REPORT OF THE

Joint Subcommittee Studying Options to Provide Funding for the Clean-Up of Virginia's Polluted Waters, including the Chesapeake Bay and Its Tributaries

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 20

COMMONWEALTH OF VIRGINIA
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Joint Subcommittee Members

The Honorable Vincent F. Callahan, Jr. (Chairman)
The Honorable Harry J. Parrish
The Honorable M. Kirkland Cox
The Honorable L. Scott Lingamfelter
The Honorable John H. Chichester
The Honorable Charles R. Hawkins
The Honorable Robert S. Bloxom
The Honorable W. Tayloe Murphy, Jr.

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EXECUTIVE SUMMARY

The Joint Subcommittee to study options to provide funding for the cleanup of Virginia's polluted waters, including the Chesapeake Bay and its tributaries, was created by House Joint Resolution No. 640 (HJR 640) during the 2005 General Assembly Session for a one-year period. The members of the Joint Subcommittee were: Delegate Vincent F. Callahan, Jr., Chairman; Senator John H. Chichester, Vice Chairman; Delegate Harry J. Parrish; Delegate M. Kirkland Cox; Delegate L. Scott Lingamfelter; Senator Charles R. Hawkins; The Honorable W. Tayloe Murphy, Jr., ex officio; The Honorable Robert S. Bloxom, ex officio.

The joint subcommittee was specifically directed to determine a long-term funding source that would sufficiently and predictably generate the necessary revenue to fund the pollution reduction measures necessary to restore Virginia's polluted waters. The joint subcommittee was charged with giving specific attention to the Commonwealth's commitment and legal obligation to restore the polluted waters of the Chesapeake Bay and its tidal tributaries.

The joint subcommittee met four times during 2005 on May 12, July 20, September 29, and November 14. It received testimony that the estimated cost to cleanup Virginia's waters by 2010 is $12.5 billion. It quickly became clear that such a large sum could not be generated by 2010. In addition, once Virginia's waters have been cleaned up, the annual cost to maintain clean waterways in the Commonwealth could well exceed $80 million. These initial cleanup and maintenance costs would be shared amongst the Commonwealth, local governments, private industry, and citizens.

The joint subcommittee learned that certain strategies for cleaning up Virginia's waters had a greater cost-benefit than other strategies and techniques. Some of the strategies and techniques that would yield cost-beneficial results include upgrading Virginia's wastewater treatment plants, utilization of nutrient management plans, conservation tillage practices, use of cover crops, and diet and feed adjustments for agricultural animals. Representatives from the State of Maryland briefed the subcommittee on Maryland's programs for cleaning up the Chesapeake Bay. Staff presented several options to the joint subcommittee for funding the cleanup of Virginia's waters. These included the use of both existing and new sources of revenue, or a combination thereof. Although the joint subcommittee did not make specific recommendations to the General Assembly, all members of the joint subcommittee support additional funding for cleanup of Virginia's waters.

INTRODUCTION

Background

The Clean Water Act requires every state to adopt water quality standards and to review such standards at least once every three years. Each state is further required, as appropriate, to modify its water quality standards or to adopt new standards. *See* 33 U.S.C. § 1313 (c). The State Water Control Board by statute has been given the responsibility to adopt and modify water quality standards for the waters of the Commonwealth consistent with the requirements under the Clean Water Act. *See* subdivision (3a) of § 62.1-44.15. The State Water Control Board is adopting new water quality standards to protect the Chesapeake Bay from excess nitrogen and phosphorous. Virginia Pollutant Discharge Elimination System (VPDES) permits issued by the State Water Control Board allowing the discharge of pollutants into the waters of the Commonwealth must be consistent with the water quality standards adopted by the Board.

In addition, for each body of water in the Commonwealth that is listed on the Environmental Protection Agency's (EPA) list of impaired waters, the Clean Water Act requires that a total maximum daily load (TMDL) be established. A TMDL is a determination of the maximum amount of a pollutant that a body of water can assimilate and still meet water quality standards. Different TMDL allocations are in effect for point and nonpoint sources of pollution. In American Canoe Association, Inc. and The American Littoral Society v. the United States Environmental Protection Agency, Carol M. Browner, United States Environmental Protection Agency, Region III, W. Michael McCabe, 30 F. Supp. 2d 908 (1998), the EPA under a consent decree agreed that the Commonwealth of Virginia would complete a TMDL for the Chesapeake Bay by 2010, or in lieu of such TMDL, the Chesapeake Bay in Virginia would meet or exceed water quality standards of the State Water Control Board by 2010. If the Commonwealth does not complete the TMDL by 2010, EPA agreed that it would complete such TMDL.

The 1983 Chesapeake Bay Agreement, the 1987 Chesapeake Bay Agreement, and the 1992 Amendments to the Chesapeake Bay Agreement were the predecessor agreements to the Chesapeake 2000 Agreement. Under such agreements, the states of Virginia, Maryland, and Pennsylvania, the District of Columbia, the Chesapeake Bay Commission, and the United States Environmental Protection Agency established the Chesapeake Bay Program setting forth objectives, initiatives, and performance measures for cleaning up the Chesapeake Bay. The agreements are commitments between the parties to clean up the Chesapeake Bay by 2010; however, there are likely no legal consequences under the agreements to any of the signatories if the Chesapeake Bay is not cleaned up by 2010.

ACTIVITIES OF THE JOINT SUBCOMMITTEE

The joint subcommittee met on May 12, July 20, September 29, and November 14, 2005, including a public hearing on November 14. Following are summaries of those meetings where the work of the joint subcommittee was undertaken.

MEETINGS

May 12

The Joint Subcommittee to Study Options to Provide a Long-term Funding Source to Clean up Virginia's Polluted Waters, Including the Chesapeake Bay and its Tributaries (HJR 640 - 2005) held its first meeting on May 12, 2005.

The first order of business was the nomination and election of Delegate Vincent F. Callahan, Jr. as Chairman, and Senator John H. Chichester as Vice Chairman.

The meeting began with an overview of the Water Quality Improvement Fund, the primary source for funding the cleanup of Virginia's waters. The Fund was created by the 1997 Session of the General Assembly. Current law dedicates 10 percent of any year-end revenue surplus and 10 percent of any year-end unreserved general fund balance to the Fund. Moneys in the Fund are used to provide grants to local governments, soil and water conservation districts, state agencies, and individuals for cleanup of point and nonpoint sources of pollution. The economic recession was the reason that no deposit was made into the Fund in Fiscal Years 2002 through 2004, as there were no year-end surpluses or balances. In addition to the year-end surplus being deposited into the Fund, for Fiscal Year 2005 the General Assembly appropriated an additional $15 million to the Fund making the total fiscal year deposit $22.7 million. For Fiscal Year 2006, in addition to the year-end surplus, the General Assembly appropriated an additional $65 million to the Fund making the total fiscal year deposit $97.4 million. Of this additional $65 million, $50 million is dedicated for wastewater improvement.

Secretary Murphy discussed issues raised by House Joint Resolution No. 640, the joint resolution that created the study. Secretary Murphy stated that there are plans and strategies in place that will clean up Virginia's waters, but the Commonwealth does not have the funding to carry out those plans. He stated that funding for natural resources in the Commonwealth hovers at or below 1% of the state budget on an annual basis.

Secretary Murphy remarked that in 1999 the Environmental Protection Agency (EPA) added the Chesapeake Bay and its tributaries to its list of impaired

waters because of the amount of nitrogen and phosphorus in the waters. EPA has established new water quality standards for the Bay and its tributaries. These standards form the basis for nutrient and sediment reduction goals. He indicated that Virginia will have to reduce its annual nitrogen discharge into the Bay and its tributaries from 77 million pounds per year to 51.4 million pounds per year and its phosphorus discharge from 10 million pounds per year to 6 million pounds per year. With respect to nonpoint sources of pollution, pollution from agricultural activities is the largest source of pollution. In Fiscal Year 2006, the Department of Conservation and Recreation will have about $30 million for making grants to reduce non-point sources of pollution.

Secretary Murphy commented that Virginia's economic prosperity is directly linked to the health of its natural resources.

Mr. Russell W. Baxter, Assistant Secretary of Natural Resources for Chesapeake Bay Coordination, followed Secretary Murphy. Mr. Baxter stated that a sample of water quality in 2004 revealed that 6,900 stream miles out of 13,200 stream miles assessed are impaired; 89,900 acres of lakes out of 109,000 acres of lakes assessed are impaired; and 1,810 square miles of estuaries out of 2,500 square miles of estuaries assessed are impaired.

Mr. Baxter discussed provisions of House Bill No. 2862/Senate Bill No. 1275 passed by the 2005 Session of the General Assembly. This legislation requires the State Water Control Board to issue to significant dischargers a Watershed General Permit authorizing point source discharge loads for total nitrogen and total phosphorus. A significant discharger can meet the maximum load authorized by acquiring nitrogen and phosphorus allocations and credits from other significant dischargers.

He also discussed provisions of House Bill No. 2777/Senate Bill No. 1235/Senate Bill No. 810, which provided an additional $50 million deposit into the Water Quality Improvement Fund to be used solely to finance the costs of design and installation of biological nutrient removal facilities or other nutrient removal technology at publicly owned treatment plants.

Mr. Baxter provided the joint subcommittee with the latest estimates for cleaning up the Chesapeake Bay and other impaired waters of the Commonwealth. The total cost to meet nutrient reduction commitments for all wastewater treatment plants was estimated at $1.1 billion. Of the 120 treatment plants located in the Commonwealth, 100 are publicly owned plants, and the total cost to meet nutrient reduction commitments at these plants was estimated to be $1.014 billion. Mr. Baxter concluded by estimating the total costs for cleaning up the impaired waters of the Commonwealth at $12.5 billion, a cost to be shared by the Commonwealth, local governments, agricultural producers, and developers, among other persons.

Dr. Jack Greer of the Environmental Finance Center at Maryland Sea Grant College followed Mr. Baxter. Dr. Greer helped to staff the Chesapeake Bay Watershed Blue Ribbon Finance Panel, which was formed pursuant to Chesapeake Executive Council Directive No. 03-02. The Blue Ribbon Finance Panel was charged with identifying funding for cleanup of the Chesapeake Bay to facilitate removal of the Bay from EPA's list of impaired waters by 2010. Dr. Greer discussed the work done by the Blue Ribbon Finance Panel and presented some of its recommendations. The Blue Ribbon Finance Panel recommended the creation of a Chesapeake Bay Financing Authority that would be capitalized by revenue appropriations from the Bay states and the federal government. The Financing Authority as an independent authority might be able to direct funds to Bay Watershed projects that would provide the greatest amount of return in terms of nutrient and sediment reductions. The Blue Ribbon Finance Panel recommended that the federal government provide for 80 percent of the Fund's capitalization with the Bay states contributing 20 percent of the Fund's capitalization.

Dr. Greer stated that the Blue Ribbon Finance Panel also recommended that the Bay states establish revolving loan funds to provide ongoing funding for cleanup of the Bay. The Finance Panel recognized that agricultural producers will need financial assistance in the form of federal and state grants and other subsidies to institute best management practices for nutrient reduction. The Finance Panel noted that the sewer and septic fees imposed by the state of Maryland for cleanup of the Chesapeake Bay could serve as a model for funding wastewater treatment improvements and other clean-up efforts.

Ms. Anne Jennings, Virginia Executive Director of the Chesapeake Bay Foundation, was the final speaker. Ms. Jennings stated that the Foundation and Virginia's citizens support the $50 million commitment made by the General Assembly in House Bill No. 2777/Senate Bill No. 1235/Senate Bill No. 810 for cleanup of Virginia's waters. Ms. Jennings commented that the results from a recent professionally administered poll revealed that Virginia citizens consider pollution of the Chesapeake Bay and the waters of the Commonwealth to be a serious problem, more of a problem than the economy, public safety, education, and taxes. Ms. Jennings stated that there is a need for a stable, consistent funding source for cleanup of the Bay. Ms. Jennings indicated that any new tax or fee that may be imposed for cleanup of the Bay should provide an exemption for low-income households and that the collection of the tax or fee be as administratively simple as possible. She concluded by saying that Virginians are willing to pay their share of the bill for bringing the Chesapeake Bay back to health.

July 20

The Joint Subcommittee to Study Options to Provide a Long-term Funding Source to Clean up Virginia's Polluted Waters, Including the Chesapeake Bay and its Tributaries (HJR 640 - 2005) held its second meeting on July 20, 2005. The meeting began with an overview by staff of highpoints from the first meeting, and a preview of the second meeting.

Russell W. Baxter, Assistant Secretary of Natural Resources for Chesapeake Bay Coordination, presented a summary of the Report of the Governor's Commission on Natural Resources Funding submitted on October 9, 2003. Some of the findings of the Commission included that: (i) additional funding is needed and such funding will result in measurable environmental improvements and positive economic activity, and (ii) the focus should be on water quality and land conservation. The Commission recommended that the level of general fund support must increase, but recognized that general funds were likely to be insufficient. Accordingly, the Commission recommended that new sources of dedicated revenue be explored that meet certain criteria including: (a) nexus between source of funds and resource, (b) ease of collection, (c) breadth of applicability, and (iv) feasibility.

Based on these criteria, the Commission's consensus recommendations for additional revenue were: (i) a water utility fee of $2.00 per month that would raise approximately $46 million annually, and (ii) a document recording fee of $10 per document that would raise approximately $20 million annually. The Commission recommended that the revenue from these fees be deposited into a newly established Virginia Natural and Historical Resources Fund.

Mr. Baxter then presented a summary of the cost to the Commonwealth to clean up Virginia's waters. Specifically, he stated that the state's share of the cost to clean up the Chesapeake Bay and its tributaries for the period 2005-2010 would be about $1.74 billion, and the state's share of the cost to clean up Virginia's southern rivers would be about $600 million, for a total of $2.34 billion.

The next speaker, Ann Swanson, Executive Director of the Chesapeake Bay Commission, presented the six most cost-effective strategies for reducing nutrient and sediment pollution in the Chesapeake Bay as determined by her Commission. These strategies are: (i) wastewater treatment plant upgrades, (ii) traditional nutrient management (prescribing the use and timing of nutrients in manure and commercial fertilizer to reduce excess application while assuring no loss of yield), (iii) conservation tillage (reducing erosion and nutrient runoff by planting crops with minimal cultivation while retaining cover crops and crop residue that covers a minimum of 30% of the field), (iv) cover crops (consuming excess nutrients by planting small grain crops in the fall that are not fertilized and are killed or plowed under in the spring), (v) diet and feed adjustments (adding feed additives to

increase animals' absorption of nutrients and thereby reducing nutrients excreted in manure), and (vi) enhanced nutrient management (reducing nutrients applied to cropland by an additional 15%. The first four of these strategies can be implemented in the short-term, while the other two will take more time.

Ms. Swanson said that upgrades to wastewater treatment plants constitute the single most beneficial nutrient reduction practice, delivering greater nitrogen and phosphorous reductions than the five agricultural-related strategies combined. She stated that, in addition to the costs presented by Mr. Baxter, other costs will be ongoing, with needs extending far beyond 2010 because, for example: (i) sewage treatment plants have a 20-year design life; and (ii) cover crops must be purchased every year. As a result, Ms. Swanson concluded that establishing a significant, long-term dedicated funding source is the only way to remove Virginia's waters from the Federal Dirty Waters List and restore the Bay.

Robert M. Summers, Director, Water Management Administration, Maryland Department of the Environment, described Maryland's two major programs to clean up its waters and the funding for them. The first program is the Biological Nutrient Removal (BNR) Program, which called for upgrades to 66 large sewage treatment plants to reduce nitrogen levels in discharge waters to 8 mg/liter. The majority of the plants have been upgraded resulting in (from 1985 levels) a 52% reduction in nitrogen discharged, and a 63% reduction in phosphorous discharged. The total state and local cost of the program is estimated at $600 million, with the state funding its portion through state general obligation bonds.

The second program involves the recent creation of the Bay Restoration Fund that will permit Maryland to achieve over 1/3 of the necessary additional nutrient reductions by: (i) further upgrading wastewater treatment plants with enhanced nutrient removal facilities, (ii) upgrading certain septic systems, and (iii) implementing cover crops on agricultural land. Funding for the wastewater treatment plants comes from a newly imposed $2.50 per month per household surcharge on sewer bills that is estimated to generate $60 million annually. This revenue will be used to support over $750 million in revenue bonds. Funding for septic tank upgrades and for cover crops comes from a new (beginning October 1, 2005) $30 annual fee on septic tank users that is estimated to generate $12.6 million per year.

