This would include hiring an Extension Agent with a 3-5 year focus on the "Urban Nutrient Management Initiative." A key focus would be on fertilization practices used on lawns, athletic fields, golf courses and gardens (both by homeowners and commercial applicators). The Initiative could complete both pre-and post education questionnaires to determine the amount of benefit in real numbers.	Funding for Urban Nutrient Management Planner.
Retrofits	
Study the potential locations and effectiveness of retrofitting existing raised roadway medians as depressed bio-retention areas.	State and Federal grant funds.
Perform a drainage ditch study to determine which existing ditches are functioning as BMPs capable of pollutant removal and which ditches could be upgraded to provide pollutant removal. Use the results of the study to develop future ditch improvement projects that will enhance the pollutant removal effectiveness of ditches.	State and Federal grant funds.
Investigate through SWMP adoption how urban BMP maintenance can be improved.	
Undertake study to determine potential sites for retrofits, new stormwater facilities and to weight cost to benefits	Additional staffing and operating funds.
Develop capacity to maintain and inspect stormwater facilities	Additional staffing and operating funds.
Explore possibility of taking over maintenance responsibility of most or all existing BMPs on private properties to ensure long term functionality.	Funding for program development, additional equipment, staffing etc.
Investigate opportunities to retrofit existing stormwater facilities built prior to 2006 to increase the water quality volume. Retrofits may include modifications such as adding a sediment forebay, baffles to increase hydraulic retention time, wetland bench, a series of high marsh, low marsh and pools, modifications to outlet structures, harvested wetlands or similar measures that would provide enhancement of water quality without having a negative flooding impact on the surrounding areas.	
Promote private property and public property retrofits downstream of impervious areas developed prior to the Bay Act.	In coastal communities, significant amounts of untreated impervious areas constructed prior to the Bay Act are located in or near Resource Protection Area features. In order to treat these areas, retrofits would need to be placed downstream of the imperviousness, which means that treatment must be placed within the RPA. We request that the state eliminate land cover restrictions for stormwater BMP retrofits within the RPA for the treatment of existing impervious area.
Improve Wet Pond Efficiency Through Dredging BMPs	

Develop a mechanism to monitor stormwater wet ponds in unregulated urban areas.	The money for inspection could come through site plans and proffers by builders.
Look for opportunities to retrofit existing ponds to improve water quality.	Funding.
Restore BMP Capacity and Functionality	Private lakes policy needs to be developed, State needs to develop unit cost for this strategy to assist in planning.
Stream, Shoreline and Floodplain	
Establish an ongoing and coordinated Beach Replenishment Program as well as a protection program for both public and private shorelines. Support and provide financial support for cost effectively completing these projects.	State and Federal grant funds, fees, reallocation of local funds.
Continue and seek to expand the shoreline stabilization program and evaluate the opportunities for the establishment of living shorelines instead of or in combination with shoreline hardening.	State and Federal grant funds, fees, reallocation of local funds
Consider enhanced shoreline and off-shore stabilization practices such as living shorelines and near-shore breakwaters. While this would have minimal effect within the MS4 area, shoreline and off-shore stabilization through the use of living shorelines and breakwaters could provide Bay wide benefits that could be credited to the locality.	State and Federal grant funds, fees, reallocation of local funds.
Shoreline Erosion Control, Outfall Stabilization and Improvements, and Off-Shore Stabilization - these are viable opportunities to reduce pollutants.	
Review public-owned properties for shoreline restoration and buffer enhancement opportunities.	Contingent upon identification of funding for land acquisition and implementation of high-value opportunities
Stabilize degraded outfalls and channels as part of storm sewer maintenance program.	Continued funding of Program.
Consider retiring a portion of available stream credits in a County's single-user mitigation bank.	
Promote continued coastal shoreline erosion protection/private property stream restoration through public education, using state hierarchy which promotes living shorelines.	State funding of research into new, environmentally friendly shoreline protection measures for conditions where living shorelines are not possible (narrow width project areas like canals or narrow channels where navigability cannot be restricted; high velocity wave action conditions).
Evaluate restoring buffers along locality-owned shoreline. Buffers can be restored through stabilization, reforestation and living shorelines.	State and Federal grant funds, fees, reallocation of local funds.
Establish a baseline/set of standards for the minimum acceptable condition of each waterway. Inventory and establish intended use for waterways to include baseline conditions, ownership, and maintenance issues. Implement and publish a plan that will address the schedule for restoring all waterways to their intended uses.	State and Federal grant funds, fees, reallocation of local funds.

