Chesapeake Bay TMDL Phase II Watershed Implementation Plan (WIP II)

Executive Summary

On October 5, 2011, and further clarified on November 9, 2011 (Attachment 1), the Virginia Department of Conservation and Recreation (DCR) requested information from all localities in Virginia's Chesapeake Bay watershed to help develop the Phase II Watershed Implementation Plan (WIP II) for the Chesapeake Bay Total Maximum Daily Load (TMDL) for the Commonwealth of Virginia.

The Bay TMDL, sometimes referred to as a "pollution diet," establishes limits for the amount of nutrients and sediment allowed to flow into the Bay in order to restore water quality to support aquatic life. The TMDL will be realized through the development and execution of Watershed Implementation Plans (WIP) in the six Bay-states and Washington, D.C., that include pollution limits for point sources (permitted sources such as wastewater treatment plants and urban stormwater systems) and non-point sources (diffuse, non-permitted sources such as agricultural lands and suburban stormwater).

Virginia is preparing WIP II for submission to U.S. Environmental Protection Agency (EPA) on March 30, 2012, and requested the following information and data from local governments:

1. Current local land use data.
2. Current level of best management practices (BMP) for agriculture, urban, and other sectors in each locality.
3. Description of how BMPs will be implemented by 2025 to meet "target goals."
4. Strategies needed to meet 2025 target implementation goals.
5. Resources needed to meet 2025 implementation goals.

DCR will aggregate the local data and strategies submitted to verify, through the Chesapeake Bay Model, that Virginia will succeed at achieving the pollution reduction goals as set forth in the Phase I Watershed Implementation Plan submitted to EPA in December 2010. If information is not provided by a locality, then the Bay Model's default data will be used. (The default data is output from the Chesapeake Bay Model based on the 64,000 square mile watershed, which is generally *inaccurate* at a much smaller scale such as a county or city.)

Both EPA and DCR have stated that data will not be used to develop specific load reductions for each locality (with the exception of highly urbanized cities and counties that have special permits), and EPA does not currently have authority to do so.

This information request is an opportunity for local governments to provide information that will improve the accuracy of the Chesapeake Bay Model at the local scale. The information being requested also allows local governments the opportunity to identify and assess strategies and resource gaps for implementing practices that will result in water quality improvements at the local scale as well as in the Chesapeake Bay, as required by federal regulatory requirements. These cleanup activities will be costly and require increased resources at the state and local level. (The Senate Finance Committee

report of November 2011 states that the cost to the state will be in the billions. See Attachment 2.)

Since October 2011, Rivanna River Basin Commission (RRBC) and Thomas Jefferson Planning District Commission (TJPDC), along with the Culpeper and Thomas Jefferson Soil and Water Conservation Districts (SWCD), helped local governments in PD-10 compile and submit the requested information, to evaluate strategies that are being or could be employed by the County, and to identify the resources that will be necessary to meet water quality goals.

RRBC provided direct support to Fluvanna and Greene County staff in preparing and electronically submitting the information (through a program called VAST, the Virginia Assessment Scenario Tool) by February 1, 2012, and also assist by providing contextual language the counties could use to convey that the information is *preliminary in nature* and *does not commit the County to specific activities*, but affirms the County's present and ongoing participation in the process. RRBC also advised and provided input to Albemarle County and Charlottesville staff during the preparation of their responses and to Albemarle County to assist in submission using the VAST tool.

Chesapeake Bay Cleanup Plan (Bay TMDL) – The History

Since a 1987 Chesapeake Bay Agreement, EPA, the District of Columbia and the six states in the Chesapeake Bay watershed (Bay) have implemented various programs to improve the health of the Chesapeake Bay so that it meets the requirements of the Clean Water Act (CWA). The primary issue with the Bay has been excessive algae growth and poor water clarity resulting from excessive amounts of nutrients (nitrogen and phosphorous) and sediment washing into the Bay due to various activities and land uses, including agricultural and forestry activities; stormwater runoff and septic tank leachate associated with land development; industrial and wastewater discharges; and atmospheric deposition from within and outside the watershed. These pollutants leads to low levels of dissolved oxygen and poor water clarity that, in turn, diminishes conditions for healthy aquatic life.

Despite significant progress over the past two decades, the Bay remains significantly impaired and failed to meet a 2010 deadline for pollutant reductions stipulated in the 2000 Chesapeake Bay Agreement. In addition, the EPA reached settlement in a 2009 lawsuit filed by Bay advocacy groups – including the Chesapeake Bay Foundation – claiming that the EPA failed to take adequate measures to protect and restore the Bay. As part of the settlement and due to the failure of earlier, voluntary restoration programs, EPA was required to establish a TMDL for the Bay. To focus attention and resources on the Bay, President Obama issued an Executive Order in 2009, which has been followed by an Action Plan that is being updated yearly and describes actions across all federal agencies to restore the Bay to health.

The Bay TMDL, sometimes referred to as a "pollution diet," establishes limits for the amount of nutrients and sediment allowed to flow into the Bay in order to restore water quality to support aquatic life. The TMDL will be realized through the development and execution of Watershed Implementation Plans (WIP) in the six Bay-states and Washington, D.C., that include pollution limits for point sources (permitted sources such as wastewater treatment plants and urban stormwater systems) and non-point sources (diffuse, non-permitted sources such as agricultural lands and suburban stormwater).