Joseph H. Maroon, Director of the Virginia Department of Conservation and Recreation (DCR), described DCR's nonpoint source programs and nonpoint strategies for cleaning up Virginia's waters. His Department's programs focus on agricultural nutrient reductions because: (i) of a statutory mandate, (ii) agricultural sources contribute the largest amount of phosphorous (41%) and the second most amount of nitrogen (29%) to the Bay and Virginia's tributaries, and (iii) they are among the most cost-effective measures.

He briefly described the major agricultural programs that included cover crops, continuous no-till systems, nutrient management planning, riparian forest buffers, and animal waste control facilities.

Mr. Maroon said that obtaining the necessary results in the agricultural programs will require, among other things (i) long-term substantial funding, and (ii) a change in DCR's traditional strategy of "education/demonstration" to "implementation." He emphasized that inconsistent funding from year to year ("boom or bust") does not permit the necessary continuity of state/local staffing, and does not permit farmers to plan for the future. He concurred with the itemized costs presented by Mr. Baxter for agricultural programs.

Mr. Maroon described how DCR's practices are generally closely aligned with the Chesapeake Bay Commission's most cost-effective strategies.

The final speaker, Robert Burnley, Director of the Virginia Department of Environmental Quality (DEQ), described Virginia's point source nutrient control strategy for the Chesapeake Bay Watershed. The strategy is a combination of (i) Virginia's Tributary Strategies that define the necessary control actions, (ii) Point Source Regulations that will be developed by the State Water Control Board to govern the point source reduction programs, (iii) the Chesapeake Bay Watershed Nutrient Credit Exchange Program that will permit point-source dischargers to acquire point source offsets or to purchase credits from other dischargers who have earned the credits by exceeding their goals, and (iv) the Water Quality Improvement Fund (WQIF) that will be used to provide grants to the 125 significant treatment plants for upgrades. Mr. Burnley said that the WQIF has $65.7 million in available funds for FY 06, but needs $500 million more for the upgrades.

Mr. Burnley concluded by explaining that Virginia's point source strategies are consistent with the Chesapeake Bay Commission's most cost-effective strategies.

September 29

The Joint Subcommittee held its third meeting on September 29, 2005. The agenda included presentations on the requirements for cleaning up state waters, alternative approaches for reducing pollution from point and nonpoint sources, estimates of the costs of cleanup, and options for funding the cleanup.

Requirements for the Clean-Up of State Waters

Mr. Bob Burnley, Director of the Department of Environmental Quality, discussed the legal obligation of the state to clean up its polluted waters. Large segments of the Chesapeake Bay, its tidal tributaries, and the southern rivers are listed under the Clean Water Act as impaired waters because they exhibit at least one of the following properties: low dissolved oxygen levels, poor water clarity or algae bloom conditions, or poor quality fish food. Under the State Water Control Law, and Section 303 of the federal Clean Water Act, Virginia is required to clean up these waters. In addition, while the Chesapeake Bay 2000 Agreement does not legally obligate Virginia to restore the water quality of the Bay, it does represent a commitment by the state and the signatories to the Agreement to clean up the Bay by 2010.

The question was raised by members of the joint subcommittee as to the consequences of Virginia not cleaning up its impaired waters. An official of EPA responded by discussing the possible sanctions that could be imposed upon Virginia for not meeting the requirements of the Clean Water Act. He suggested since the water quality program is a federal program, with authority to administer the program delegated to the state, EPA has the option of taking over the program and administering it out of its regional office. If EPA found that Virginia was not making a good faith effort to clean up its impaired waters it has the option of taking the following actions: (i) developing the Total Maximum Daily Loads for Virginia's impaired waters (TMDLs); (ii) setting water quality standards for Virginia; (iii) reviewing and issuing wastewater discharge permits; or (iv) withdrawing the authority to administer the program.

Alternatives for Reducing Point and Nonpoint Sources of Pollution

Mr. David Schnare, of the Thomas Jefferson Institute, briefed the joint subcommittee on several alternatives for reducing nutrients from point and nonpoint sources. His remarks reflected three themes:

- We know more than we realize but perhaps still don't know as much as we need to;
- We rely heavily on mathematical models and perhaps not enough on empirical information; and
- A free market and the profit motive have produced the least expensive, most effective solutions.

He described four examples that reflect these themes and represent particular cost-effective strategies:

- Use spray irrigation of wastewater in which the costs of nutrient reduction is one-half the costs of using advanced water treatment. This approach is useful in small and some medium sized municipalities in rural settings;
- Control the amount of chicken litter phosphorus through the use of a proprietary silica blend. It significantly reduces phosphorus, slightly lowers bird losses, and reduces litter moisture, litter volume, ammonia, and dust;
- Reduce the impact from urban lawn fertilizers by either (i) banning lawn fertilizers, with an exception for purchased nitrogen reduction credits from other sources, or (ii) tax lawn fertilizer (e.g. $5 lbs N), with the tax dedicated to fund urban wastewater treatment;
- Promote more continuous no-till agronomy. Such an approach results in no discharge of sediment, increased crop yields, lower fuel and fertilizer costs, minimum equipment (requires only a single tractor), and reduced time in the field.

Dr. Schnare suggested, in developing and implementing its clean-up strategy, the state should promote, rather than inhibit free markets and the incentives and innovations free markets produce. Secondly, Virginia should make public investment decisions like we would any public investment, within our ability to pay the costs over the long-term and in balance with other public needs.

Estimated Needs

Mr. Russ Baxter, Assistant Secretary of Natural Resources, provided a more refined estimate of the clean-up needs for the upcoming FY'07-08 biennium. For point source upgrades, the needs will be between $190-230 million. Since the Water Quality Improvement Fund currently has a balance of $66 million, approximately $124-164 million of additional state funds will be needed through June 30, 2008. He cautioned the joint subcommittee that by December 2005 a more accurate estimate of the point source grant funding needs will be available with the completion of the Nutrient Credit Exchange Association project. The implementation costs for meeting nonpoint source pollution control measures will total approximately $90 million over the next biennium, with the Department of Conservation and Recreation being able to effectively expend $39.5 million in FY'07 and $50.6 million in FY'08. Based upon those estimates the total costs of meeting the clean-up needs over the next two years will be $214-254 million.

Funding Options

Delegate Scott Lingamfelter discussed the challenges and solutions for cleaning up the Chesapeake Bay. He suggested that emphasis be placed on mitigating any risk involved in the clean-up effort. This will involve a program that provides effective oversight, has an engaged staff, and has a strategic plan that links state and local priorities of work, and ties finances to a specific program of

work. The project's plan should include phases with attainable goals with funding aligned to each phase.

To carry out this program, he recommended the establishment of a Chesapeake Bay Clean-up Authority. The Authority's membership could be a combination of legislators, executive branch officials, and person's with pertinent experience. The Authority would be led by an executive director who has a strong background in finance and program management. The staff would consist of a finance director, marine scientist, engineer, agronomist, and hydrologist. They would be responsible for developing the "Chesapeake Bay Clean-Up Strategic Plan" through the Department of Environmental Quality, and would oversee the execution of the Plan. The authority would issue up to $1 billion in bonds through the State Treasurer to be paid off over a 10-20 year period. Fifty percent of the revenues generated by the bonds would be dedicated to point sources and 50 percent to nonpoint sources. Delegate Lingamfelter estimated that under a 10-year scenario the debt service would be $1.32 billion and for a 20-year scenario it would be $1.64 billion. The debt service on the bonds would be paid through a dedicated portion of the recordation tax revenue and $50 million per year from the General Fund.

In addition to Delegate Lingamfelter's proposal, subcommittee staff presented a number of funding options. Mr. Mark Vucci suggested the following criteria may be used in considering funding sources:

1. A nexus between the source of funding and the use of the funds;
2. The ease of collection;
3. The breath of applicability to the general public;
4. The stability of the funding source;
5. The amount of revenue generated;
6. The ease of understanding; and
7. Practical feasibility.

Some funding mechanisms for possible consideration could include using current general funds (without designating a particular revenue source), or dedicating specific current revenues, such as:

- **Recordation Tax**. The year-to-year growth in recordation tax revenues has averaged about $60 million for the past decade;
- **Insurance Premium Tax**. The State Corporation Commission license tax revenues from farm owner, homeowner, and commercial multi-peril insurance policies are approximately $42.7 million per year;
- **Sales Tax**. House Bill 2777 and Senate Bill 1235, as introduced, would have dedicated for cleanup of the state waters, one-twelfth of the revenue (up to

$160 million a year) from the 2% sales tax currently deposited into the General Fund.

Other mechanisms for possible consideration could include new taxes or fees, such as:

- **Surcharge on Insurance Policies**. Insurance premiums collected from farm owner, homeowner, and commercial multi-peril policies were approximately $1.9 billion in 2004. Each one percent charged on the insurance premiums would generate $19 million per year. Insurance companies would collect the new surcharge.
- **Capital Gains Tax on Real Estate**. A sliding scale capital gains tax could be imposed on gains from the sale of certain real estate. The scaled tax would depend on the percentage size of the gain and the length of the holding period. The tax on personal residences and certain farms could be excluded. This approach is similar to the capital gains tax proposed in 1989 (HB 1782).

November 14

The Joint Subcommittee held its final meeting on November 14, 2005.

The first part of the meeting was a public hearing. The following citizens spoke during the public hearing: James G. Byrne, Wilmer N. Stoneman, III, Katie Kyger Frazier, Charles Horn, Anne Jennings, John Tippett, Mathew Logan, Hobey Bauhan, Jim Finn, Colby Trow, Jeannette McKittrick, Bill Street, Mike Toalson, Chris Pomeroy, and Denise Thompson.

The public hearing was followed by a work session of the joint subcommittee. Each member of the joint subcommittee supported additional funding for cleanup of Virginia's waters.

Delegate Lingamfelter stated that leveraging low-interest loans could be one element of a financing plan for the cleanup of Virginia's waters. He also stated that cleanup of nonpoint sources of pollution is like a capital construction project because the cleanup of nonpoint sources of pollution will help bring back certain industries to the Commonwealth.

Delegate Cox stated that cleanup of Virginia's waters is a core responsibility of government that is rooted in the Constitution of Virginia. He indicated that cleanup of Virginia's waters should be paid from existing general fund revenues and

that the Commonwealth must provide additional funds to clean up Virginia's waters.

Delegate Parrish stated that all Virginians should share in the responsibility for cleanup of Virginia's waters and that any funding proposal should reflect this principle.

Secretary Bloxom mentioned two potential sources of revenue for cleanup of Virginia's waters. The Commonwealth could dedicate excess recordation tax revenues for clean-up purposes. In addition, the Commonwealth could impose a tax on certain capital gains realized from the sale of real estate. The tax could be imposed on a sliding scale depending on the holding period for the real estate and the amount of gain.

Secretary Murphy stated that his first preference for funding cleanup of Virginia's waters would be to use existing general fund revenues, to the extent feasible. He stated, however, that a new fee on electric utility use may also be needed in order to provide a long-term funding source that will generate sufficient and predictable revenues for cleanup of Virginia's waters. The Governor's Natural Resources Funding Commission (2003) estimated that a $1 per month electric utility fee would generate approximately $37.6 million on an annual basis.

Senator Hawkins stated that existing general fund revenues are not a reliable source of funding for cleanup of Virginia's waters because of the ebb and flow of the economy. He suggested that in economic downturns there will be little funding available for water cleanup. He stated that the source of funding for cleanup should be a new, broad-based charge that is imposed fairly on all citizens of the Commonwealth. Senator Hawkins expressed concern with issuing additional debt for clean-up purposes without establishing a new, dedicated charge for payment of the debt service.

Senator Chichester stated that the Commonwealth cannot rely upon a volatile source of revenue for cleanup of Virginia's waters. He believed that existing general fund revenues were unreliable. He feared that in a tight economy cleanup of Virginia's waters could be a priority that would not be funded. He also expressed concern with issuing debt for nonpoint sources of pollution where the debt financing did not result in a long-term capital asset. He noted that Virginia's debt capacity is finite; therefore, new charges or other sources of new revenue would be needed to pay for cleanup of Virginia's waters.

Delegate Callahan stated that new sources of revenue may be needed to pay for cleanup of Virginia's waters.

CONCLUSIONS

Cleaning up Virginia's polluted waters will take many years to complete and significant funding. The joint subcommittee was apprised of the progress to date as well as some details for controlling pollution discharge from point and nonpoint sources of pollution. The joint subcommittee received testimony on agricultural management practices that would provide the greatest amount of pollution reduction at the lowest cost. The legal framework under which the Commonwealth is currently operating in regard to the cleanup of Virginia's waters was explained. Cleaning up Virginia's waters is just the first step; to keep Virginia's waters clean will require substantial annual funding. Interested parties including environmental groups and representatives of business and government monitored the activities of the joint subcommittee and played an instrumental role in the work of the subcommittee. The joint subcommittee's Internet web page is at: http://dls.state.va.us/statewaters.htm.

The joint subcommittee affirmed the need to clean up Virginia's waters. All members of the joint subcommittee stated their support for additional funding for cleanup of Virginia's waters.

Respectfully submitted,

The Honorable Vincent F. Callahan, Jr. (Chairman)
The Honorable M. Kirkland Cox
The Honorable L. Scott Lingamfelter
The Honorable John H. Chichester
The Honorable Charles R. Hawkins

Ex Officio Members
The Honorable Robert S. Bloxom
The Honorable W. Tayloe Murphy, Jr.

2005 SESSION

ENROLLED

HOUSE JOINT RESOLUTION NO. 640

Establishing a joint subcommittee to study options to provide a long-term funding source to clean up Virginia's polluted waters, including the Chesapeake Bay and its tributaries. Report.