Develop a plan to prioritize wetland restoration sites and identify restoration sites in each watershed. Evaluate the opportunities for restoration on those sites and rank the identified sites. Prepare preliminary designs for the restoration of the sites that can be used to secure grant funding or prepare estimates for future Capital Improvement Project funding requests.	State and Federal grant funds, fees, reallocation of local funds.
Identify stormwater outfalls with inadequate scour protection and develop a plan for stabilizing these outfalls to reduce the amount of sediments eroded and discharged into city waterways	State and Federal grant funds, fees, reallocation of local funds.
Encourage the federal government and states to promote off-shore, innovative BMP's like aquaculture and SAV restoration	State and federal financing of research (e.g., Virginia Tech's research into oyster aquaculture and SAV restoration); credit for innovative measures in Model. EPA should fund offshore work similar to the Great Lakes aquatic vegetation program.
As a part of the development of a waterway management function set up a citizen voluntary advisory group to assist locality staff	State and Federal grant funds, fees, reallocation of local funds.
Urban Tree Planting	
Buffer Restoration (increasing tree canopy in buffer areas).	Requires landowner cooperation, crediting of both CBPA and forest buffer in the same buffer areas.
Urban Forest Canopy inventories conducted by the VDOF need follow up with how land use managers can best implement the GIS urban tree forest canopy. Also allow localities with tree preservation ordinances since 2006 get credit for incentivizing increases in urban tree canopy cover.	Funds provided to VDOF for locality training on using Canopy Cover layer.
General	
Update Comprehensive Plan (CP) to include recommendations/encouragement of development practices to minimize land clearing, earth moving and incorporate LID features	No cost
Continue re-cycling program which reduces illicit discharges, saves landfill space, saves raw materials, and saves energy thereby reducing pollutants.	Continued funding of Program.
Consider installing enhanced stormwater quality BMPs beyond those required by state or local ordinances or other environmental improvement features on all future locality or other projects including road improvements, building renovations, parking improvements, and other construction. This could also generate points towards new facilities or existing facilities achieving Leadership in Energy and Environmental Design (LEED®) accreditation.	State and Federal grant funds, fees, reallocation of local funds.
Develop a more informed, competitive, and aggressive approach to securing grant funding to address stormwater compliance issues resulting in securing funding resources.	State and Federal grant funds, fees, reallocation of local funds.

Identify easements and develop easement language to accomplish protection of privately owned shorelines. Obtain all maintenance easements and other legal obligations as quickly as possible to remove the legal obstacles which could delay or prevent a maintenance action or other intervention when it is needed.	State and Federal grant funds, fees, reallocation of local funds.
Consider the adoption of transfer of development rights and/or purchase of development rights to promote the creation/preservation of natural areas in environmentally sensitive or flood prone areas in accordance with timeline identified in the BMP Plan.	State and Federal grant funds, fees, reallocation of local funds.
Consider developing local program elements consistent with Virginia Stormwater Management Regulations prior to 2014.	Training for current staff, additional staff, funding, Accelerate review of codes & ordinances; establish institutional structures.
Consider adopting stricter ordinances requiring the installation of BMPs in existing urban areas.	Accelerate review of codes & ordinances; establish institutional structures; funding to start the process.
Examine existing resources/capacity to implement new state requirements for local stormwater management programs, while maintaining Erosion and Sediment Control program implementation.	On going. Will need assistance of DCR in training employees. Will need funding to pay new employees to meet standard. Regional staff support.
Develop an urban BMP tracking program to support documentation of WIP progress.	Grant funds for data collection on existing BMPs; Funding for adequate program assistance and staffing of the SWCDs as they take on more proactive roles to assist localities through the WIP process.
Cooperate with regional partners to develop an urban BMP tracking program as part of a regional effort to develop GIS based data system.	Funding for software, training and position funding support.
Develop a tracking program to quantify voluntary and/or non-traditional BMPs. This could include tracking land use changes such as conversion of impervious area to wetlands and buffers. This would allow the quantification of improvements from a variety of sources that have a positive impact on the stormwater quality. This program may also consist of a tracking component to monitor continued effectiveness.	State and Federal grant funds, fees, reallocation of local funds.
Evaluate policies and ordinances and revise with water quality based language to promote practices which will achieve water quality goals.	
Examine existing resources/capacity to implement DCR's Virginia Stormwater Management Program (VSMP) and coordinate efforts with local SWCD's.	Funding will be needed for technical assistance upon establishment of the VSMP.
Coordinate with the Virginia Institute of Marine Science (VIMS) to quantify the benefits of their oyster reef restoration sites.	State and Federal grant funds, fees, reallocation of local funds.
Monitor and implement good housekeeping procedures on all Locality-owned properties, focused on reducing nutrient, bacterial and sediment runoff.	
Explore options for oyster reef creation or protection to provide a natural way to enhance water quality within waterways; consider as a BMP.	State and Federal grant funds.