The overall process includes two-year implementation milestones through the year 2025 and will be strictly enforced by the EPA.

The Bay TMDL issued December 2010 describes the pollution reductions required of each source and within each major tributary of the Bay to achieve a Chesapeake Bay that is healthy and supports the fisheries and recreational uses that are so important to the region. The Phase II WIP for Virginia is part of the Bay TMDL document and describes in more detail how Virginia will achieve the required reductions by implementing agricultural, forestry, and mining BMPs, septic improvements, waste treatment plant upgrades, and stormwater management improvements. Among other strategies, Virginia plans to expand the use of nutrient credit trading to help achieve reduction goals. A number of pieces of legislation in the current session relate to implementing the Bay TMDL both at the state and local government levels. However, most of the necessary actions will need to be taken by local governments under existing or expanded statutory authority.

It is important to note that EPA has statutory authority only with respect to those activities it permits: waste water treatment plants, MS4s (Municipal Separate Stormwater Sewer Systems), industrial systems, and certain animal feeding operations. EPA does *not* have authority over agricultural activities (except as noted above). However, it is possible that EPA may extend its regulatory reach by re-characterizing activities over which it does have authority, i.e. re-defining animal feeding operations to include smaller farms and redefining the definition of MS4s in order to further regulate development. In addition, EPA has included “backstop measures” in the final TMDL that put the state on notice of further regulatory measures should interim goals (particularly the half-way mark at 2017) not be achieved.

The TMDL and WIP are not discretionary acts. The establishment of a TMDL is a requirement of the Clean Water Act, which is being enforced by a consent decree. While Virginia can engage the EPA on the specifics of the TMDL and the validity of the model used to establish the TMDL, EPA will remain focused on meeting the required deadlines for completing the TMDL and implementing the plans.

Chesapeake Bay and Local Waters

It is important to note that the Bay TMDL supplements rather than replaces existing TMDL requirements for local streams and rivers. In the Rivanna watershed alone, over half of the sampled streams do not meet Virginia’s water quality standards. TMDLs have been written for segments of the Rivanna that are impaired because they either do not support aquatic life or are not safe for recreational contact due to excessive levels of bacteria. A TMDL study is underway now for several Charlottesville and Albemarle streams with excessive sedimentation. Moores Creek watershed will benefit from an infusion of cost-share funding to help landowners address problems that have contribute to its TMDL listing for excessive bacteria. There are stream segments in Fluvanna and Greene Counties that also do not meet water quality standards. Everything done now to help restore these local waters to health also will help downstream.

Piedmont Regional Pilot Project

The purpose of the WIP II is to outline *how* Virginia will meet the pollution reductions needed to achieve water quality in the Bay and especially how local governments and

other partners (land owners, farmers, citizens) will be engaged to assist in that process. TJPDC and RRBC worked together in 2010 on the Piedmont Regional Pilot Project to identify ways of engaging local governments and local affected groups through the WIP development process. The pilot project, which included roundtables of local farmers, nursery owners, permit holders, and other affected groups, yielded important "lessons learned," which were forwarded to EPA and Virginia. Many of these recommendations informed Virginia's request for information from local governments.

Phase II Watershed Implementation Planning

Since January 2011, Virginia DCR has been working with local governments, primarily through the PDCs, to provide information and guidance so that local governments can provide the requested information for the WIP II due from Virginia to EPA by March 30, 2012. TJPDC received funding from EPA through the National Fish & Wildlife Foundation to assist local governments in the planning district. As part of this grant, TJPDC contracted with RRBC to provide direct support to Rivanna localities in collecting and assessing available data and developing the submission data and information requested by DCR.

In order to identify the particular strategies that will be necessary for achieving water quality in the Bay, Virginia relies on output from the Chesapeake Bay Model that has been developed by EPA over the course of 30 years and that has been thoroughly peer-reviewed and regularly calibrated to real-world water quality data obtained throughout the watershed. (The Chesapeake Bay Model consists of a group of inter-related models that link land use change, air deposition, climatic and water quality data, and Bay water quality response. They are often referred to together as "the Chesapeake Bay Model.") Like all models, the Bay Model does not perfectly describe the watershed and is limited by the quality of the data input to the model. It has been found to be accurate in predicting the response of the main-stem of the Chesapeake Bay to pollution reductions within the watersheds of the main tributaries. It is not as accurate at the local scale (cities and counties), which is one reason why Virginia DCR is requesting better information from local governments.

Data Requested by DCR

The November 9, 2011, letter from DCR outlines the five types of information being requested of local governments:

1. Develop a current BMP inventory – this information will be used to update implementation progress data in the Chesapeake Bay model.

2. Evaluate the land use / land cover information included in the model and provide more accurate land cover information you may have – this will be of tremendous assistance in ensuring that model revisions made in the future will more accurately reflect land use information in your locality.

3. Review the 2025 BMP scenarios as identified in the Phase I WIP and develop preferred local BMP scenarios that provide a similar level of treatment – identified local BMP scenarios will be aggregated and incorporated into the Phase II WIP.

4. Develop strategies to implement the preferred BMP scenarios – *strategies also will*

be aggregated and used in the development of Virginia's Phase II WIP.