Agreed to by the House of Delegates, February 26, 2005
Agreed to by the Senate, February 26, 2005

WHEREAS, the Commonwealth of Virginia has a responsibility under Article XI of the Constitution of Virginia "to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth"; and

WHEREAS, the Virginia Department of Environmental Quality reported in 2004 that over 6,900 miles of rivers and streams and over 1,900 square miles of Virginia's estuaries are polluted, with these waterways and the Chesapeake Bay being listed on the federal Clean Water Act's "dirty waters" list; and

WHEREAS, the Virginia Department of Environmental Quality reported in 2004 that at least 2,700 miles of the rivers, creeks, and streams and over 110,000 acres of the lakes listed on the Clean Water Act's "dirty waters" list reside outside of the Chesapeake Bay watershed; and

WHEREAS, the Clean Water Act requires that Virginia implement cleanup strategies to restore these polluted waters in a timely fashion; and

WHEREAS, the Commonwealth's timeframe for implementing cleanup strategies is further constrained by a 1999 court consent decree; and

WHEREAS, as a result of nitrogen and phosphorous, the Chesapeake Bay, as well as portions of the Bay's tributaries, are included on the list of polluted waters; and

WHEREAS, almost two-thirds of the pollution responsible for the federal listing is attributed to inadequately treated sewage and polluted run-off from agricultural activities; and

WHEREAS, the Commonwealth of Virginia, in conjunction with other Chesapeake Bay states and the federal government, is committed under the Chesapeake 2000 Agreement to dramatically reduce nitrogen and phosphorous pollution in order to restore the health of the polluted waters of the Chesapeake Bay and its tidal tributaries; and

WHEREAS, the United States Environmental Protection Agency will dictate to the Commonwealth and local jurisdictions the actions necessary to restore the Chesapeake Bay and its tidal tributaries if state and local actions fail to restore these polluted waters to a healthy condition by 2010; and

WHEREAS, clean water is an issue of critical concern to the economies of the Commonwealth and local jurisdictions, as well as the health and welfare of the people of Virginia; and

WHEREAS, in 1989 a report entitled *Economic Importance of the Chesapeake Bay*, conservatively estimated that even in its severely degraded state the Chesapeake was worth $678 billion to the economies of Virginia and Maryland; and

WHEREAS, a recent report by the Chesapeake Bay Watershed Blue Ribbon Finance Panel, entitled *Saving a National Treasure: Financing the Cleanup of the Chesapeake Bay*, concluded that it would be difficult to identify a major segment of the region's economy that is not shaped and enhanced by the Chesapeake Bay; and

WHEREAS, the cost of achieving the required reductions in nitrogen and phosphorous pollution in Virginia is estimated to exceed $3 billion; and

WHEREAS, a recent report from the Chesapeake Bay Commission, entitled *Cost Effective Strategies for the Bay - Identifying Smart Investments for Nutrient Reduction*, establishes that a major portion of the needed pollution reductions can be achieved for significantly less money by focusing on the most cost-effective and sustainable pollution reduction methods including the modernization of sewage treatment plants and the installation of best management practices on agricultural lands; and

WHEREAS, $160 million a year would provide sufficient funds for achieving the majority of needed reductions in nitrogen and phosphorous pollution statewide by modernizing sewage treatment plants with state-of-the-art pollution removal technologies and installing best management practices on agricultural land; and

WHEREAS, although the Virginia Water Quality Improvement Fund has recently received allocations of $30 million during the 2004-2006 biennial budget to address the Commonwealth's pollution cleanup needs, the General Assembly recognizes that the allocation is inadequate and inconsistent from year-to-year; and

WHEREAS, the people of Virginia not only have a constitutional right to clean water for drinking and recreational use but they also support the allocation of additional funding to restore Virginia's streams, rivers and Chesapeake Bay; and

WHEREAS, the General Assembly has a constitutional obligation to ensure the cleanliness and safety

of Virginia's streams, rivers and the Chesapeake Bay; and

WHEREAS, the General Assembly has received for consideration proposed legislation that would impose a dedicated user fee on Virginia households in order to restore polluted streams and rivers and the Chesapeake Bay as well as proposed legislation that would dedicate a portion of the sales tax to the restoration of these waters; and

WHEREAS, the General Assembly recognizes the urgency with which it must act in order to restore polluted streams and rivers and the Chesapeake Bay, that it must allocate a significant increase in funding to this restoration, and that such funding must be consistent and dedicated to this purpose; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That a joint subcommittee be established to study options to provide a long-term funding source to clean up Virginia's polluted waters, including the Chesapeake Bay and its tributaries. The joint subcommittee shall have a total membership of eight members that shall consist of six legislative members and two ex officio members. Members shall be appointed as follows: four members of the House of Delegates, one of whom shall be the Chairman of the House Committee on Agriculture, Chesapeake and Natural Resources, one of whom shall be the Chairman of the House Committee on Appropriations, one of whom shall be the Chairman of the House Committee on Finance, and one of whom shall be appointed by the Speaker of the House of Delegates; two members of the Senate, one of whom shall be the Chairman of the Senate Committee on Agriculture, Conservation and Natural Resources, and one of whom shall be the Chairman of the Senate Committee on Finance. The Secretary of Natural Resources and the Secretary of Agriculture and Forestry or their designees shall serve ex officio with voting privileges. The joint subcommittee shall elect a chairman and vice chairman from among its membership, who shall be members of the General Assembly.

In conducting its study, the joint subcommittee shall determine the most effective means to provide a long-term funding source that will sufficiently and predictably generate the necessary revenue from sectors, including, but not limited to, state, federal, local and private sources, to fund the pollution reduction measures necessary to restore polluted waters identified on the Clean Water Act's "dirty waters" list. Specific attention shall be given to the Commonwealth's commitment and legal obligation to restore the polluted waters of the Chesapeake Bay and it tidal tributaries.

Administrative staff support shall be provided by the Office of the Clerk of the House of Delegates. Legal, research, policy analysis, and other services as requested by the joint subcommittee shall be provided by the Division of Legislative Services. Technical assistance shall be provided by Department of Environmental Quality, the Department of Conservation and Recreation, and the staffs of the House Committee on Appropriations and the Senate Committee on Finance. All agencies of the Commonwealth shall provide assistance to the joint subcommittee for this study, upon request.

The joint subcommittee shall be limited to four meetings for the 2005 interim, and the direct costs of this study shall not exceed $10,000 without approval as set out in this resolution. Approval for unbudgeted nonmember-related expenses shall require the written authorization of the chairman of the joint subcommittee and the respective Clerk. If a companion joint resolution of the other chamber is agreed to, written authorization of both Clerks shall be required.

No recommendation of the joint subcommittee shall be adopted if a majority of the House members or a majority of the Senate members appointed to the joint subcommittee (i) vote against the recommendation and (ii) vote for the recommendation to fail notwithstanding the majority vote of the joint subcommittee.

The joint subcommittee shall complete its meetings by November 30, 2005, and the chairman shall submit to the Division of Legislative Automated Systems an executive summary of its findings and recommendations no later than the first day of the 2006 Regular Session of the General Assembly. The executive summary shall state whether the joint subcommittee intends to submit to the General Assembly and the Governor a report of its findings and recommendations for publication as a House or Senate document. The executive summary and the report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports and shall be posted on the General Assembly's website.

Implementation of this resolution is subject to subsequent approval and certification by the Joint Rules Committee. The Committee may approve or disapprove expenditures for this study, extend or delay the period for the conduct of the study, or authorize additional meetings during the 2005 interim.

Water Quality Improvement Fund Background

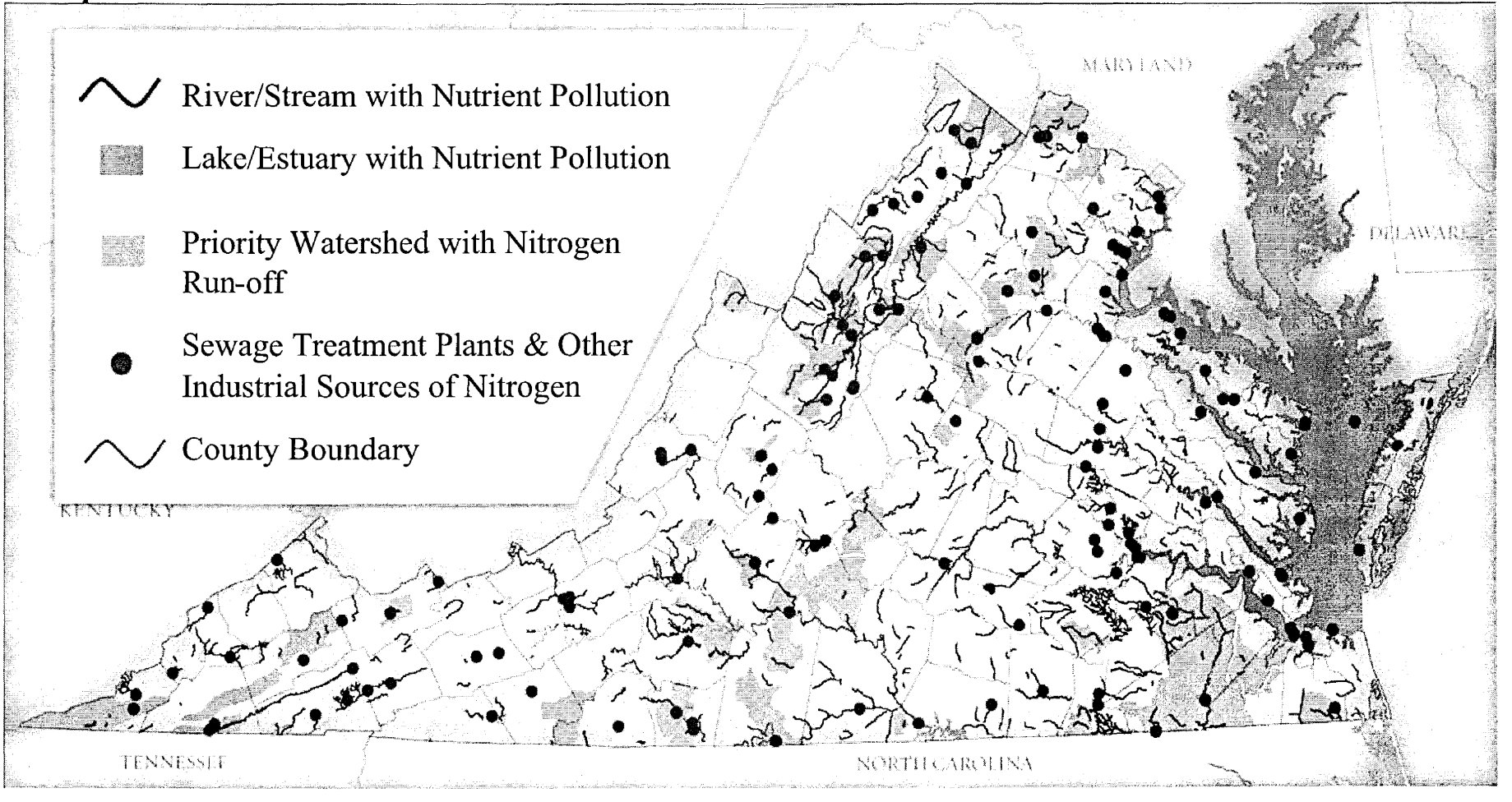
- The WQIF is the primary vehicle that has been used to provide general fund support for water quality initiatives
- Created by the 1997 Session of the General Assembly, the WQIF has, until recently, relied upon two sources of funding:
  - 10 percent of any year-end revenue surplus
  - 10 percent of any year-end unreserved general fund balance
- This funding is used to provide grants to local governments, soil and water conservation districts, state agencies, and individuals for point and nonpoint source pollution control activities
  - For Point source control funds can only be used for payment of the capital costs for improving wastewater treatment. Prior to this session, the percentage paid for was 50 percent. Passage of HB 2777, SB 1235, and SB 810 has changed this percentage to a sliding scale.
  - In the Nonpoint source area, funds can be used to purchase conservation easements, implement nutrient management plans, instruction on nutrient management techniques, pay cost share practices, and reimburse localities for water quality related tax incentives

Funding for the Water Quality Improvement Fund

- No deposits were made between FY 2002 and FY 2004 because there were no year-end surpluses or balances
- $15 million in additional general fund deposits were appropriated for FY 2005 and FY 2006
  - Represents first non-surplus appropriation to WQIF
- New language requires 15 percent of any surplus to be reserved for economic downturns
- FY 2006 includes $32.4 million from the FY 2004 surplus and $50 million committed for improving wastewater treatment

Fiscal Year	Surplus Deposits	GF Deposits
1998	$10.0	$0
1999	$37.1	$0
2000	$25.2	$0
2001	$10.3	$0
2002	$0	$0
2003	$0	$0
2004	$0	$0
2005	$7.7	$15.0
2006	$32.4	$65.0

Virginia Waterways Affected by Nutrient Pollution



Remarks to the House Joint Resolution 640 Committee
W. Tayloe Murphy, Jr.
May 12, 2005
General Assembly Building, House Room C

Mr. Chairman and members of the Committee:

It is my pleasure to be with you today to offer my perspective on the issues raised by House Joint Resolution 640. I would like first to commend Delegate Callahan for introducing HJR 640 that raises important issues regarding the funding of our water quality programs and for each of your efforts during the recent General Assembly session. The work you have done and the work you will do over the coming months, and the recommendations you will make as a result of this study will determine whether we will have clean water and healthy habitat in this Commonwealth. You will choose and recommend the best method to meet both the commitments we have made under the Chesapeake 2000 Agreement and the legal obligations imposed by the Clean Water Act and under Virginia law.

Through scientific research, monitoring and modeling, we know what to do to restore water quality and in large measure, we know how to do it. All that we lack are the financial resources to get the job done. This is particularly true in the case of nonpoint source programs that are for the most part based on financial incentives. Without sufficient funding, we will not achieve the necessary water quality improvements and I would not be surprised if EPA moves to impose greater regulatory responsibilities on nonpoint sources if we fail to meet water quality standards.

I am particularly pleased that this committee is looking at water quality issues on a statewide basis. The problems facing the Chesapeake Bay are well known and my office and the agencies within my secretariat, in concert with EPA, the other 5 bay states and the District of Columbia have spent a good deal of time developing strategies to address these problems. Despite our collective efforts, we still have significant water quality problems throughout the state, as evidenced by the water body listings for which we are required to prepare TMDLs under section 303(d) of the Clean Water Act.

As you know, I have long advocated additional support for our natural resource programs. Our total budgetary support for all of the natural and historic resources agencies has historically hovered at or below 1% of the state budget. You also know that Virginia ranks at or near the bottom, depending which measure one uses, in natural resource spending among the states. In many ways, we are suffering now from our previous inaction and now we must work diligently to install agricultural and stormwater practices, upgrade sewage treatment plants, conserve land and undertake a variety of other activities that would have been done in the past if we had had the resources to do them.

HJR 640 directly recognizes our plight by stating that reliance on a portion of the surplus as the sole source of funding for the "Water Quality Improvement Fund" leads to allocations that are "inadequate and inconsistent". Although I would say that even with the funding shortcomings, we have made some progress since the adoption of the WQIA in 1997, particularly in the Potomac watershed.

It is clear to me that during the past year we have made substantial progress in meeting our water quality objectives. The recently concluded General Assembly session did much more than increase funding for our programs. With the adoption of the amendments to the Water Quality Improvement Act and the Nutrient Credit Trading bill, combined with the regulatory initiatives that have been adopted or are under development, we have built the foundation upon which we can construct an effective nutrient control program that will be second to none. In terms of funding, the "down payment" on the implementation of our tributary strategies made during the last session was an important step forward and I trust this positive momentum will continue in future bienniums.

Before I ask my Assistant Secretary Russ Baxter to give you an overview of the cost estimates that have been developed by our agencies for both the tributary strategies and for the other TDMLs we are obliged to complete, I would like to provide some perspective on the task at hand and review the work of this administration regarding funding needs and funding sources.

First, I will briefly review the water quality actions we have taken pursuant to the commitments contained in the Chesapeake 2000 Agreement.

Despite our efforts at nutrient reduction after 1987, in 1999 the Environmental Protection Agency added the Chesapeake Bay and its tidal tributaries to its list of "impaired waters" because excessive amounts of nitrogen and phosphorous were causing violations of water quality standards. In response to this action the signatories to the current bay agreement set forth a process to remove the Bay and its tidal tributaries from the EPA "impaired" waters list. EPA, with the advice and guidance of the states and the public, has established criteria for the development of new water quality standards for the Bay and its tidal tributaries. These criteria have been established for dissolved oxygen, chlorophyll "a", an indicator of the amount of algae in our waters, and water clarity. They set the stage for determining the nutrient and sediment reductions necessary to meet the new standards and thereby restore water quality with the result being more oxygen, more underwater grasses and more productive fisheries. The nutrient reduction goals, agreed to by the six watershed states and the District of Columbia in March of 2003, and endorsed by Governor Warner and his counterparts on the Chesapeake Executive Council, in December of 2003, have been allocated to the major river basins within the Chesapeake Bay watershed. In Virginia, these basins are the Potomac (which includes the Shenandoah), the Rappahannock, the York, the James and the bayside creeks of the Eastern Shore.

Since the allocations were made, we have undertaken the process of refining our tributary strategies to determine the extent of the nonpoint land-based practices and the levels of wastewater treatment that are necessary to achieve the Commonwealth's reduction goals.

When the Chesapeake Bay was placed on the impaired waters list, we entered a new era in the regulation and management of nutrients. The reductions we are now obliged to achieve establish the maximum amount of nitrogen, phosphorus and sediment that can be safely discharged into the Chesapeake Bay and its tidal tributaries from all sources. Once these reductions are made, we will need to maintain a cap in the face of an ever increasing population, additional treatment plant flows and a changing landscape.

The programs that we are working hard to put in place recognize this new and very challenging environment. We must learn to live under a cap; however, I do not think that there is a full appreciation of the implications of this reality. To meet our obligations under the 2000 Agreement will mean that new and expanded efforts will be necessary. It means that the measures we put in place now, and in the future, must be operated and maintained so that we can achieve our reduction goals and thereafter remain under our cap loads.