Obtain detailed elevation data that can more accurately depict surface drainage patterns and thus possible drainage problem areas and solutions.	State and Federal grant funds.
Continue water monitoring programs to provide trends and identify point sources for pollution related to runoff.	Time for more complete analysis; funding.
Encourage enhanced stormwater management on development projects for Public Schools and other public facilities, which often have access to large tracts of land that may be suitable for larger BMPs, as well as the Community Development Department, which could install additional BMPs along improved streets or in residential developments.	State and Federal grant funds, fees, reallocation of local funds.
Consider implementing a drop inlet/drain marking program to educated citizens that stormwater drains to local waterways.	Funding to administer program, purchase, install and maintain markers.
Consider accessing appropriate technical expertise to identify "urban" pollution reduction opportunities (structural, non-structural, and/or programmatic in nature) and associated costs	Funding from the state and federal agencies to support assistance for this activity and for implementation of identified opportunities.
Encourage corporate stewardship through proffers and other incentives; encourage corporate stewardship on public lands	Interagency cooperation (VDGIF) public/private partnership.
Consider offering homeowner education programs that address local water quality issues.	Public private partnership.
Enhance dialogue with towns about activities or policies or opportunities to achieve TMDL.	Staff to facilitate communications between localities to assist in future TMDL progress reporting
Consider correcting identified pollution prevention situations and enhancing pollution prevention through employee training, materials storage, and spill response.	Public/Private Partnership.
Develop better coordination of Chesapeake Bay stormwater planning regulations with E&S requirements by adopting a local ordinance that combines the requirements to ensure land disturbing activities are managed effectively and efficiently.	
Participate in state's Stormwater Management ePermitting System as a way to track actions.	State's timely development of the Virginia ePermitting System. Early information on website-requested data tracking information can begin now.
DCR and EPA provide a mechanism to credit reduction practices implemented outside of the MS4 service area towards meeting the MS4 waste load allocation (as identified in the DCR Chesapeake Bay TMDL Phase II WIP FAQ) as well as similar TMDL credits for rural reduction practices implemented outside areas locally-protected under the Bay Act.	Load reduction credit guidance.

Lessen gap between the broader program requirements that apply in MS4 urban communities and the environmental programs that can be undertaken under the revised stormwater management regulations.	State authority to expand stormwater management to all areas of the locality, not just those included in designated RMAs and RPAs.
Develop capacity to design and construct stormwater facilities.	Additional staffing and operating/capital funds.
Develop an assessment of BMPs that provide nutrient removal and flood control.	
Consider establishing stormwater utility fees, service districts, or pro-rate fee programs to address sediment and nutrient loads associated with stormwater runoff.	Local ordinance change.
Refine watershed inventories to include impervious/pervious land cover, stream corridor condition, identification of healthy watersheds, spatial location of urban BMPs and land area treated.	Fund through existing stormwater program and additional funds may be needed.
Explore options to approve, codify and implement a DCR approved storm water management program.	State grants for capacity building activities.
Inventory and field locate, with GIS technology all BMP's post January 1, 2006 to current. Analyze drainage areas and monitor for progress.	State grants for capacity building activities.
Use study by the Environmental Finance Center at University of Maryland to identify efficient stormwater financing alternatives.	
Air Deposition - reduction in pollutant loads by elimination or closure of sources and implementation of cleaner technologies such as CNG, hybrid, or other alternative fuel technologies	
Conversion of garbage fleet to compressed natural gas. This will achieve a 30-50% reduction in NOx emissions over the current diesel powered fleet. 90% of the fleet will be converted by 2017 if current purchasing plan of 17 trucks in 2012 and 6 trucks per year thereafter is followed.	Continued locality funding for fleet replacement and state guidance on how to estimate pollutant reductions and count this as a water quality BMP.
Develop/refine/maintain an urban BMP tracking program including uniform BMP tracking system for MS4s.	GIS, staffing
Maintain locally established zoning requirements for infill development. In order to obtain a special use permit allow increased density as an approved LID strategy.	
Evaluate the program resources needed to effectively implement a comprehensive qualifying local Virginia Stormwater Management Program, including a local Erosion and Sediment Control and Stormwater Management Program as described in the revised Stormwater Management Regulations.	Provide funding for necessary staffing to implement this recommendation, in addition to existing fee structure.
Investigate the adoption of DCR's Better Site Design Manual to mitigate the impact of stormwater runoff from developed lands.	DCR should provide training on its Better Site Design Manual; grant funding needed for program development by localities.