5. Identify any resource needs 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 the implementation of the WIP.

Information and Data Gathering with Rivanna Watershed Localities

RRBC focused on providing assistance to Greene and Fluvanna counties and shared approaches, as requested, with staff from Charlottesville and Albemarle County. We assessed the default load reduction targets and scenarios suggested by DCR and provided better options. We utilized the Rivanna & Vicinity Land Cover Map produced in 2009 to evaluate land cover assumed by the Bay model. We relied heavily on existing documents to identify strategies that have already been endorsed by the localities, such as comprehensive plans and recent water quality studies and reports. In addition, we brought to the discussion analyses of growth patterns and existing and predicted local stream health for strategies that will help protect local water quality and overall watersheds health. RRBC also worked with Culpeper and Thomas Jefferson SWCD, Virginia Department of Mines, Minerals, and Energy, Virginia Department of Forestry, and Virginia Cooperative Extension to obtain accurate land use and BMP data within the Rivanna watershed.

While there has not been sufficient time nor, in many instances, adequate information and tools provided by DCR, to provide a robust set of data, we believe that the discussions have been productive and the submission data are adequate and will serve the localities now and in to the future. The Chesapeake Bay Model that supports the Bay TMDL will continue to be utilized as we move forward towards the 2017 goals, so familiarity with the Model and the kind of data needed will serve the localities moving forward. Future efforts, including the development of codes and ordinances, updates to comprehensive plans, and implementing the new VA stormwater regulations, will be increasingly coordinated to Bay TMDL activities. The localities' proactive responses will serve to help with these and other activities moving forward.

Attachments

1. November 8, 2011, letter from DCR to local governments
2. November 18, 2011, Senate Finance Committee Report: Chesapeake Bay TMDL Watershed Implementation Plan: What Will it Cost to Meet Virginia's Goals?

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
(804) 786-1712

November 8, 2011

Dear :

As previously communicated, Virginia is in the process of developing a Phase II Watershed Implementation Plan (WIP) to help guide the cleanup efforts for the Chesapeake Bay. The Phase II WIP will be a refinement of the Phase I WIP that was developed to address the Chesapeake Bay TMDL. In our review of the recent revision to the Chesapeake Bay model that EPA is using to estimate nutrient loads to the Bay, we have identified several key problems with the model. Many of these issues stem from the improper representation of nutrient management planning on agricultural lands. We are working diligently with EPA to resolve these concerns.

In light of the above concerns about the Chesapeake Bay watershed model, we are pursuing two concurrent paths. First, we will continue discussions with EPA on how to refine the model to more accurately reflect the real benefits of agricultural nutrient management planning.

Second, as discussions with EPA progress, we will continue with the Phase II WIP planning process. Due to the limitations of the model we are modifying our approach. The most significant change will be a shift in focus away from establishing local reduction goals to BMP implementation levels of effort. Accordingly, we are slightly modifying the information we are asking local governments, Planning District Commissions (PDC) and Soil and Water Conservation Districts to provide in support of the WIP II document (note that most of the information is the same as previously requested):

- Develop a current BMP inventory – this information will be used to update implementation progress data in the Chesapeake Bay model;
- Evaluate the land use / land cover information included in the model and provide more accurate land cover information you may have – this will be of tremendous assistance in ensuring that model revisions made in the future will more accurately reflect land use information in your locality;
- Review the 2017 and 2025 BMP scenarios as identified in the Phase I WIP and develop preferred local BMP scenarios that provide a similar level of treatment – identified local BMP scenarios will be aggregated and incorporated into the Phase II WIP;
- Develop strategies to implement the preferred BMP scenarios – strategies will also be aggregated and used in the development of Virginia's Phase II WIP; and
- Identify any resource needs 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 the implementation of the WIP.

To achieve these objectives, we will provide you with the latest Chesapeake Bay model information for your area, recognizing that the model shortcomings will likely raise questions. We will

provide access to an online tool called the Virginia Assessment and Scenario Tool (VAST), which will allow you to develop alternative BMP implementation scenarios and serve as a mechanism for you to report your information to the state. Training to local government staff has taken place on the use of the VAST tool throughout the state and hopefully these sessions have been beneficial. The deadline for submission of local information in support of the Phase II WIP is February 1, 2012. If local information is not provided before that date, the BMP scenarios developed as part of the Phase I WIP process in 2010 will be used as the default information for your locality.

To further assist you, we have provided grant funding for Phase II planning assistance and offered several sources of technical assistance to both PDCs and local governments. Specific information about sources of assistance has been communicated to your staff. Your staff will also be provided with a template for submission of the strategy and resource needs described above.

The approach the Commonwealth is using is one that we believe will result in the development of a plan that contains strategies that are both cost effective and locally appropriate. It is intended to allow flexibility for localities to use local information and existing program capacity to inform the development of Virginia's Phase II Watershed Implementation Plan. We will continue to work closely with the PDCs, localities, and Soil and Water Conservation Districts to assist and facilitate the process. We hope that you will continue to engage and participate, so that we may work together to achieve our common goals of improving the quality of local streams and the Chesapeake Bay over the next 15 years and into the future.

If you have questions regarding this process, please do not hesitate to contact (insert DCR local liaison name and contact information).