As I said, our Tributary Strategies allocate the total caps on nitrogen and phosphorous between point sources and non-point sources that can flow into the Chesapeake Bay from all sources. In order to achieve our point source goals, the Department of Environmental Quality has prepared three separate regulations dealing with the establishment of new and expanded water quality standards, the placement of numerical limits on nutrient discharges in wastewater permits, and the allocation of the total point source cap among the Commonwealth's significant dischargers. The State Water Control Board has already approved substantially all of the standards regulation and the Board should act on the remaining proposals before the end of this year. The 2005 General Assembly adopted legislation that has been signed by the Governor that will authorize the issuance of a watershed general permit and provide for trading within watersheds. In an unprecedented move, the Environmental Protection Agency has appeared at several public hearings to support these regulatory initiatives prior to their adoption. It has also indicated its general support for the companion legislation that will take effect on July 1st of this year.

In order to assist localities in the implementation of these regulations, DEQ will receive approximately $67 million in the next fiscal year to provide cost share grants to help offset the financial strain on localities.

On the non-point source side of the ledger, the Tributary Strategies set forth the nutrient management practices that when fully implemented on the ground, will achieve the reductions necessary to reach that portion of our total nutrient caps allocated to non-point programs. The Department of Conservation and Recreation will have about $30 million in the second year of this biennium to make grants that will promote non-point reductions in both nutrients and sediments. Although this is a significant amount of money, much more will be needed in the years to come.

While we will spend time talking about how much things cost, we must also recognize that there is a cost associated with inaction.

When I am at home in the Northern Neck it deeply saddens me to ride by one abandoned oyster shucking house after another – by lifeless crab picking facilities that today stand empty – all monuments to a once thriving commercial seafood industry that no longer exists because we placed on that industry the cost of our failure to keep its workplace clean and healthy. The economic losses experienced in areas like the Northern Neck can be seen there every morning, simply by observing the number of sons and daughters of watermen who now commute to Northern Virginia and other urbanized communities to find work. They make these daily trips not as a matter of choice, but as a matter of necessity. They no longer have the option of fishing productive waters in their own backyard.

The seafood industry is but one example that supports the proposition that the economic health of this Commonwealth is dependent upon the health of its natural resources. Other examples are, quite obviously recreational fisheries, tourism, forestry, and agriculture. We must constantly challenge the notion that natural resource conservation is a luxury that we can only afford to support in good financial times.

In economic development circles, one often hears that "quality of life" is an important factor in economic growth; therefore, we must unfailingly press the case that healthy natural and cultural resources are at the heart of that illusive term. Each of us benefits from clean water, clean air, protected open space, and preserved historic sites and buildings, often in ways we do not fully recognize or appreciate. While I have never been an advocate of making strict dollar assessments of environmental action, it seems clear to me that we must better understand and account for the value of our natural resources in economic terms.

Let me now give you an overview of the work this administration has done regarding funding our natural resource conservation programs.

As you may recall, during the 2002 reconvened session, Governor Warner unsuccessfully proposed a tipping fee with the proceeds to benefit waste, land and water programs.

Addressing funding for natural resource programs continued in earnest with the convening of the Governor's Natural Resources Leadership Summit in Williamsburg in April of 2003. Business leaders, conservationists, farmers, foresters, developers and government officials gathered to identify the key issues facing Virginia's natural resources. The overwhelming consensus was that lack of funding was the single biggest obstacle that needed to be overcome.

As a result of the deliberations at the summit, the Governor created the Natural Resources Funding Commission that met over the summer of 2003 and presented it's report on October 9, 2003. The commission was composed of a cross section of individuals who had participated in the summit. A copy of the report has been provided to each of you.

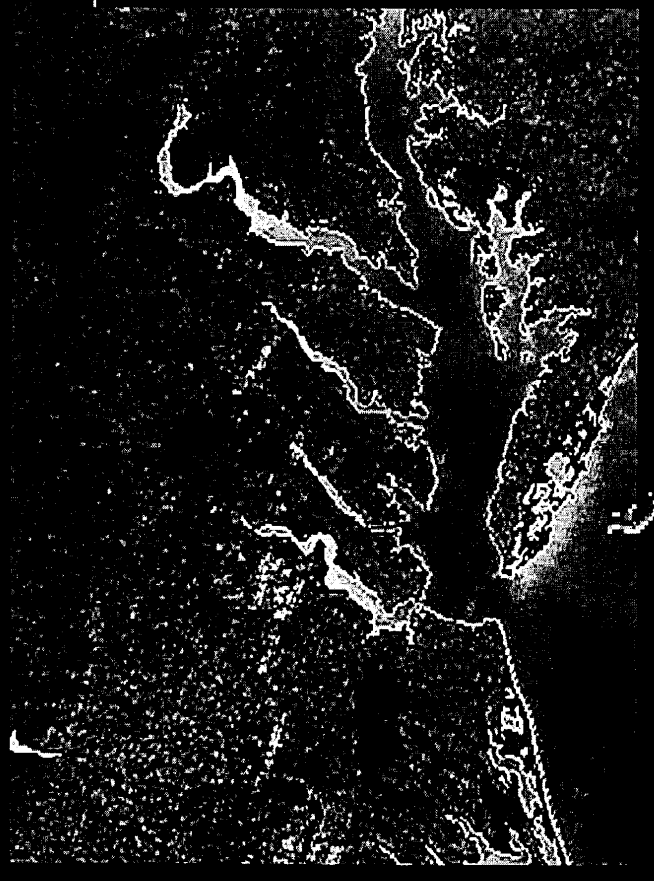
The commission was unequivocal in its conclusion that without additional funding, we would fall short in our constitutional obligation to conserve our natural resources. The report stated "the commission expressed unanimous support for increases in both general and non-general fund expenditures for natural resources, with an emphasis on improving funding for land conservation and water quality improvement in the Commonwealth."

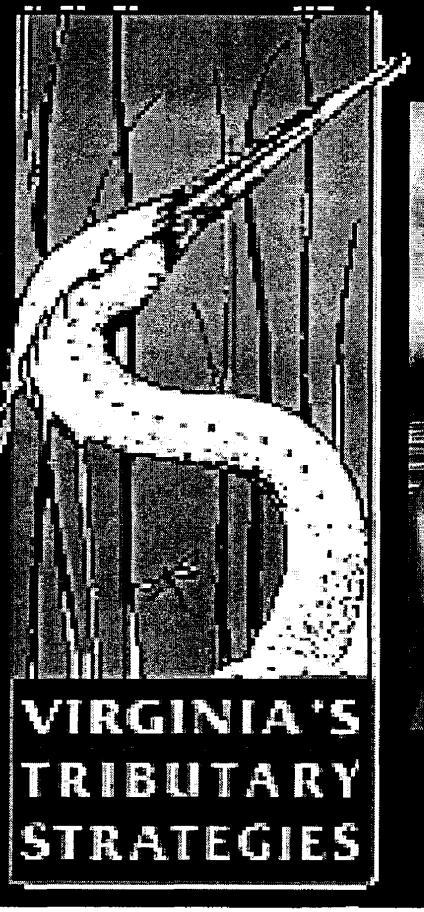
Regarding non-general funds, the commission identified a series a non-general fund options and estimated the revenue that would be garnered by each. While the commission did not reach unanimous agreement on any single non general fund source, the majority of the members saw a need to provide a dedicated and reliable source of funding. I commend the report to you and your staff for further review and analysis over the course of this study.

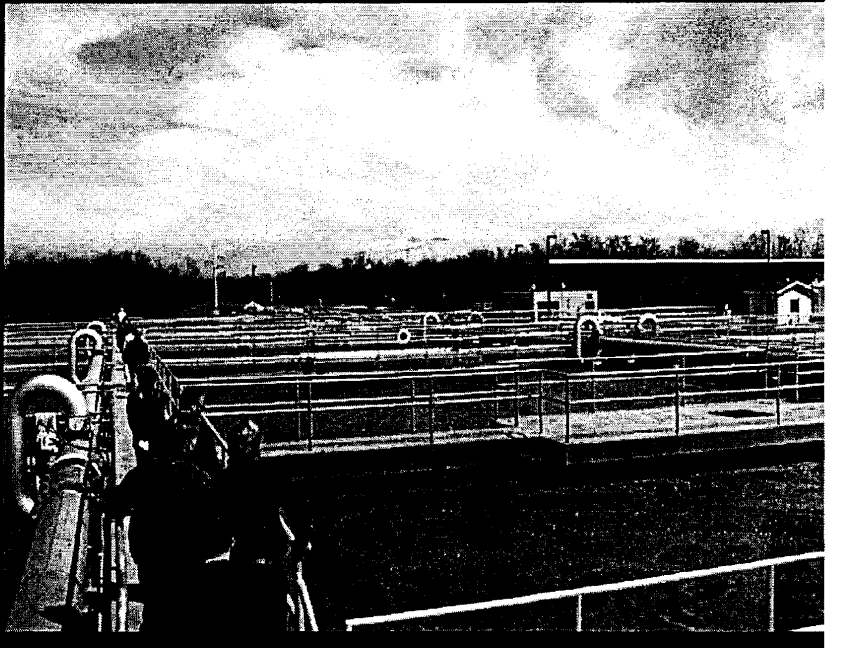
I will now ask Russ Baxter to give an overview of the cost estimates that we have developed for the bay and other TMDLs and then I would be happy to answer any questions that you may have.

Virginia's Water Quality Programs: Overview of Status and Costs

Russ Baxter, Assistant Secretary of Natural Resources





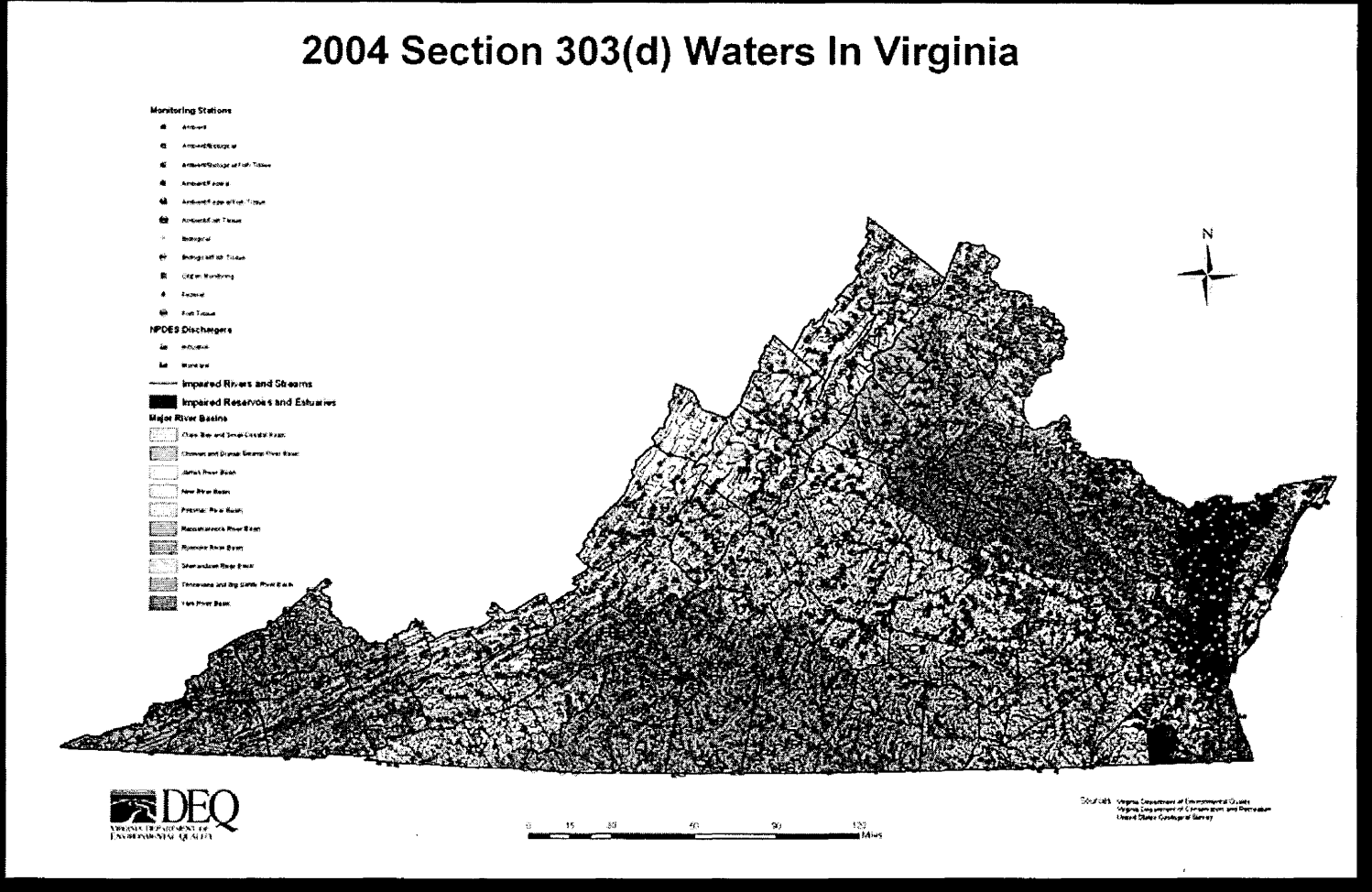


APPENDIX D

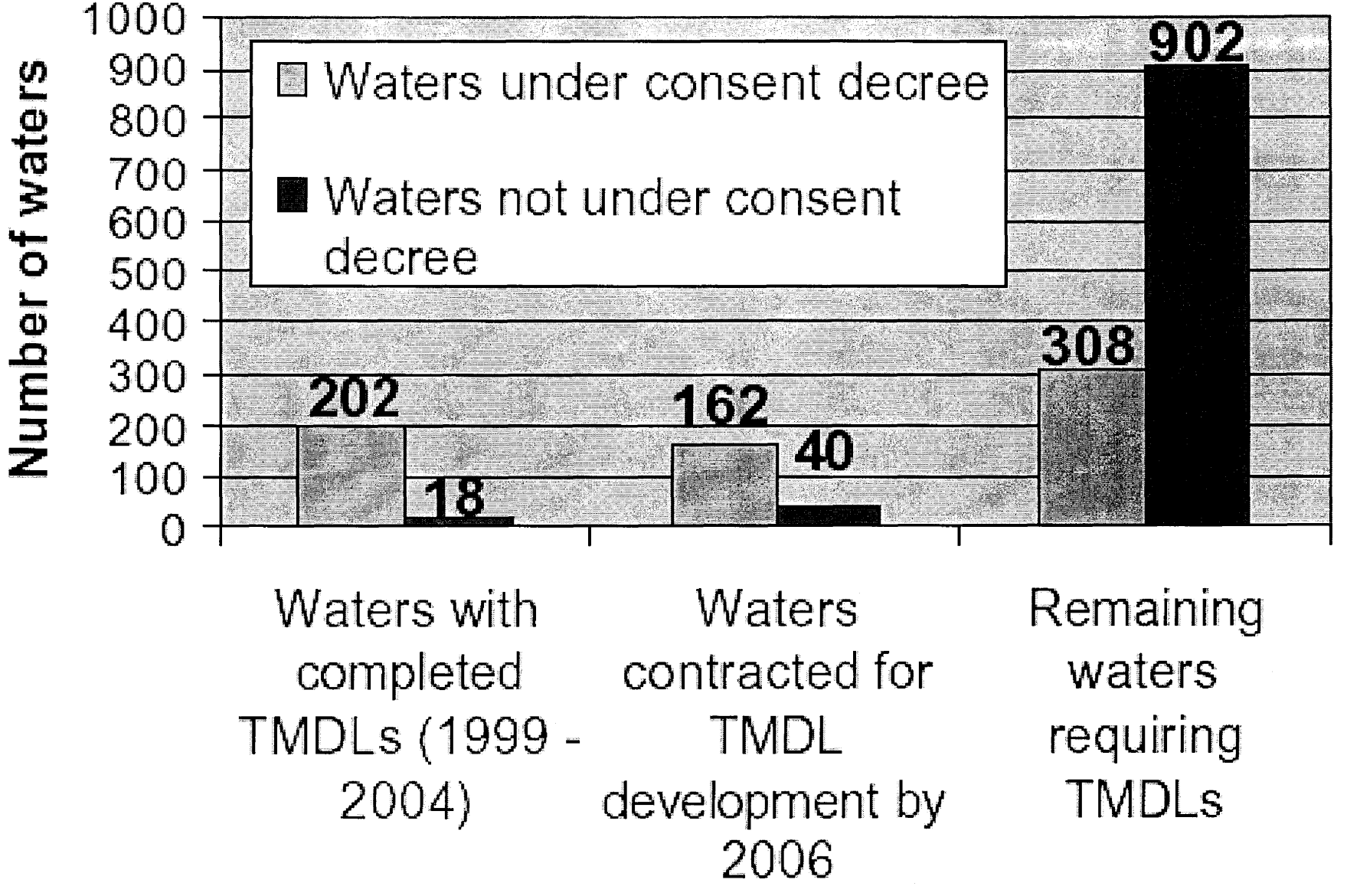
Status of Virginia Waters

- 2004 Water Quality Assessment Results
  - 6,900 stream miles impaired [out of 13,200 miles assessed]
  - 89,900 acres of lakes impaired [out of 109,000 acres assessed]
  - 1,810 square miles of estuaries impaired [out of 2,500 square miles assessed]
- Bacteria, nutrients, sediments, toxics, pH and natural conditions contribute to these impairments