Wastewater reuse and land application technology educational efforts. Both of these technologies are proven. Recommend Ag Extension review successful technologies where these have been implemented and propose for future BMP consideration and determination of best application (receiving land size and application ratio needs to be optimized and explained to land owners.)	Funding to research these technologies and then for an educational campaign through the Ag Extension office to outreach land owners and explain how to best apply these BMPs.
Provide an opportunity for localities to have dialogue with state and federal agencies located within their borders to optimize BMP placement for maximum benefit in water quality improvements.	Increased timeframe and staff for localities to develop rapport with and hold periodic meetings with State and Federal agencies with facilities within their boundaries. Also, the State to develop uniform reporting metrics for the agencies to report their BMPs annually (federal forested acres by County, VDOT, acres of town roads swept annually, etc.).
Conduct a rate study to revise storm water fees based on updated impervious area information and cost of providing storm water collection, conveyance and treatment. Based on the results of the rate study, seek rate changes through an amendment to the locality storm water ordinance.	Local funds.
Expand street sweeping into newly developed neighborhoods and streets as they are accepted into the locality's street inventory for maintenance	Funds to implement most cost effective practices.
Communicate with DCR to address issues with allowing use of infiltration practices in karst areas to increase pollutant removal efficiencies	
Support the rain garden retrofit program to provide technical assistance to citizens for the installation of residential scale rain gardens on private property.	Program is dependent on sufficient number of Master Gardener volunteers and available urban land for planning. FY13 annual costs = $37,530.
Utilize DMME karst mapping for identification of vulnerable areas in future ordinances and comprehensive Planning efforts.	Funding for education of individuals to become familiar with the karst map to promote sound land use practices in karst and other water quality sensitive areas.
Consider developing incentives or ordinances for limitation of managed turf and the preservation of native vegetation and open space.	Funding for program development.
Sanitary Sewer Overflow Elimination and Reduction.	

Table C.3. Local Strategies for New BMPs

Local Strategies for New BMPs in the Urban/Suburban Source Sector	
STRATEGY	**RESOURCE NEEDS**
Erosion and Sediment Control	
Consider expanding the list of E&S control measures explicitly referenced in the form contract used for agreements in lieu of a plan.	Staff time and board approval, contractor support, update measures on form.

Ensure that all plan reviewers, inspectors, and program administrators obtain the appropriate certifications as required under the Erosion and Sediment Control and Stormwater Laws.	More statewide training.
Low Impact Development	
Require new commercial buildings to provide green roofs and or cisterns.	City ordinance/changes to state regulations.
Create an Urban Development Area (UDA) to accommodate anticipated residential, commercial, and growth period of at least 10 but no more than 20-years. Concentrate future development into growth areas. Ensure "Critical Environmental Areas" marked on the Green Infrastructure Network lie outside the Future Land Use Growth Areas.	Education, staff time.
The State should revise the building code to support the use of cisterns and the Health Department should evaluate the advantages of allowing stormwater reuse within residential buildings. The state should also promote and fund the use of harvested rainwater or stormwater reuse instead of potable water consumption for industrial and manufacturing processes.	The Virginia Health Department should evaluate the advantages of allowing stormwater reuse within residential, commercial and industrial buildings.
Consider lowering minimum parking space requirements for professional office space and retail buildings, implement a maximum and require mitigation when exceeded.	Education, staff time and board approval, amend zoning ordinance.
Consider increasing landscaping requirements in new parking lots and require the landscaped areas be designed to collect and filter runoff.	Education, staff time and board approval, amend zoning ordinance.
Consider explicitly allowing perforated cuts along roadsides in the designated growth areas, public guidance documents with acceptable designs.	Education, staff time and board approval, amend subdivision ordinance.
Explicitly allow landscaped islands in the middle of cul de sacs, publish guidance on how that can be outfitted with LID.	Education, staff time and board approval, amend subdivision ordinance.
Promote conservation/cluster development to protect sites sensitive natural resources for residential development in rural areas	Staff time and board approval, contractor support, education.
Consider requiring a hydrological study for developments of 10 or more homes.	Staff time and board approval, contractor support.
Discourage excessive changes to the existing topography or tree cover, particularly outside designated growth areas.	Staff time and board approval, contractor support, education.
Require that 20% of spaces within larger parking lots be designed to “compact car” dimensions (8’ X 16’).	Amend zoning ordinance.
Nutrient Management	
Golf Course Nutrient Management Plans and other water quality BMPs should be encouraged.	Model needs to capture all golf courses and estimate nutrient loads. Resources needed include golf course model nutrient management plans, education of such plans, and incentives to implement such. Staff needs to tabulate those golf courses with water quality improvement BMPs or nutrient management plans.