Sincerely,

David A. Johnson

cc: Appropriate PDC Executive Director

SENATE OF VIRGINIA

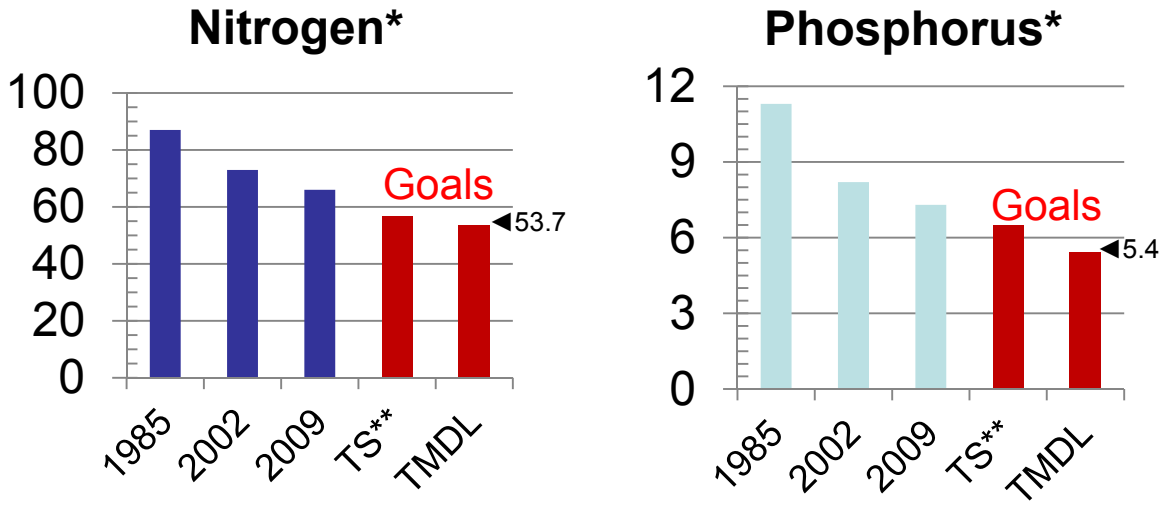
Senate Finance Committee

Chesapeake Bay TMDL Watershed Implementation Plan: What Will it Cost to Meet Virginia's Goals?

November 18, 2011

What is the Chesapeake Bay TMDL?

- Referred to as a "pollution diet" for the Chesapeake Bay, TMDL is the Total Maximum Daily Load of nutrients and sediment that can enter the Bay while still achieving water quality standards.
  - Established by the U.S. Environmental Protection Agency under authority of the federal Clean Water Act of 1972.
  - Responds to consent decrees in federal court cases due to insufficient progress and continued poor water quality in the Chesapeake Bay, despite extensive restoration efforts over the past 25 years.



*** Virginia's Nitrogen and Phosphorus loads into the Chesapeake Bay in million pounds per year.**

****TS refers to the Tributary Strategy goals adopted by Virginia in 2005.**

What is different?

- Virginia has had TMDLs as part of its tributary strategies for years.
  - Prior efforts were focused on individual stream or river segments.
  - The Chesapeake Bay TMDL identifies pollution reductions for the entire Bay watershed, including part of six states (Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia) and the District of Columbia. Adopted in 2010, it is the largest TMDL ever developed by the EPA.
- The plan requires full implementation by 2025, with at least 60 percent of actions completed by 2017.
  - Two year milestones to measure incremental progress.
- The EPA established specific watershed-wide pollution reduction goals for the Bay:
  - 25 percent reduction in nitrogen.
  - 24 percent reduction in phosphorus.
  - 20 percent reduction in sediment.
- The Bay TMDL is comprised of 92 smaller TMDLs for individual segments, of which 39 are in Virginia.
  - All 39 of the Virginia segments are “impaired”.

Watershed Implementation Plans

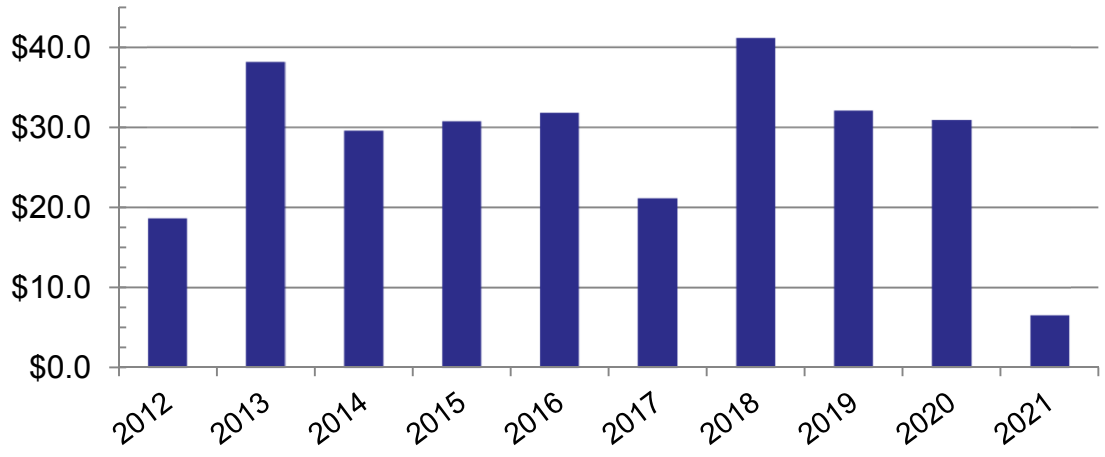
- The Bay TMDL requires all states in the Chesapeake Bay region to develop Watershed Implementation Plans (WIP) to meet specific pollution reduction goals.
  - The WIP details how and when the states will meet pollution allocations for each sector in each waterway segment.
- Virginia submitted a Phase I WIP to the EPA in November, 2010.
  - Phase I is a statewide plan to meet federal goals.
  - Phase II, due by March, 2012, will detail more locality specific plans.
  - Phase III will be revised in 2017 based on progress made to date.
- This presentation will examine 3 aspects of the WIP:
  - What will it cost?
  - Who will pay for it?
  - How will it be funded?
- Initial estimates have suggested Virginia's potential costs are in the range of $7.0 billion to $10.0 billion by 2025.
  - Some elements of the WIP can be estimated with a fair level of confidence while others are difficult to project.
- Many of these costs would already have been required to meet 2005 Tributary Strategy goals; the main differences are slightly more stringent goals, a defined implementation schedule and the potential for sanctions if goals are not met.