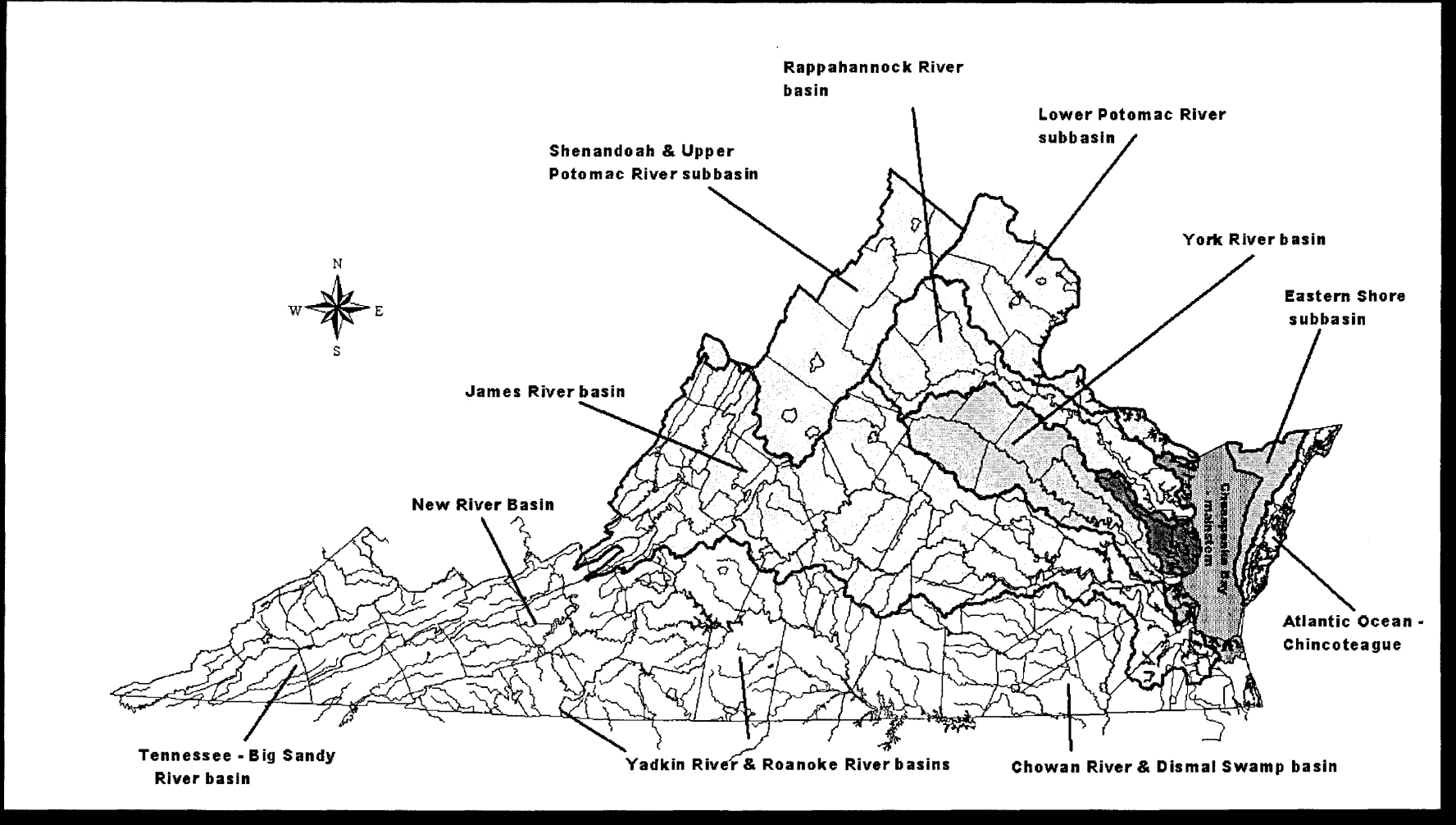
Impaired Waters in Virginia



Status of TMDL development for impaired waters



Virginia Tributary Strategy River Basins



Legislative Actions

Chesapeake Bay Nutrient Credit Exchange Program

(HB 2862 / SB 1275)

- SWCB to issue "Watershed General Permit" containing nutrient waste load allocations for each significant discharger
- Allows trading within basins among facilities covered by WGP
- Authorizes establishment of "Nutrient Credit Exchange Association"

WQIA Amendments

HB 2777 SB 1235 SB 810

- Updates Act ("C2K" and "tributary strategy plans")
- Statement of Policy "It shall be the be the policy of the General Assembly to provide annual its share of support …."
- Requires DEQ to sign grant agreements with significant dischargers

WQIA Amendments (con't)

- "Sliding Scale" for point source grants from 35% to 75% based on a ratio
- Additional "priorities" – Agricultural Practices, Pounds of Reduction

Status of Regulatory Actions

New water quality standards:

- Chesapeake Bay standards adopted by SWCB in March 2005
- Special standards for tidal James and York rivers will be considered in June 2005
- Process underway for adopting nutrient criteria for lakes/reservoirs and freshwater streams/rivers

Status of Regulatory Actions

New regulations for Chesapeake Bay dischargers

- **Water Quality Management Planning Regulation** – sets nutrient waste load allocations
- **Regulation for Nutrient Dischargers** – sets technology-based nutrient concentration limits for certain discharges

  -SWCB action expected this summer

- **Watershed General Permit** – authorizes discharge of nutrients from all dischargers

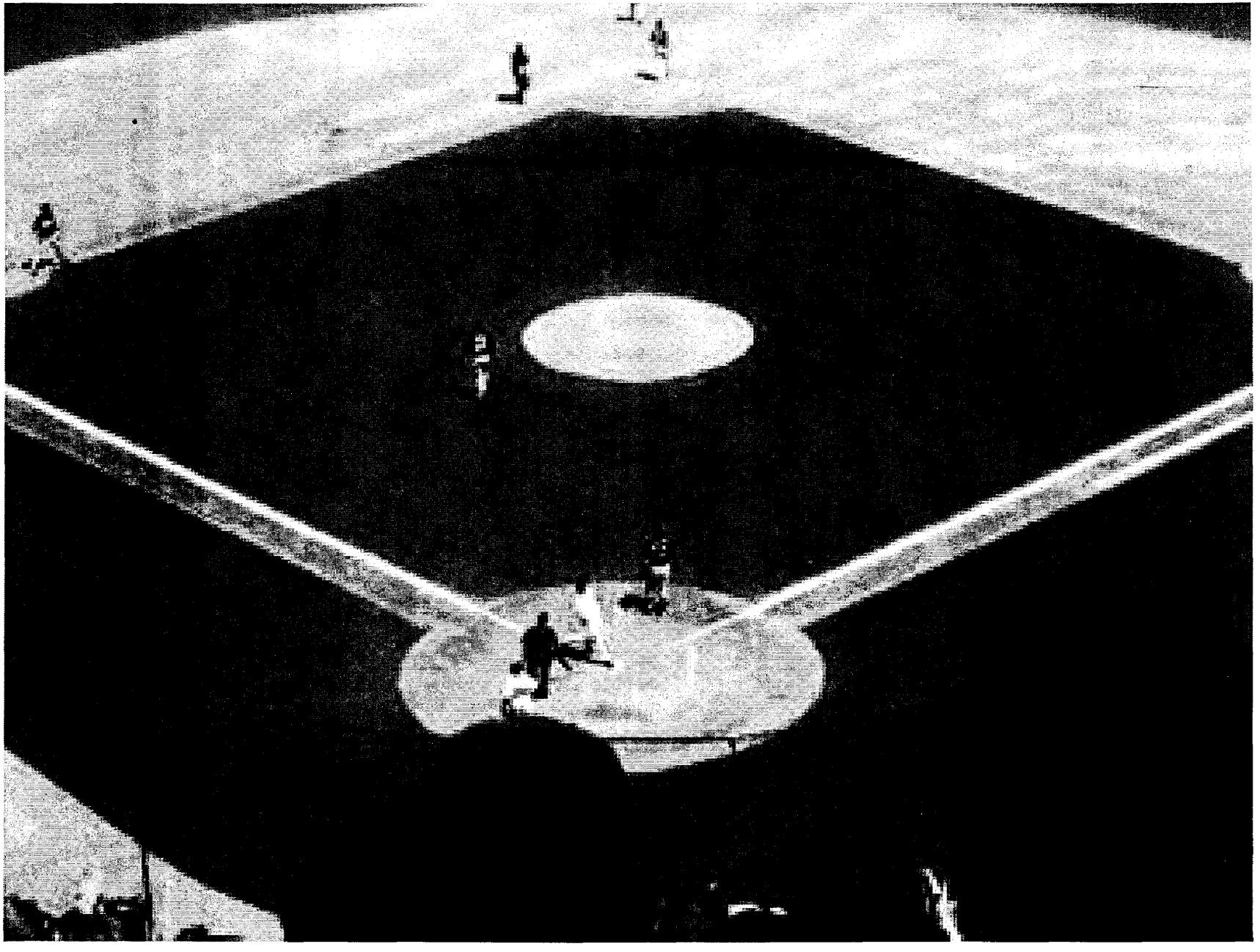
  -SWCB action by early 2006

"Evolution" of Cost Estimates

- Initial cost estimates developed for the Chesapeake Bay Program (CBP). These estimates served as the basis for the initial Virginia estimate of $3.2 billion and Blue Ribbon Panel.
- Point Source Cost estimates remain the same
- Nonpoint estimates used CBP as a starting point adjusted estimates using program experience and best professional judgment by DCR

"Evolution" of Costs Estimates (con't)

- The Blue Ribbon Panel aggregated costs prior to the completion of the analysis and used a best guess.
- The numbers we have developed are the last estimates we will do. We will focus now on actual costs and budgets.
- The estimates presented here will change as program implementation continues.



Cost Estimates – Point Sources*

Capital and O&M cost estimates for significant dischargers to meet nutrient reduction commitments:

VA River Basins	Number of Wastewater Treatment Plants	Total Capital Cost Point Sources [$ Millions]	Annual O&M Cost Point Source [$ Millions/year]
Potomac	43	476	23
Rappahannock	22	92	2
York	11	30	1
James	39	487	15
Eastern Shore	5	14	1
VA Total	120	1,099	42

*NOTE: capital cost figures are planning level, order-of-magnitude cost opinions, accurate from -30% to +50%

Funding Analysis - Needs

- Total point source capital need: $1.099 B
  - for all 120 treatment plants
- POTW capital cost need: $1.014 B
  - for 100 publicly owned plants
- Variables:
  - These are cost estimates: could be higher or lower
  - Not all POTWs may need, or decide, to upgrade prior to 2010; for 20 POTWs with existing nutrient removal, the need to upgrade depends upon current flow, rate of growth and nutrient removal efficiency at existing facility

Funds for FY06
WQIF

- Deposit into VA Water Quality Improvement Fund for FY06
  - Point sources: $65.7 million*
  - Non-point sources: $26.8 million*
- PS grants range from 35% to 75% based on financial need of community
- NPS grants 60% bay watershed, 40% southern rivers

* Total funds less reserve

Estimated NPS Costs

	State $ Costs	Other $ Costs*	Total
Agriculture	$624 M	$235 M	$859 M
Urban	$290 M	$7,229M	$7,519 M
Mixed Open	$381 M	$13 M	$394 M
Forest	$0	$2.3 M	$2.3 M
Septic	$4 M	$78 M	$82 M
Total	$1,300 M	$7,557 M	$8,857M

* Includes regulatory requirements, local government and landowner costs.

"State Costs" vs "Other Costs"

- "State Costs" are those cost that would be reasonably borne by the Commonwealth based on existing programs and past practice.
- "Other Costs" include private/local share of state cost share programs, regulatory requirements, voluntary efforts, etc.

TMDL Costs

- Plan Development: between $7,000 and $16,500 per impaired segment.
- Implementation: Range from $330,000 to $1 million per mile (estimates based on existing TMDLs for bacteria and sediment on free-flowing streams). Could be much higher for other impairments (e.g. PCBs, sewer upgrades, mining and others)

TMDL and Ches Bay TS Costs

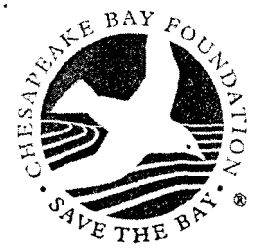
TMDL (Bay non TS) =		$4.2 billion
TMDL (Non Bay)	=	$1 billion
TS $8.8 billion x .07* =		$6.2 billion
TS Point Source =		$1.1 billion
Total		$12.5 billion**

* Estimated 30% cost efficiency

** Total cost, we have not yet done "state cost " analysis

Current Events

- Secretary is required by Code to issue guidance for WQIF grants
- Secretary must convene Advisory Committee and have 60 day comment period
- Advisory Committee met on 5/5/05, Public Comment period to begin with publication of next VA Register.



CHESAPEAKE BAY FOUNDATION

Environmental Protection and Restoration
Environmental Education

HJR 640 FUNDING STUDY COMMITTEE
MAY 12, 2005

STATEMENT OF THE CHESAPEAKE BAY FOUNDATION

GOOD MORNING (AFTERNOON) MR. CHAIRMAN AND MEMBERS OF THE STUDY COMMITTEE. I AM ANN JENNINGS, VIRGINIA EXECUTIVE DIRECTOR OF THE CHESAPEAKE BAY FOUNDATION.

IT IS A PLEASURE TO SPEAK TO YOU TODAY AS YOU BEGIN CONSIDERING HOW TO PERMANENTLY FUND THE CLEAN UP OF VIRGINIA'S RIVERS, STREAMS AND THE BAY.

I FIRST WANT TO TAKE THIS OPPORTUNITY TO PERSONALLY SAY "THANK YOU" FOR YOUR WORK DURING THE 2005 SESSION. I HOPE THAT YOU SAW OUR PUBLIC "THANK YOU" IN THE RICHMOND TIMES DISPATCH ON THE DAY OF THE RECONVENED SESSION, APRIL 6TH.

THE CHESAPEAKE BAY FOUNDATION REMAINS GRATEFUL FOR YOUR LEADERSHIP ON THIS CRITICAL AND PRESSING MATTER.

WE APPRECIATE YOUR DEDICATION OF A 50 MILLION DOLLAR DOWNPAYMENT TO UPGRADE SEWAGE TREATMENT PLANTS TO SIGNIFICANTLY REDUCE NUTRIENT POLLUTION, THE NUMBER ONE THREAT TO THE HEALTH OF THE CHESAPEAKE BAY.

WE ARE ALSO GRATEFUL FOR THE CONTINUED LEADERSHIP OF SECRETARY MURPHY AND SECRETARY BLOXOM, WHO HAVE MAINTAINED A HIGH LEVEL OF ATTENTION AND DEDICATION TO VIRGINIA'S WATER QUALITY NEEDS.

CBF STRONGLY SUPPORTS THE CONCLUSION OF HOUSE AND SENATE LEADERS, WHO DURING THE 2005 SESSION DECLARED THAT CLEAN WATER IS NOT A OPTION BUT AN OBLIGATION AND THAT FUNDING FOR NATURAL RESOURCES IS A CORE FUNCTION OF GOVERNMENT.