Pet Waste	
Reducing the amount of pet waste reaching the stormwater system has been a long-term objective. Education programs that reduce pet waste as a source of nutrients should be an approved nutrient management strategy.	Localities could document the effectiveness of local educational campaigns by surveying public participation and understanding of its messages or reporting the number of pet waste disposal bags distributed (for example).
Inventory which localities may have a pet waste ordinance and encourage other localities to adopt the same. Provide a model ordinance for pet waste. Develop a tracking method to provide credit for localities with these ordinances to reduce nutrients.	Staff to develop model ordinance and assistance with localities to consider such a pet waste ordinance for adoption.
Retrofit	
State should consider support and advocating for flexibility in retrofit crediting.	CBP evaluation/state support.
Continue, as funding allows, implementation of the retrofits and stream restorations identified in the stormwater master plans contained in approved watershed management plans.	FY08-FY12 expenditures to date > $5.5 M. FY13-14 5-year CIP request = $10.5M (also includes funding for known needs in unplanned watersheds).
Consider using manufactured BMPs in heavily urbanized areas that have limited space for retrofits.	State and EPA approval of manufactured treatment measures; credit in the Chesapeake Bay Model.
Stream, Shoreline and Floodplain	
Examine the recent Virginia Code revision requiring adoption of living shoreline management plan element of local comprehensive plan. There may be merit in applying such shoreline protection strategy to all shorelines and streams as a recommended practice.	
Include efficiencies of different types of shoreline stabilization practices, particularly living shorelines.	EPA evaluation.
Urban Shoreline Restoration.	Development of an Urban Shoreline Restoration BMP.
Urban Shoreline restoration with Living Shoreline	Credit for marsh as well as shoreline stabilization.
Investigate urban stream restoration on publicly-owned lands, upstream of tidally-influenced or tidal waters, and outside of the Resource Protection Area. Focus on long runs of drainage conveyance ditching located off road, like the upper reach of ditch. If conveyance structure is too flat for proper stream restoration, consider periodic widening of the length of ditching to provide a series of extended detention areas.	Technical guidance on providing stream restoration in flat, low-lying areas when existing streams have negligible slopes, and where flooding is a major concern and ongoing threat to public health and property.
Investigate urban stream restoration on publicly-owned lands, including tidal streams	Work in RPAs or tidal streams is limited by RPA land use restrictions and cumbersome state/federal permit application procedures and requirements. State-led coordination with Joint Permit Application regulatory agencies (Army Corps of Engineer, VMRC, DEQ, and DCR) for living shorelines is a good first step, but needs to be expanded to other retrofits and work within the RPA.

Encourage stream bank stabilizations and stream restorations on private property; investigate stream bank stabilization and stream restorations on public property	As almost every ditch/stream is tidal, we request the state work with the Army Corps of Engineers and state agencies including VMRC, DCR and DEQ to streamline the permit process for work that will improve water quality. This needs to occur for living shorelines, hybrid stream bank stabilization, structural stabilization in those areas where hybrids/living shorelines are not technically feasible, and for urban stream restoration projects.
Study the benefits of revising the Tree Preservation Ordinance to be in alignment with the Maryland ordinance credited with pollutant removal efficiencies by the EPA in the Bay TMDL. More information is needed on the credit given Maryland for its ordinance Authority may be required from the General Assembly to bring the locality ordinance into conformity with the ordinance in Maryland.	Funds at all levels of government needed.
Explore adopting a canopy requirement and related incentives to preserve existing trees on new development sites. Explore adopting a tree conservation ordinance and designate specific trees for protection.	Education. Staff time and Board approval. Adopt a canopy requirement.
Study the use of harvested wetlands in existing stormwater bump outs to increase nutrient removal efficiencies	Funding, DCR guidance on efficiencies of harvested wetlands.
Per Center for Watershed Protection, wet ponds are conducive to coastal environments. Likely to continue to see more wet ponds proposed by developers. Encourage regulators to recognize the need for wet ponds in areas where infiltration-based practices are limited by high groundwater and poorly drained soils. Encourage state to provide guidance on maintaining wet ponds, and to provide research funding for better wet ponds. Encourage state to address the issue of RPA creation on adjacent properties by tidally-connected treatment measures.	Develop more guidance and state disposal options for silt created by mucking out wet ponds. Tidally connected ponds/created wetlands falling under U.S. Army Corps of Engineers jurisdiction lead to creation of new RPAs, which can unfairly limit land use on adjacent properties. Limit RPA creation by manmade structures constructed to improve Bay water quality.
Investigate locations where existing wetlands can be augmented by creating more wetlands.	Creating tidally-connected wetlands can unfairly impact adjacent property owners by creating new resource protection areas with land use restrictions. Request state exempt created wetlands and other treatment practices from the list of RPA features.
Create wetland and natural area restoration projects that provide multiple benefits such as flood control and flood protection, compliance with state and federal environmental regulations, improved passive recreation opportunities and enhanced quality of life for residents	State and Federal grant funds, fees, reallocation of local funds.
Street Sweeping and Debris Removal	
Storm Sewer and Catch basin Cleaning (sediment removal).	Future tracking of weight of debris removed; count as alternative BMP like Maryland
Continue to track sediment removal of maintenance activities (i.e. ditch cleaning, catch basin cleaning, pipe cleaning, yard waste pickup).	State and federal support to include this activity as a recognized BMP.