What is in the WIP?

- The Watershed Implementation Plan includes specific strategies for each of the major sources of pollution in the Chesapeake Bay Watershed. Four major sectors are:
  - Wastewater treatment plants.
  - Agricultural runoff.
  - Urban/suburban stormwater runoff.
  - Onsite wastewater/septic systems.
- The WIP is a continuation of work begun with the 1983 Chesapeake Bay Agreement, Virginia's 1998 Water Quality Improvement Act and 2005 Tributary Strategies.
  - Substantial investments have been made in wastewater treatment plant upgrades and agricultural best management practices.
    - Implementing the WIP will require continued actions on the part of the state, localities and farmers.
  - Urban/suburban stormwater management and onsite wastewater/septic systems will require significant additional strategies and investment.
    - Since there is less experience in dealing with these areas, implementation costs will be more difficult to predict.
- Regional Planning District Commissions will play a key role in developing locality-specific strategies for the Phase II WIP.

Wastewater Facilities

- Significant investment and progress has already been made.
  - Since 1998, the Commonwealth and local governments have committed to eligible point source nutrient reduction technology projects totaling almost $1.6 billion.
  - Local governments' share of these projects is $827.2 million or 52 percent of eligible project costs.
  - The state share totals $752.0 million or 48 percent.
- Current shortfall for state share of signed grant agreements exceeds $104.4 million above available funding.
- Further upgrades to meet goals are estimated at $586.7 million between now and 2021.
  - Additional local funding to match state contributions is projected at $305.0 million.
  - The state share of these projects, estimated at $281.6 million, is projected by fiscal year as follows ($ in millions):



Combined Sewer Overflow

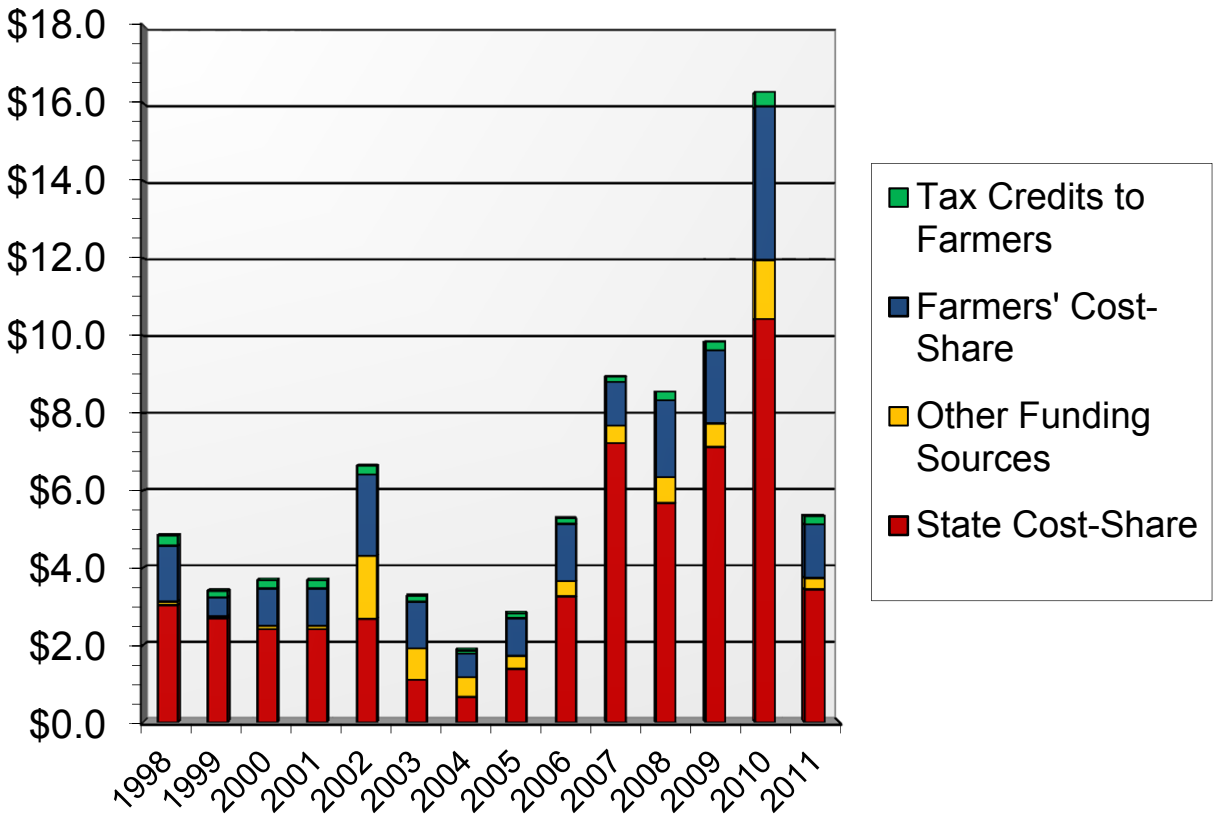
- Combined Sewer Overflow projects in Richmond and Lynchburg have also made substantial progress; much work is yet to be done.
  - CSO projects are required by other federal court consent orders.
  - However, the Virginia WIP does count pollution reduction from these projects as part of the TMDL goals.