AS YOU WELL KNOW AND AS SECRETARY MURPHY AND RUSS BAXTER CLEARLY LAID OUT EARLIER THIS MORNING, THERE ARE A NUMBER OF LEGAL REASONS WHY VIRGINIA IS OBLIGATED TO RESTORING OUR LAKES, STREAMS, RIVERS AND THE BAY – FROM CONSENT ORDERS OUTLINING COMPLIANCE WITH FEDERAL LAW, TO SEVERAL STATE LAWS, AND THE COMMONWEALTH'S COMMITMENT UNDER THE CHESAPEAKE 2000 AGREEMENT.

BUT CERTAINLY THERE ARE OTHER IMPORTANT, PERHAPS MORE COMPELLING REASONS FOR PROVIDING CLEAN WATER – TO PROTECT THE QUALITY OF LIFE AND HEALTH OF OUR CITIZENS, TO MAINTAIN THE STATE'S DIVERSE AND VIBRANT ECONOMY, TO SECURE A LEGACY OF CLEAN WATER FOR OUR CHILDREN AND OUR GRANDCHILDREN. THIS WILL NOT BE AN EASY OR INEXPENSIVE TASK. BUT GIVEN WHAT IS AT STAKE, I URGE YOU TO FIND A SOLUTION. FAILURE TO REACH A CONSENSUS, I HOPE, IS NOT AN OPTION.

MY MESSAGE TO YOU TODAY IS QUITE SIMPLE. AS YOU WORK TO FIND WAYS TO FUND RESTORATION OF THE CHESAPEAKE BAY AND VIRGINIA'S STREAMS AND RIVERS, YOU HAVE CBF'S SUPPORT AND THE SUPPORT OF VIRGINIANS ACROSS THE STATE -- FROM RURAL SHENANDOAH VALLEY, TO THE URBAN CRESCENT, TO THE EASTERN SHORE.

WHY CAN I SAY THAT SO CONFIDENTLY? CBF HAS TALKED AND WORKED WITH LITERALLY THOUSANDS OF VIRGINIANS OVER THE PAST YEAR – FIVE HUNDRED OF WHOM RALLIED AT THE CAPITOL LAST JANUARY IN SUPPORT OF FUNDING FOR CLEAN WATER. THOSE CONVERSATIONS OFFER A NUMBER OF "GUIDING PRINCIPLES" I HOPE YOU WILL CONSIDER AS YOU MOVE FORWARD.

WE KNOW THAT CITIZENS ACROSS THE COMMONWEALTH CONSIDER POLLUTION OF THE CHESAPEAKE BAY AND LOCAL RIVERS AND STREAMS A VERY SERIOUS PROBLEM, ONE THEY ARE MORE CONCERNED ABOUT THAN THE ECONOMY, CRIME, EDUCATION, AND TAXES. VIRGINIANS, OVERWHELMINGLY, SUPPORT YOUR ACTION LAST SESSION TO APPROPRIATE 50 MILLION DOLLARS TO REDUCE POLLUTION IN RIVERS, STREAMS AND THE CHESAPEAKE BAY.

VIRGINIANS ACCEPT THAT WE ARE ALL PART OF THE PROBLEM AND MUST BE PART OF THE SOLUTION. VIRGINIAN'S CAN ACCEPT PAYING THEIR SHARE OF THE BILL FOR BRINGING THE CHESAPEAKE BAY AND VIRGINIA'S RIVERS BACK TO HEALTH.

SOME OTHER KEY FINDINGS CBF HAS IDENTIFIED IN TALKING TO VIRGINIANS:

- THERE IS GENUINE EXCITEMENT AND ENERGY THAT WE HAVE IDENTIFIED THE PROBLEM, DEVELOPED SOLUTIONS, AND, IF IMPLEMENTED, WE CAN BRING THE BAY BACK. VIRGINIAN'S ARE WILLING TO PAY IF THE FUNDING GOES TO IDENTIFIED SOLUTIONS THAT WORK. VIRGINIANS WANT TO KNOW THAT THE FUNDING IS GOING TO "ON-THE-GROUND" SOLUTIONS THAT WILL DIRECTLY RESULT IN WATER QUALITY IMPROVEMENTS.

- WE LEARNED THERE IS A PRESSING NEED FOR A STABLE, CONSISTENT FUNDING SOURCE. WHILE THE WATER QUALITY IMPROVEMENT FUND HAS BEEN OUR CRITICAL LINK TO THE PROGRESS MADE THUS FAR, THE INSTABILITY OF THE FUND – ONE YEAR THERE ARE TENS OF MILLIONS OF DOLLARS AVAILABLE AND THE NEXT YEAR THERE IS NOTHING – HANDICAPS THE COMMONWEALTH'S EFFORTS BEYOND JUST A LACK OF FUNDS. WITHOUT A STABLE SOURCE OF FUNDING, LOCAL GOVERNMENTS AND FARMERS CANNOT ADEQUATELY PLAN FOR THEIR CONSTRUCTION NEEDS – TO UPGRADE SEWAGE TREATMENT PLANTS OR INSTALL BEST MANAGEMENT PRACTICES. WE OFTEN HEARD THAT FARMERS GAVE UP TRYING TO SECURE STATE FUNDING FOR CONSERVATION PRACTICES, HAVING REPEATEDLY APPLIED AND BEEN TURNED AWAY DUE TO LACK OF FUNDS. IT IS SIMPLY NOT ACCEPTABLE TO HAVE VIRGINIA'S FARMERS WILLING TO TAKE ACTION ON THEIR LAND TO ADDRESS RUNOFF PROBLEMS – FARMERS WILLING TO DO THEIR PART -- YET HAVE INSUFFICIENT STATE FUNDS TO ASSIST IN THAT EFFORT.

- THERE IS ALSO SUPPORT FOR TARGETING SOLUTIONS THAT PROVIDE THE "BIGGEST BANG FOR THE BUCK." BY TAKING SUCH AN APPROACH, WE CAN REAP THE BENEFITS OF CLEAN WATER SOONER RATHER THAN LATER. AND, AS DELEGATE LIGAMFELTER – A MEMBER OF THE CHESAPEAKE BAY COMMISSION -- IS AWARE, WE KNOW WHAT WILL GET US THE GREATEST IMPROVEMENTS FOR THE LEAST FUNDING. THE CHESAPEAKE BAY COMMISSION'S REPORT ON COST-EFFECTIVE STRATEGIES FOR REDUCING NUTRIENT POLLUTION CLEARLY LAYS OUT THE BEST PRACTICES.

- WE ALSO HEARD LOUD AND CLEAR THAT IF A FEE IS ESTABLISHED, EXEMPTIONS SHOULD BE PROVIDED FOR LOW-INCOME HOUSEHOLDS AND THAT THE COLLECTION OF ANY NEW FEE SHOULD BE AS SIMPLE AS POSSIBLE.

I HAVE NO DOUBT THAT YOU WILL WRESTLE WITH A NUMBER OF DIFFICULT ISSUES IN THE COMING MONTHS AS YOU WORK TO DEVELOP A LONG-TERM FUNDING SOLUTION TO VIRGINIA'S WATER POLLUTION CRISIS. I HOPE THESE FEW LESSONS WE HAVE LEARNED WILL ASSIST YOU IN THAT REGARD.

IF THIS COMMITTEE CAN AGREE UPON ONE OR MORE APPROACHES THAT WILL PREDICTABLY, YEAR AFTER YEAR, PROVIDE THE NECESSARY FUNDING – PERHAPS, HUNDREDS OF MILLIONS OF DOLLARS – TO FUND VIRGINIA'S CLEAN UP PLANS, THE COMMONWEALTH WILL, WITHOUT DOUBT, BE A LEADER IN THE BAY REGION, AND ACROSS THE NATION, IN RESTORING OUR WATERS.

IN CLOSING, I OFFER ANY ASSISTANCE THAT THE CHESAPEAKE BAY FOUNDATION CAN PROVIDE TO THE STUDY COMMITTEE. WE ALREADY HAVE EXTENDED TO DELEGATE CALLAHAN AN OFFER FOR THE STUDY COMMITTEE TO MEET AT THE BAY FOUNDATION'S PORT ISOBEL ISLAND EDUCATION CENTER, LOCATED NEAR TANGIER ISLAND IN THE MIDDLE OF THE CHESAPEAKE BAY. WE HAVE ALL THE AMENITIES NECESSARY TO HOST THIS COMMITTEE AND OTHER ATTENDEES FOR AN OVERNIGHT STAY. AS I BELIEVE DELEGATE COX CAN ATTEST, PORT ISOBEL PROVIDES BREATH-TAKING VIEWS IN A RELAXED AND COMFORTABLE SETTING – A PERFECT LOCATION TO HOLD A MEETING.

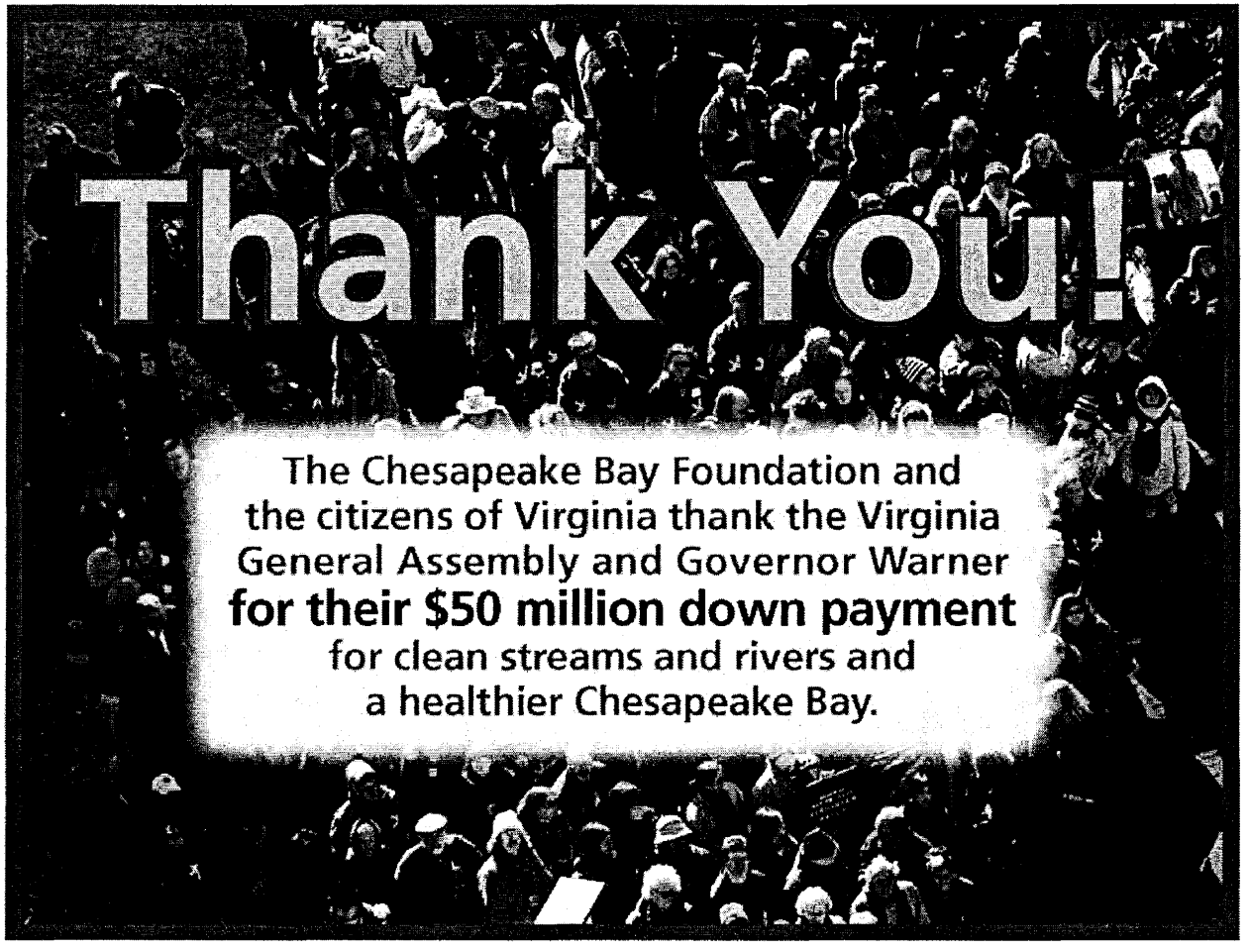
WE WILL ALSO HAVE A NUMBER OF OUR STAFF WORKING ON THE FUNDING ISSUE OVER THE COMING YEAR AND WE HAVE AGAIN RETAINED THE SERVICES OF MAY FOX AND CHARLIE GUTHRIDGE IS ASSIST US IN THIS EFFORT. PLEASE FEEL FREE TO CALL ON ANY OF US FOR ASSISTANCE.

I THANK YOU FOR THIS OPPORTUNITY. I AGAIN THANK YOU FOR YOUR COMMITMENT TO THIS ISSUE. AND, I LOOK FORWARD TO WORKING WITH YOU.

VIRGINIA CITIZENS COMMIT TO CLEAN WATER FUNDING

Ann F. Jennings
Virginia Executive Director
Chesapeake Bay Foundation

May 12, 2005



These citizens were among 500 people who marched to the State Capitol on January 17, 2005, to voice support for state funding for clean water and land conservation.

CHESAPEAKE BAY FOUNDATION
Save the Bay

Photo by Bill Portlock.

"Natural resource funding is a core function of government." Delegate Kirk Cox, January 31, 2005 Press Event.

"This is not an option for us. We've got to do this. If we don't do something on this, the EPA is going to come in and do it for us, and they'll send us the bill." Delegate Vincent F. Callahan, Jr., January 31, 2005 Press Event.

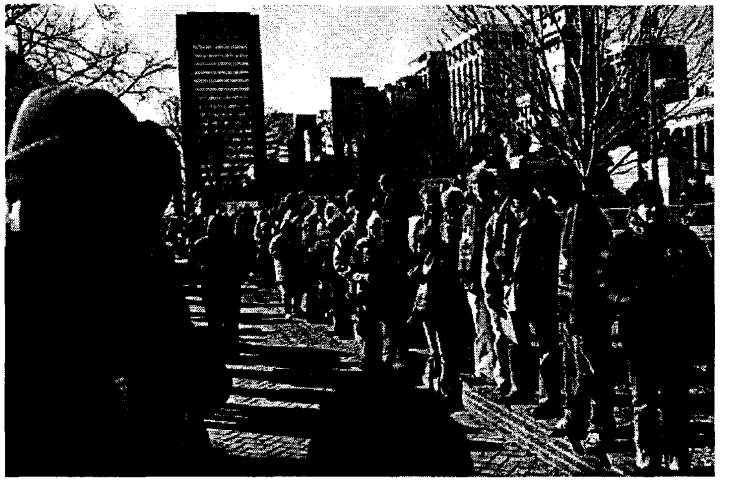
"It's [Bay restoration] an obligation we have to deal with." Senator Charles R. Hawkins, February 1, 2005, Richmond Times Dispatch.

"This is something that we are wringing our hands about, but it's really got to be done." Senator John H. Chichester, February 1, 2005, The Washington Post.

RESTORING THE WATER QUALITY OF VIRGINIA'S RIVERS, STREAMS, AND THE CHESAPEAKE BAY: A DUTY AND AN OBLIGATION

- **American Canoe Association v. Environmental Protection Agency, June 1999;**
- **Water Quality Monitoring, Information and Restoration Act, 1997;**
- **Chesapeake 2000 Agreement;**
- **Water Quality Improvement Act, 2005 amendments.**

VIRGINIAN'S LOBBY FOR CLEAN WATER FUNDING



Photos by Bill Portlock and Hank Helmen.