CBP should evaluate nutrient removal associated with trash removal, yard waste collection and leaf recycling.	CBP evaluation.
Localities should be credited with nutrient reductions by quantifying reductions in pesticide application on public lands or by documenting the effectiveness of public outreach campaigns to minimize pesticide usage.	Funds to track pesticide sales.
Urban Tree Planting	
In support of the residential and urban forest programs, seek to offer incentives for private BMP upgrades and installation, including incentives to defray the cost of upgrading privately owned BMPs, install rain gardens, encourage downspout disconnections, encourage tree and other native species planting, and provide free pet waste collection systems for neighborhoods.	Program is dependent on adequate funding - FY12 funding = approximately $50,000.
Encourage local organizations to develop residential BMPs and buffer restoration projects. Partner with local groups to help establish a loan or incentive program for residential water quality improvements including nutrient management planning on residential properties.	State and Federal grant funds.
The CBP should approve its own Forestry workgroup's proposal to allow urban tree planting to be modeled as "planting 100 trees is equivalent to converting one acre of urban pervious land to forest". Moreover, the EPA should examine the merits of expanding the enabling authority under § 15.2-961.1 to extend to improving water quality as well as the existing air quality context.	CBP evaluation.
General	
Infiltration is severely limited in coastal areas. Encourage regulators to develop more BMPs that are technically feasible in areas of high groundwater and poorly draining soils.	Per state and federal guidance, infiltration is not technically warranted in areas of high groundwater/poorly draining soils. Yet practices relying on infiltration are often promoted. More recognition of coastal area treatment limitations would be welcomed. More research into coastal area-conducive innovative treatment measures and offshore practices is needed. Please consider coastal area hydrogeologic conditions when developing treatment prioritizations.
Consider initiating a Mountain Protection Plan process.	
Consider ways to improve open space requirements to decrease pervious surfaces.	Education. Staff time and Board approval.
Discourage road construction on slopes of 15% or greater. Permitted roads should follow the natural topography and minimize grading, cutting, and filling as much as possible.	Staff time and board approval, contractor support, education.
Identify and fund projects to increase its water quality BMP inventory	Funding.
Continue to fund, design, construct two (2) regional Water quality basins within municipal boundaries	Funding.

Encourage local organizations to develop residential BMPs and buffer restorations. Partner with local groups to help establish a loan or incentive program for residential water quality improvements including nutrient management planning on residential properties.	Funds needed at all levels of government.
Investigate development of a more straightforward commercial storm water credit program. A consistent storm water credit program based on reduction of impervious area or efficiencies of installed BMP retrofits would incentivize private property owners to provide direct water quality improvements on site.	Funds needed at all levels of government.
Identify and prioritize public employee training needs and attend educational sessions focused on reducing nutrient and sediment runoff resulting from municipal activities.	State-generated informational brochures and training sessions. Please provide training sessions in regional, rather than statewide settings. Stormwater toolbox program at VA Environment conference is appreciated, but requires travel and conference registration. Suggest state hold training in low cost, local settings.
Evaluate the possibility of changing the stormwater facility acceptance practices to separate it from roadway acceptance.	
Utilize proffer guidelines to promote stormwater management enhanced techniques, especially to meet redevelopment goals.	Proffer development. Staff time. Contractor support.
Investigate using previously purchased lands as nutrient credit banks to help meet TMDL requirements.	Program adoption by the State, and locality action to obligate lands to this purpose.
Localities should be allowed to take credit for programs that reduce air emissions that are the source of nitrogen loads on urban lands.	EPA evaluation
Continue developing and maintaining illicit discharge detection and elimination program.	State participation in funding for inspection and testing of illicit discharges.
Establish a preventive maintenance and monitoring program using a formal hydrographic survey and study program; Create a “best practices” approach resulting in an ongoing understanding of sediment/shoaling rates, economic values, revenues, etc. resulting in the most efficient maintenance program.	State and Federal grant funds, fees, reallocation of local funds.
Improve relations with the VDEQ and the Virginia Department of Health (VDH) to jointly investigate and eliminate illicit discharges. Many sources of direct discharge to state waters are regulated by VDEQ. Work more closely with VDEQ to identify and eliminate these sources of direct discharge	State and Federal grant funds, fees, reallocation of local funds.
Efforts Directed Toward Pathogenic Reduction - Practices that have the ability to reduce pathogens and nutrients/sediment will be given a priority over those that are exclusive to one type of reduction or the other	Direct funds to implementation efforts with greatest overall benefit.