($ in millions)	Lynchburg	Richmond
Estimated Total Project Costs	$500.0	$776.0
Expenditures to Date	**$220.0**	**$276.0**
Local Contribution	$154.0	$199.0
State Contribution	$25.0	$23.0
Federal Contribution	$41.0	$54.0
Estimated Remaining Costs	**$280.0**	**$500.0**

Agricultural Runoff

- Agricultural Best Management Practices have historically been funded on a cost share basis, requiring farmers to match state funding.
  - A refundable tax credit is also available to farmers for approved expenditures.

Agricultural Best Management Practices
VA Cost-Share and Farmer Contributions
FY 1998-2011 ($ in millions)



Agricultural BMPs Needed to Meet TMDL Goals

- The Department of Conservation and Recreation (DCR) provided estimates of costs to meet goals in the Chesapeake Bay watershed ($ in millions):

Fiscal Year	State Share	Farmer's Share *	Total
2012	$36.9**	$14.4	$52.3
2013	$39.8	$15.4	$55.3
2014	$42.4	$16.5	$58.9
2015	$47.5	$18.4	$65.9
2016	$58.3	$22.6	$80.9
2017	$60.2	$23.4	$83.6
2018***	$65.8	$25.5	$91.3
Total	$350.9	$136.5	$487.4

* Farmer's share calculated on historical average of a 28 percent cost-share; actual match varies by type of BMP.

** Amount included in Chapter 890 (2011 Appropriations Act).

*** Will be revised in accordance with Phase III WIP.

Agricultural BMPs: The Rest of the Story

- There are two major limiting factors that will impact the ability to expand the use of agricultural BMPs:
  - Technical assistance must be provided by local Soil and Water Conservation Districts to ensure practices are properly implemented.
    - There is currently no base funding for this; past funding has been sporadic (based on a percentage of WQIF funds).
    - The funding need is estimated at $5.8 million in FY 2013, increasing to $9.6 million by FY 2018.
    - Technical assistance includes, but is not limited to:
      - Marketing the programs to farmers.
      - Assisting in and approving design of practices.
      - Verifying that each practice has been properly completed.
      - Verifying each farmer has invested required match.
      - Completing paperwork for processing state payments.
  - Farmers' ability to meet cost share requirements varies.
    - The out-of-pocket cost of a project may exceed the ability of an otherwise willing farmer to participate in the program. Current cost share requirements are not means-tested, nor do they provide for hardship exemptions.
- The Commonwealth must also continue addressing the Southern Rivers TMDLs. The need is estimated at $26.8 million in FY 2013, increasing to $44.3 million by FY 2018 .

Urban/Suburban Stormwater

- Revised Virginia Stormwater Management Regulations were effective on September 13, 2011.
- Cost of complying with new regulations will be incurred in new construction. However, costs can be mitigated by building compliance into initial site design.
- Retrofitting of existing stormwater systems will be costly and will likely be borne by local governments.
- Most, but not all, local stormwater management programs in the Chesapeake Bay watershed are covered under the Municipal Separate Storm Sewer System (MS4) permit program.
- Local government-imposed stormwater utility fees will likely become the main source for supporting future costs.
  - Historically, local governments have used general funds to pay for stormwater management.
  - Local stormwater utility fees are increasingly being imposed; they are either billed directly, added on to real property tax bills, or monthly water/sewer utility bills.

Methodology for Stormwater Cost Estimates

- Utilizes the Virginia Runoff Reduction Method, which estimates stormwater runoff volume reduction, as well as sediment and nutrient load removed by specific stormwater Best Management Practice (BMP) performance.
  - Considers soil type, land cover and BMP applicability.
  - Estimates are based on applying most effective types of structural BMPs to meet pollution reductions.
  - The high end of the range is based on the assumption that structural BMP retrofits are required to reduce nutrients allocated to urban stormwater in the Phase I WIP.
  - The low end of the range is based on percentages of pervious and impervious land in each locality.
    - Assumes additional reductions will occur from Urban Nutrient Management on 90 percent of pervious lands.
- The Phase I WIP cost estimates should be viewed as an "order of magnitude" estimate because one treatment scenario was applied to all localities in the Bay watershed.
  - The Phase II WIP will allow localities to identify more cost-effective nutrient management actions and non-structural BMPs.