"GUIDING PRINCIPLES" FOR VIRGINIA'S CLEAN WATER FUNDING

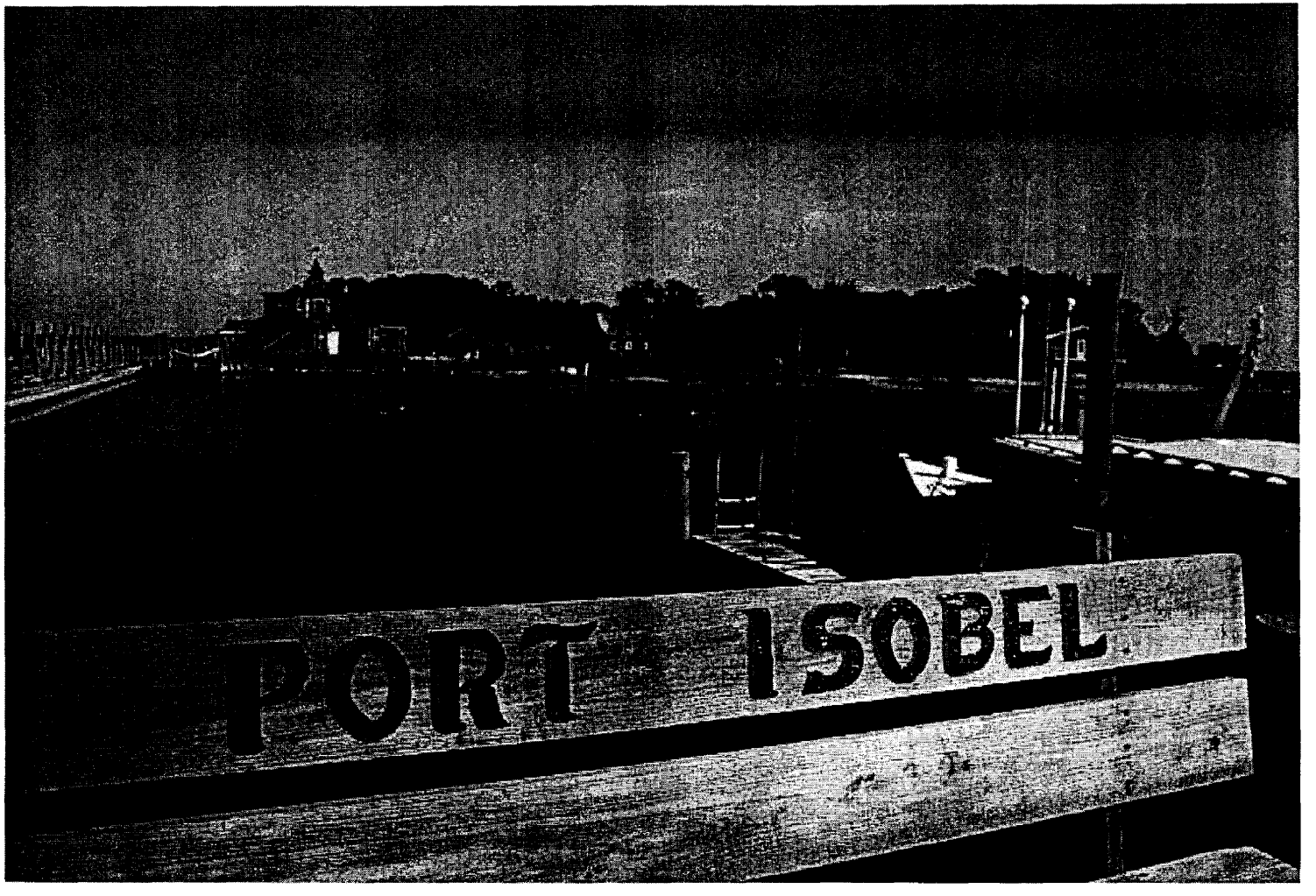
- **Virginians consider pollution of the Chesapeake Bay and local rivers and streams a very serious problem, even more so than the economy, public safety, education and taxes.**

- **Virginians support your action to appropriate $50 million to reduce pollution in rivers, streams, and the Chesapeake Bay**

- **Virginians recognize that we are all part of the problem; we should all be part of the solution. That is, we are willing to pay for the our share of the bill for bringing the Chesapeake Bay back to health.**

"GUIDING PRINCIPLES" FOR VIRGINIA'S CLEAN WATER FUNDING

- Virginia has a "road map" for restoring the Chesapeake Bay through the Tributary Strategies.
- Virginians believe that the funding should go for "on-the-ground" improvements.
- There is a pressing need for a stable and consistent funding source.
- Funding should be targeted to those solutions that provide the biggest "bang for the buck."
- Funding should provide exemptions for low-income households and should be administered simply.



Chesapeake Bay Foundation Port Isobel Island Education Center

Photo by Yuri Huta

Ann Jennings, Virginia Executive Director, 804-780-1392 ext. 301

Jeff Corbin, Virginia Deputy Director and Senior Scientist, 804-780-1392 ext. 310

Nina Luxmoore, Virginia Outreach and Training Manager, 804-780-1392 ext. 309

Chuck Epes, Virginia Communications Coordinator, 804-780-1392 ext. 311

May Fox, LeClair Ryan, 804-783-7592

Charles Guthridge, Charles M. Guthridge Associates, 804-285-4940

REPORT OF THE GOVERNOR'S NATURAL RESOURCES FUNDING COMMISSION

RECOMMENDATIONS TO ADDRESS THE CRITICAL FUNDING NEEDS OF VIRGINIA'S NATURAL RESOURCE PROGRAMS

TO THE GOVERNOR OF VIRGINIA

COMMONWEALTH OF VIRGINIA
RICHMOND
OCTOBER 9, 2003

APPENDIX 1 – Potential Funding Mechanisms Considered by the Commission

Source	Rate*	Measure	Unit	Billing	Quantity	Unit	Revenue
Water Utility Fee							
Municipal System	$1.00	Connection	Billing Cycle	Month	1,912,243	Connections	$22,946,916
Private Wells	$1.00	Well Permit	Local Tax Bill	Annual	1,000,000	Well	$1,000,000
Water Withdrawal Fee							
Consumptive use/municipal	$1.00	1000	Gallon	Annual	1307	MGD	$477,055,000
Sewer Access Fee							
Residential Connection							
Municipal System	$1.00	Connection	Billing Cycle	Month	1,700,000	Households	$20,400,000
Septic or On-Site Treatment	$1.00	Connection	County Taxes	Annual	827,400	Households	$827,400
Commercial Connection	$1.00	Connection	Billing Cycle	Month	92,000	Businesses	$1,104,000
Industrial Connection	$1.00	Connection	Billing Cycle	Month	445	Industries	$5,340
Wastewater Discharge Fee							
Permit Fees							
Industrial Permits	$1.00	1000	Gallon	Annual	2,858	MGD	$2,858,000
Municipal Permits	$1.00	1000	Gallon	Annual	1,223	MGD	$1,222,500
Discharge Fees							
Industrial Actual Discharge	$1.00	1	MGD	Daily	2,858	MGD	$1,043,170
Municipal Actual Discharge	$1.00	1	MGD	Daily	1,223	MGD	$446,213
On-Site Treatment Fees	$1.00	1	MGD	Annual	26,000	MGD	$ 9,490,000
Document Recording Fee							
Recordation tax	$0.01	$100	Recordation	Annual	$166	Billion	$16,600,000
Recorded Instruments	$1.00	Recording	Instrument	Annual	2,000,000	Recordations	$2,000,000
Tipping Fee							

Municipal Solid Waste	$1.00	1	Ton	Annual	12	Million Tons	$12,000,000
Petroleum Fee							
Gas Tax	$0.001	1	Gallon	Annual	6	Billion Gallons	$6,000,000
Fertilizer Fee							
Bulk Sale	$1.00	1	Ton	Annual	700,000	Tons	$700,000
End Use, Non Agricultural	$1.00	50	Pound Bag	Annual	1,400,000	50 Pound Bags	$1,400,000
Biosolids Fee							
Application Fee	$1.00	1	Ton	Annual	200,000	Tons	$200,000
Cell Phone Surcharge							
End User Fee	$1.00	Invoice	Billing Cycle	Monthly	3,000,000	Accounts	$36,000,000
Tobacco							
Tax on Cigarettes	$1.00	1	Pack	Annual	600	Million	$600,000,000
DMV							
Motor Vehicle Registration Fee	$1.00	Registration	Vehicle	Annual	6,000,000	Registrations	$6,000,000
Income Tax							
Exemption Surcharge	$1.00	1	Personal Exemption	Annual	6,301,945	Personal Exemptions	$6,301,945
Electric Utility Fee							
Connection Fee	$1.00	Invoice	Billing Cycle	Monthly	3,136,068	Connections	$37,632,816

*Note: To serve as a comparative example of what could be generated from each potential funding source, the rate was set at $1.00 in most cases.

Summary of the Report of the Governor's Commission on Natural Resources Funding

Presentation to the HJR 640 Committee

July 20, 2005

Russell W. Baxter

APPENDIX H

Background

- Commission formed following the Governor's Natural Resources Summit in Williamsburg in April 2003
- Responded to findings at the summit that funding was the most critical need facing Virginia's natural resource agencies
- Made report to Governor Warner on October 9, 2003

Commission Findings

- In FY 2004, less than 1% of total state appropriations devoted to natural resource agencies; 0.6% of general funds. This level of funding insufficient to meet natural resource needs
- Additional funding will result in measurable environmental improvements and positive economic activity.
- Need to address both General Fund and Non General Fund solutions
- Focus on Water Quality and Land Conservation

Recommendations: General Fund

- No further reductions in agency budgets
- General Fund support must increase
- Restoration of $22 million in FY 2005
- Additional $27 million for FY 2006
- Natural resources funding as part of Virginia's "Roadmap" for the future
- Dept of Forestry should also be considered a "natural resources" agency

Non-General Fund Recommendations

- Commission recognized that in the near term, existing General Funds were likely to be insufficient and therefore examine NGF sources.
- Commission established criteria to guide selection of NGF options including:

1. **nexus between source of funds and resource**
2. **ease of collection**
3. **breadth of applicability**
4. **amount of revenue**
5. **ease of understanding;**
6. **feasibility**

Commission "Consensus" Recommendations

Water Utility Fee $2.00 per month'
Expected Revenue: $46 million annually

Document Recording Fee $10 per document Expected Revenue: $20 million annually

Revenue to be deposited in the proposed Virginia Natural and Historic Resources Fund

Other Fees Considered
(without full consensus)

Type of Fee	Amount	Annual Revenue
Solid Waste Tipping	$3 per ton	$36 million
Petroleum	$0.006 per gallon	$36 million
Electric Utility	$2 per month	$75.2 million

Other Fees/Taxes/Surcharges researched (based on other states)

- Sewer Access Fee
- Wastewater Discharge Fee
- Increase Recordation tax
- Gas Tax
- Fertilizer Fee (bulk and household)
- Biosolids disposal fee
- Cell phone surcharge
- DMV registration fee surcharge

Other NGF Recommendations

- Support establishment of Virginia Natural and Historic Resources Fund to receive proceeds of Water Utility and Document Recording Fees
- Allocate funds between Water Quality Improvement Fund and Virginia Land Conservation Foundation

Actions Taken – 2004 G.A. Session

- Governor proposed legislation to create Virginia Natural and Historic Resources fund in 2004 session (HB 693 – Morgan). Left in Appropriations Committee
- Document Fee placed in Budget Bill and directed to the General Fund

Virginia's "Clean Water" Cost

- Planning level "state costs" (subset of total cost) based on existing programs and practice
- Presumes Tributary Strategies by 2010, no time limit on Southern Rivers TMDLs
- Less confidence on Southern Rivers number: will be refined as TMDL plans are developed
- Policy, budgeting, and actual construction and implementation actions will ultimately determine true "costs"

Virginia's "Clean Water" Cost

Actions	State Cost (2005-2010)
CHESAPEAKE BAY AND TRIBUTARIES	
Upgrade Treatment Plants	$500 MILLION
Cost Share Agricultural Best Management Practices (BMPs)	$580 MILLION
Implement BMPs on non-agricultural lands	$660 MILLION
VIRGINIA'S "SOUTHERN RIVERS" (OUTSIDE THE BAY WATERSHED)	
Implement BMPs for stream and river clean-up plans ("TMDLs")	$600 MILLION (not 2010)
TOTAL STATE COST	$2.34 BILLION

Total Tributary Strategy Costs and Nutrient Reductions by Source Category

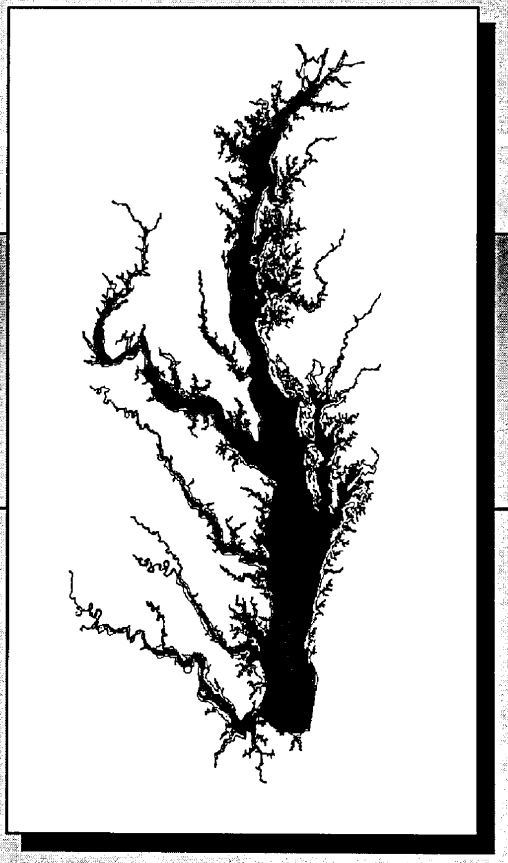
Source Category	Total Capital Cost [$ Millions]	O&M Cost [$ Millions/yr]	Total Nitrogen Reduction [Million lbs/yr]	Total Phosphorus Reduction [Million lbs/yr]
Agriculture	740	45	13.9	2.03
Urban	5,874	528	4.2	0.81
Mixed Open	323	7	1.5	0.35
Septic	74	0	0.06	0
Forest	2	0	0.003	0.0
Point Source	1,099	42	8.9	0.87
Total	9,997	622	28.6	4.07

NOTE:
1. Nonpoint source costs do not include technical assistance, outreach, and administration costs – amount to ~ 10% to 20% of capital cost
2. Point source *figures are planning level, order-of-magnitude cost opinions, accurate from -30% to +50%*

Cost-Effective Strategies

for Reducing Nutrient and Sediment Pollution in Virginia

House Joint Resolution 640
Joint Subcommittee Studying Options to Provide Funding for the Cleanup of Virginia's Polluted Waters



Ann Swanson
Chesapeake Bay Commission
July 20, 2005

APPENDIX I

Caveat

- This presentation deals ONLY with the tributaries of the Chesapeake Bay and not the Virginia Southern Rivers.
- This presentation gives you our BEST KNOWLEDGE of the costs. These numbers are constantly evolving.
- Our work looked at MAXIMUM FEASIBLE implementation of all practices – not the levels suggested in the Tributary Strategies.

A Sequential Analysis

Chesapeake 2000

Cost of a Clean Bay (2001)

How much will it cost to implement C2K?

Cost-Effective Strategies for the Bay (2004)

What are the most cost-effective strategies to control nutrients and sediment?

Legislative & Regulatory Options

Which are the best funding and policy options to pursue at the federal, state and local level?

Fundamental Questions

1. How much pollution must each state control?
2. With limited dollars, what are the best pollution control practices to pursue?
3. How will Virginia address its funding gap?

1. How much pollution must each state control?

Pollution Allocation by Jurisdiction, 2010

	Nitrogen Allocation (million pounds/year)	Phosphorus Allocation (million pounds/year)
PENNSYLVANIA	72	2.3
MARYLAND	37	2.9
VIRGINIA	51	6.0
DISTRICT OF COLUMBIA	2	0.3
NEW YORK	13	0.6
DELAWA	3	0.3
WEST	5	0.4
SUBT	183	12.8
EPA AIR REDUCTION	-8	
BASIN-WIDE TOTAL	175	12.8

Virginia (2003)
75.3 M lbs/yr N
9.7 M lbs/yr P

2. With limited dollars, what are the best pollution control practices to pursue?

Cost-Effective Strategies for the Bay:
Smart Investments for Nutrient and Sediment Reduction

Evaluated 34 practices/controls recognized by Bay Program model to determine which practices will deliver the largest load reductions for the least cost...

- Reviewed Baywide and state-by-state results
- Met with technical experts, conducted literature reviews
- Assumed implementation at "maximum feasible"
- Selected the top 6 practices
- Assessed obstacles and opportunities for large-scale adoption

What this report IS

By selecting the 6 most cost-effective practices, this report is:

- Identifying widely applicable programs that can deliver significant nutrient reduction benefits for the Chesapeake Bay.
- Showing where investments of public funds will result in the greatest water quality improvement for the dollar spent.
- Confirming that many benefits will derive by investing in agricultural management of nutrients and sediments.
- Confirming that the quickest and most reliable improvements come from upgrading sewerage treatment plants.
- Indicating that some practices are near at hand, while others will require research and development of programs that do not now exist.