Evaluate the feasibility of using the Virginia Department of Transportation Comprehensive Roadside Management program (24 VAC 30-121) as a way to promote small roadside BMPs. Working with a community partner, small BMPs could be installed on existing roadways, with new roadway projects, or at the entrances to neighborhoods or business parks at no cost to the locality through perpetual donations from private citizens and businesses.	State and Federal grant funds, fees, reallocation of local funds.
Seek opportunities to partner with private vendors of innovative stormwater technologies to evaluate their effectiveness and operational efficiency at reduced or no cost to the locality.	State and Federal grant funds, fees, reallocation of local funds.
Develop, implement, and fund a BMP Plan to meet the Phase II Watershed Implementation Plan consistent with Chesapeake Bay TMDL 2 year milestone requirements	State and Federal grant funds, fees, reallocation of local funds.
Explore the possibilities for the construction of stand-alone BMPs to treat currently untreated stormwater runoff prior to its discharge into surrounding waterways. Evaluate the opportunities for BMP construction as detailed in watershed master plans and seek funding in future Capital Improvement Plans for the construction of new BMPs	State and Federal grant funds, fees, reallocation of local funds.
Promote and/or establish citizen advocacy groups, grassroots lobbying groups and institutional organizations to address issues of quality and quantity of stormwater, become involved in emergency response programs and seek grant funding from non-governmental organizations (NGOs), land conservancy tax credits, site sponsorships, and commercial marketing to implement the shoreline management program.	State and Federal grant funds, fees, reallocation of local funds.
Support the use of small projects such as oyster reef restoration/construction, rain garden construction and rain barrel use to improve water quality	Funding.
Investigate the updating of the commercial stormwater credit program. The stormwater credit program would include incentivizing private property owners to provide TMDL-based direct water quality improvements on site.	Reallocation of local funds.

APPENDIX D. LOCAL ONSITE WASTEWATER STRATEGIES

Table D.1. Local Implementation Strategies

Local Implementation Strategies for the Onsite Wastewater Source Sector	
STRATEGY	**RESOURCE NEEDS**
Rely on Virginia Department of Health to continue to administer existing programs to ensure onsite sewage disposal systems function as intended, and to expand programs as necessary to meet any load reduction goal shortfalls associated with septic systems.	
Develop a cost-share for repairing failing septic systems and voluntary practice of improving existing septic systems.	Additional staff and funds for VDH to pass through to landowners.
Work with VDH to identify the denitrification of various septic systems other than MicroFast.	State to develop industry standards for denitrification systems. Additional staff and funds to work with VDH for additional certification of denitrifying of AOSS (Alternative onsite septic systems). Also funds to educate developers of use of denitrifying AOSS.
Work with partners to investigate opportunities to provide additional incentives to landowners to increase participation in cost-share program.	Funding from partners to provide additional incentives to landowners to increase participation in cost-share program.
Capture VDH well and septic permit information as part of site plan review; capture and report the number of pump outs and connections from VDH.	VDH state and regional offices need funding, staff time.
Limit the use of certain kinds of septic systems on slopes of 25% or greater to the extent allowable by state law.	Research local authority and examples of ordinances, staff time, consultant support.
Consider providing opportunities for homeowners with septic systems to connect to the sanitary sewer system at a reduced cost to the homeowners.	Funding from federal, state and local partners to provide additional incentives to homeowners to increase participation in programs, funding also needed for program administration; tax credits.
Ensure the number of annual septic connections is available.	Resources needed to ensure septic connections to municipal; maintain tracking and reporting of such conversions.
Identify residences within the locality where septic systems with inadequate water/wastewater systems are found. Provide centralized systems to meet the need for water and wastewater services in the locality.	Funding for both design and construction of systems.
Consider revising existing locality ordinances to require owners of septic systems to connect to the municipal wastewater system if available with the goal of eliminating failing septic systems that cannot be upgraded to modern standards.	Funds at all levels of government needed.

Partner with the Virginia Department of Health to track new or upgraded septic systems that decrease nitrogen.	
Continue with septic pump-out notifications to homeowners and follow-up with non-respondents.	Continue to fund mailings.
Continue current septic pumping program, including record updating for new construction, yearly notifications, and grant acquisition.	Continued grant funding for pump-out assistance and funding for NGOs supporting local governments for failed septic system replacement.
Explore implementation of locality-wide mandatory septic system pump out every 5 years, to include tracking, inspections, pump outs, and GPS location of septic systems.	

Table D.2. Local Capacity Building Strategies

Local Capacity Building Strategies for the Onsite Wastewater Source Sector	
STRATEGY	**RESOURCE NEEDS**
Encourage and/or require VDH participation in local planning exercises.	VDH state and regional office support for localities.
Credit for Consent Order work in the TMDL program. Request the state provide some relief for citizens from the combined impact of increased sewer and stormwater costs resulting from these two major environmental programs being implemented simultaneously. This relief could take the form of extended time in which to accomplish goals, staggering the time in which these actions occur so that one program would begin when the other program was completed, state financing of some of the work, or some combination of these options.	
Consent Order work. Model credit should be provided for this work, as Consent order work is not being universally performed throughout the watershed, and work is resulting in cleaner waters.	Locality has inspected its entire sewer system, and will spend millions of dollars to rehabilitate a system that is mostly less than 15 years old.
Continue the installation of sewer systems and disconnecting septic systems to further reduce the nitrogen load.	Local funds.
Consider developing educational programs to inform residents of the benefits of retrofitting existing alternative on-site sewage systems with a certified treatment technology to achieve a reduction of total nitrogen output.	State and local funding.
Seek legislative changes necessary to establish tax credits for upgrading/replacing conventional septic systems with nitrogen reducing systems.	Tax credits.