Cost Estimates of Stormwater Management

- The following estimates for Chesapeake Bay watershed-wide stormwater retrofits have been provided by a consultant working with Planning District Commissions and local governments:

Chesapeake Bay TMDL Costs	Range ($ in billions)
Estimated Total Local and VDOT Capital Costs	$9.4 to $11.5
Estimated Annual Costs*	$1.0 to $1.2
Estimated Average Annual Stormwater Bills	**Range ($ per year)**
Residential House	$240 to $300
Convenience Store/ Gas Station	$2,200 to $2,900
Neighborhood Shopping Center	$14,500 to $19,100
Regional Mall	$217,400 to $286,800

*Assumes financing over 30 years at 5.5% interest rate and O&M costs estimated at 5% of construction cost.
Source: Greeley and Hansen Environmental Engineers

Examples of Stormwater Estimates

- The following is a sample of the range of estimated capital costs of stormwater retrofits for selected localities:

Locality	Range ($ in millions)
Fairfax Co.	$651 to $845
Virginia Beach	$323 to $429
Norfolk	$280 to $318
Richmond City	$159 to $305
Suffolk	$109 to $211
Lynchburg	$109 to $201
James City Co.	$87 to $149
Isle of Wight Co.	$40 to $79
Surry Co.	$7 to $13

- The Virginia Department of Transportation, which is also an MS4 permit holder, projects potential construction costs of $2.1 billion and up to $700 million annually for maintenance.

Onsite Wastewater/ Septic Systems

- EPA estimates there are over 536,000 onsite wastewater/septic systems in the Virginia portion of the Chesapeake Bay watershed.
  - Virginia Dept. of Health has a project underway to determine the exact number by 2014.
  - It is estimated that a very small percentage of these existing systems provide for any nutrient reduction.
- Proposed VDH regulations will require all new alternative systems in the Chesapeake Bay watershed to provide for nutrient removal.
  - These alternative systems cost substantially more than conventional systems and require annual maintenance.
  - The cost of upgrades and maintenance will be borne by property owners.
  - Conventional systems can still be installed where site characteristics permit, but they will not provide nutrient removal needed to meet goals.
- The WIP also suggests proposing legislation to require pump out of all systems in the entire Bay watershed every five years (current policy in Bay Preservation Act areas).

Septic System Cost Estimates

- It is estimated that 12,000 systems will need to be retrofitted each year with alternative systems, at an additional cost of $6,000 to $12,400 per system.
- Annual maintenance costs of these systems range from $300 to $500 per year.
- Total costs are projected at an average of $114 million per year over 14 years for a total of $1.6 billion, which will be borne by septic system owners.
- It may become more cost-effective for system owners to consider connecting to community or municipal systems, where available.
- The WIP suggests seeking legislative approval to establish tax credits for upgrade or replacement of existing systems and exploring other financial incentives for low and moderate income households.
  - 2009 legislation authorized establishment of a "betterment loan" program provided by private lenders.