Provide accurate count of septic tanks/sewer connections by VAST no later than 2017. Continue to promote/require sewer connections so that there are less than 25 septic tanks in locality by 2025	Commonwealth of Virginia to continue to take the lead in regulating septic tank pump outs, retrofits, and replacements. Regional Authority to continue to provide capacity for new development.
Establish internal procedures between the Health Department and the Public Works, Stormwater Division to track septic system inspection, pump out, installation and removal across the locality.	

Table D.3. Local Strategies for New BMPs

Local Strategies for New BMPs in the Onsite Wastewater Source Sector	
STRATEGY	**RESOURCE NEEDS**
Investigate methods of ensuring that both centralized and decentralized sewage systems and other utility infrastructure are in compliance with laws.	Enabling Authority, Interagency Cooperation (with DEQ.)
Investigate opportunities to develop a program to expand septic system pump out requirements to areas beyond the Bay Act.	Enabling legislation from general assembly.
Work with localities to consider adoption of an ordinance that requires routine septic pump outs (every 4 years for a family of 4) and offer BMP credit for such.	Funding or staff to educate localities that ordinances exist and DCR provide model ordinance to localities for their consideration.
Require the submittal to the Department of Health proof of septic system pump out or conversion from each active septic system once every 5 years or a letter certified by a sewage handler permitted by the Virginia Department of Health that the septic system has been inspected, is functioning properly, and does not need to have the tank pumped out once every five years.	Funds at all levels of government needed.
Work with Dept of Health and partners to evaluate establishing an incentive program to landowners who pump their septic tanks, or an incentive to the septic hauler which will promote increased maintenance of septic systems.	Capacity at WWTP to process hauled waste.

APPENDIX E. LOCAL FOREST LANDS STRATEGIES

Table E.1. Local Implementation Strategies

Local Implementation Strategies for the Forest Lands Source Sector	
STRATEGY	**RESOURCE NEEDS**

Table E.2. Local Capacity Building Strategies

Local Capacity Building Strategies for the Forest Lands Source Sector	
STRATEGY	**RESOURCE NEEDS**

Table E.3. Local Strategies for New BMPs

Local Strategies for New BMPs in the Forest Lands Source Sector	
STRATEGY	**RESOURCE NEEDS**
Investigate methods to preserve forest buffers on streams with conservation easements, voluntary proffers, and zoning code restrictions.	Funding and staff time.
Funds needed for portable bridges to be used during timber harvesting to reduce impacts to waterways. (There used to be a portable bridge incentive fund issued through the VDOF for loggers, it needs to be reestablished.) Recognize their value in the model.	Funds provided to VDOF for harvesting activities.
Promote the use of wood mats and gravel for the protection of roadways during logging activities to reduce erosion and sediment in streams and onto roadways.	
Education and outreach with private harvesters for preharvest planning with VDOF in advance of timbering to get input on BMPS. VDOF to consult and advise loggers in advance will result in reduced impacts.	Funds provided to VDOF for harvesting activities.

APPENDIX F. LOCAL RESOURCE EXTRACTION STRATEGIES

Table F.1. Local Implementation Strategies

Local Implementation Strategies for the Resource Extraction Source Sector	
STRATEGY	**RESOURCE NEEDS**

Table F.2. Local Capacity Building Strategies

Local Capacity Building Strategies for the Resource Extraction Source Sector	
STRATEGY	**RESOURCE NEEDS**

Table F.3. Local Strategies for New BMPs

Local Strategies for New BMPs in the Resource Extraction Source Sector	
STRATEGY	**RESOURCE NEEDS**
Continue to prohibit disturbance of lands on 30% slopes unless approved by the Planning Commission.	Continued funding of Staff time.
Eliminate surface mining land use confusion between “permitted acres” and “disturbed acres”. Undisturbed acres on a permit should reflect the inputs that would come from whatever land cover is there, whether forest or pasture or fallow land, not the high inputs that have been assigned to surface mine lands. Maybe have three land uses associated with mining: disturbed, undisturbed, and reclaimed.	DCR to work with DMME on land use classifications for surface extraction sites.

APPENDIX G. IMPLEMENTATION SCHEDULE

Table G.1 below contains timelines for the implementation of many of the programs discussed in the WIP document.

Table G.1. Implementation Schedule

Action	2012				2013				2014			
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Development of local stormwater mangement programs consitent with Va. Stormwater Management Regulations												
Submittal of draft template MS4 permit to EPA												
Begin permit process for 11 Phase I (large) MS4s												
Resource Managemet Plan regulations												
Development of nutrient trading regulations												
Revised fertilizer application rates based on Slow Relase Fertilizer Study fast-track regulations												
Ban on phosphorous in retail lawn fertilizer												
Development of 2014/2015 Milestones												
Construction general permit												
Phase II (Small) MS4 general permit												

APPENDIX H. AGENCY CONTACT INFORMATION

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