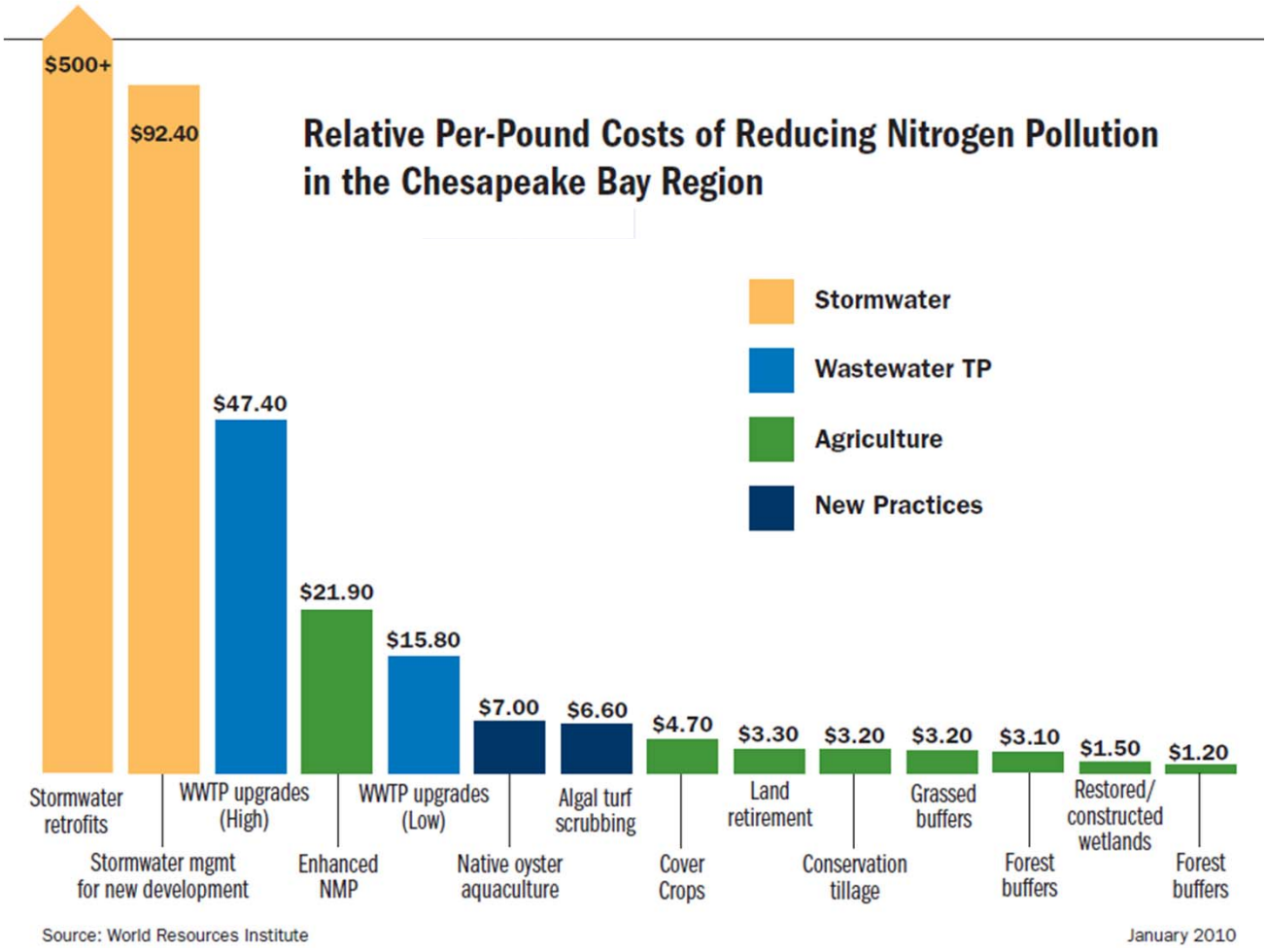
Summary and Conclusions

- What will this all cost?
- Who will pay for it?
- How will it be funded?

	Projected Total Cost ($ in billions)	Who Pays	Potential State Costs ($ in billions)	Potential Sources of Funding
Wastewater (including CSOs)	$1.4	State Govt./Local Govt./Rate-payers	$0.3 (plus $78 million for CSOs?)	WQIF, State GF, Bonds /Local GF, Bonds/Tax Assessments, Sewer Rates
Agriculture	$1.2+	State Govt./ Farmers	$0.8+	WQIF, State GF/ Agribusinesses
Stormwater	$9.4 to $11.5 (including VDOT)	Local Govt./ Property Owners/ VDOT	$2.1 (VDOT Share)	Local GF, Bonds/Utility Fees, Assessments/ Transportation Trust Fund
Onsite/ Septic Systems	$1.6	Property Owners	Unknown What Role State May Play	"Betterment loans", Potential for Tax Credits or Grants
Bay TMDL Total	**$13.6 to $15.7**	**Potential State Total**	**$3.2+**	

Mitigating impact with cost-effective methods

- The WIP recognizes flexibility in utilizing the most cost-effective strategies, as long as goals are met.
  - Phase II WIP can identify where costs can be reduced.
  - Less costly methods can achieve the same nutrient and sediment reductions.



For more information on nutrient trading and an updated version of this cost-curve, please visit the World Resources Institute Website at: http://www.wri.org/publication/how-nutrient-trading-could-help-restore-the-chesapeake-bay

Nutrient Credit Trading

- EPA will allow trading of nutrient credits as a strategy to reduce costs.
  - Credits earned by projects that exceed nutrient reductions targets can be traded to other projects that fall short of targets.
  - Less costly strategies can provide credits to reduce costs of more expensive projects.
- Virginia first established the Chesapeake Bay Watershed Nutrient Credit Exchange Program in 2005.
  - Market-based point source nutrient credit trading program.
  - 2009 General Assembly expanded program to allow for stormwater nonpoint nutrient offsets.
- Virginia's WIP includes a plan to expand the exchange program as way to mitigate costs.
  - A resolution was passed by the 2011 General Assembly to direct a study of potential further expansion of the program.
  - Based on the results of the study, legislation will be proposed to the 2012 General Assembly to allow for future expansion, potentially to include MS4 Permits.

Cost of Failing to Meet Goals

- EPA can impose "backstops" to ensure goals are met.
  - EPA authority is basically limited to wastewater, industrial permits, municipal separate storm system (MS4) permits and combined animal feeding operations.
  - Failure to meet goals in other areas can be addressed by reducing allowable loading in these permitted activities.
- The economic benefit of a clean Bay.
  - Tourism in the Chesapeake Bay region of Virginia generates over $600 million annually.
  - Between 1994 and 2004, the value of Virginia's commercial seafood harvest decreased by 30 percent.
    - The loss in commercial oyster harvest in Virginia alone is estimated to be over $2.0 billion. More oysters were harvested in 1900 than in 2000.
    - Oyster populations have declined to less than one percent of historical levels.
- Protection of municipal and private drinking water supplies.
  - Costs substantially less to treat cleaner source water.
- Quality of life.
  - Immeasurable benefits of clean water include health, recreation, increased property values and scenic beauty.

Issues Facing 2012 General Assembly

- Distribution of the Water Quality Improvement Fund.
  - $50.1 million is available from the statutorily required deposit to the WQIF.
  - A recommendation for use of these funds will be included in the Governor's introduced budget.
- Filling the $104.4 million shortfall in the DEQ point source fund for existing projects with signed grant agreements, in addition to funding for projects due in the 2012-2014 biennium.
- Providing funding for agricultural best management practices; statewide need is estimated by DCR at $137.5 million for the 2012-2014 biennium.
- Considering potential legislation regarding onsite wastewater/septic systems, possibly to include financial assistance for low income property owners.
- Considering potential expansion of Nutrient Credit Exchange Program.
- Reviewing draft of Phase II WIP and providing guidance to seek most cost-effective solutions.