What this report is NOT

By selecting the 6 most cost effective practices, this report is not:

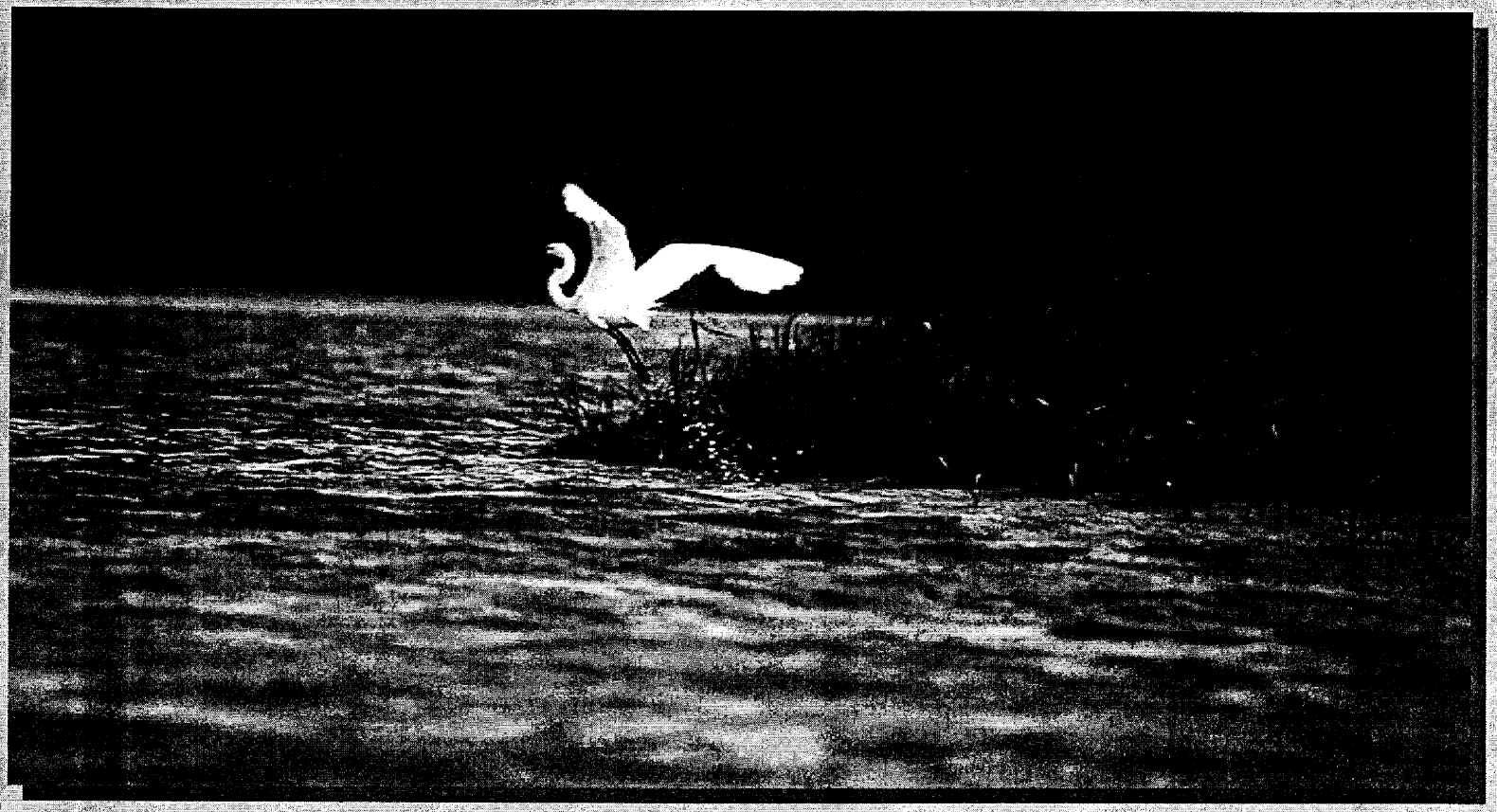
- claiming they alone can meet our C2K goals.
- assuming they apply to every tributary in the same way.
- implying cost effectiveness should be the only priority for selection of nutrient control strategies.
- implying agriculture should bear the financial burden of the Bay restoration.
- suggesting urban, forest and air controls are unnecessary or unwise.

THE TOP 6 CHOICES

- Wastewater Treatment Plant Upgrades
- Diet and Feed Adjustments
- Traditional Nutrient Management
- Enhanced Nutrient Management
- Conservation Tillage
- Cover Crops

- Practices that can be implemented short-term

Current Opportunities



Wastewater Treatment Plant Upgrades - Virginia

Through the use of bacteria, filtration devices and other state of the art changes to facility design, sewage treatment plants can further reduce nitrogen and phosphorus from their waste stream.

- Single most beneficial nutrient reduction practice, delivering greater N & P reductions than the 5 ag practices combined!
- $146M/yr cost (2003-2010) includes annualized capital and annual O&M; Can be spread over large user base
- Assumes 4 mg/l where feasible; some flexibility for nutrient trading (based upon design flows)
- Reliable, long term nutrient reductions

Traditional Nutrient Management - Virginia

Nutrient management plans prescribe the use and timing of nutrients in manure and commercial fertilizer to reduce excess application while assuring no loss of yield.

- Applying Nutrient Management Plans to all available acreage would reduce N by 2.8 M lbs
- At $7 per acre, high cost effectiveness for N: $2.07 per lb reduced
- Effectiveness dependent upon full implementation and available technical assistance
- Accelerates need for alternative uses of excess manure

Conservation Tillage - Virginia

To reduce erosion and nutrient runoff, crops are planted with minimal cultivation of the soil while retaining cover crops and crop residue that covers a minimum of 30 percent of the field.

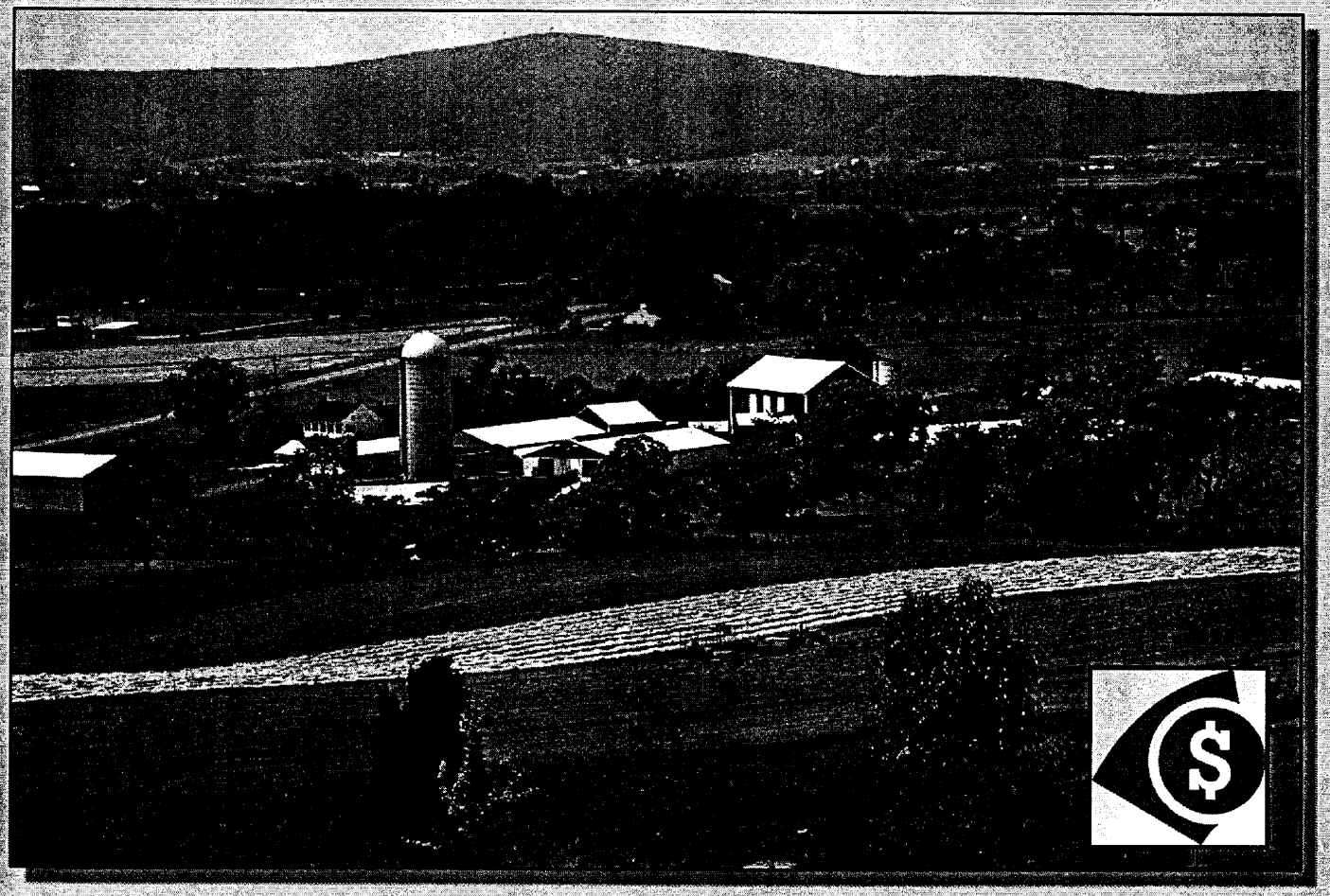
- Among agricultural practices, single most beneficial practice for P and sediment, delivering 40% of Virginia's sediment goal
- Proven, widely adopted practice, available technology
- Limits incorporation of manure; may aggravate ammonia emissions
- Increased need for manure transport and alternative use

Cover Crops - Virginia

Small grain crops planted in the fall to consume excess nutrients remaining in the field after harvest. Cover crops are not fertilized and are killed or plowed under in the spring.

- Potential to deliver 2.5m lb N reduction along with some P reductions (0.05m lbs)
- Even at $27 per acre, cost effective: $3.90 per lb. N reduced
- Needs consistent annual funding source; level of incentive payment required for large scale adoption uncertain
- Timing of planting crucial to achieving full nutrient reduction potential

Emerging Opportunities



Diet and Feed Adjustments

Feed formulas can be adjusted to increase digestion and absorption of nutrients by the animals, resulting in less nutrients excreted in manure.

- **Research indicates potential N reductions of 30-50% and P reductions of 40-60% for poultry, dairy, cattle, swine manures Baywide; State-by-state benefits have not been calculated.**
- **On a typical dairy farm, 70-80% of the nitrogen contained in feed is excreted in manure. Lack of consolidation and integration in the dairy industry pose challenges to implementing/quantifying diet and feed changes on a large scale.**
- **Continued research and outreach is essential to enable large scale implementation beyond poultry**

Enhanced Nutrient Management - Virginia

- Enhanced nutrient management provides a 15% further reduction in nutrients applied to cropland beyond traditional nutrient management.

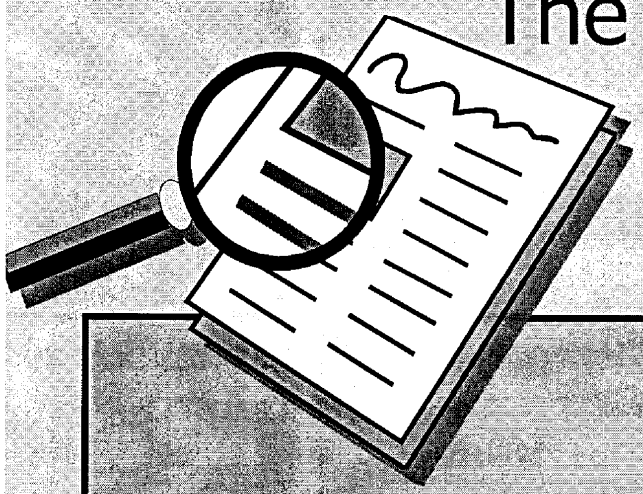
- ENM on all row crops and hay acreage would significantly reduce N runoff beyond that achieved from traditional NMPs.
- Assumes $40 per acre to provide "safety net" for risk of reduced yield
- Pilot studies may be needed before large-scale adoption
- This practice will exacerbate excess manure issues

Annual Cost & Benefit of the 6 Cost-Effective Practices, in Virginia (2003-2010)

Source	% of total Tributary Goal			Total Cost $M/yr	% of Total Tributary Strategy Cost
	N	P	Sed		
Waste Treatment Upgrades	50	42	N/A	145.7	8
Agricultural Practices	38	18	47	78.5	9
Total	88	60	47	224.2	17

Annual Cost for the 6 Cost-Effective Measures in Virginia (2003-2010)

	Total Cost (million $)	Nitrogen Cost per Pound Reduced ($/lb)	Phosphorus Cost per Pound Reduced ($/lb)	Sediment Cost per Ton Reduced ($/ton)
Waste Treatment Upgrades	$145.7	$8.40	$32.98	N/A
Enhanced Nutrient Management	$60.4	$17.99	$338.84	N/A
Nutrient Management	$5.7	$2.07	N/A	N/A
Cover Crops	$9.8	$3.91	$225.79	$403.23
Conservation Tillage	$2.6	$7.41	$7.55	$15.23
Diet and Feed Changes	$0.0	N/A	$0.0	N/A
All 6 BMPs	$224.2			



The CBC Cost Effectiveness Report vs. the VA Tributary Strategy

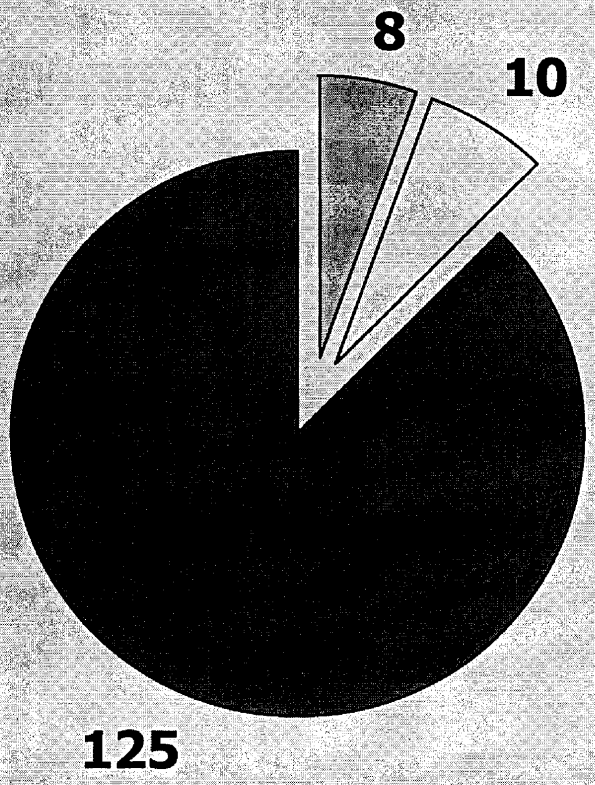
A comparison of assumptions

	Chesapeake Bay Commission 2003-2010, Assumed New Implementation	VA Tributary Strategy By 2010, Existing and Planned Implementation
Waste Treatment Upgrades	Effluent Concentrations= 4mg TN/L & 0.3 mg TP/L	Effluent Concentrations= 3-8mg TN/L & 0.3-1.0 mg TP/L
Enhanced Nutrient Management	1,509,241 Acres	10,410 Acres
Ag Nutrient Management	819,887 Acres	1,009,595 Acres
Cover Crops	363,929 Acres	413,282 Acres
Conservation Tillage & Continuous No-Till	289,630 Acres	501,304 Acres
Diet and Feed Changes	16% reduction in manure TP applications to cropland	0% reduction in manure TP application to cropland

Some closing thoughts...

- The Federal government cannot be relied upon to pay our bill
- Point source pollution control presents Virginia's greatest opportunity
- The costs will be ongoing, with needs extending far beyond 2010
- Spreading the burden out offers the greatest gain
- The longer that we wait, the more expensive... or impossible it will get.

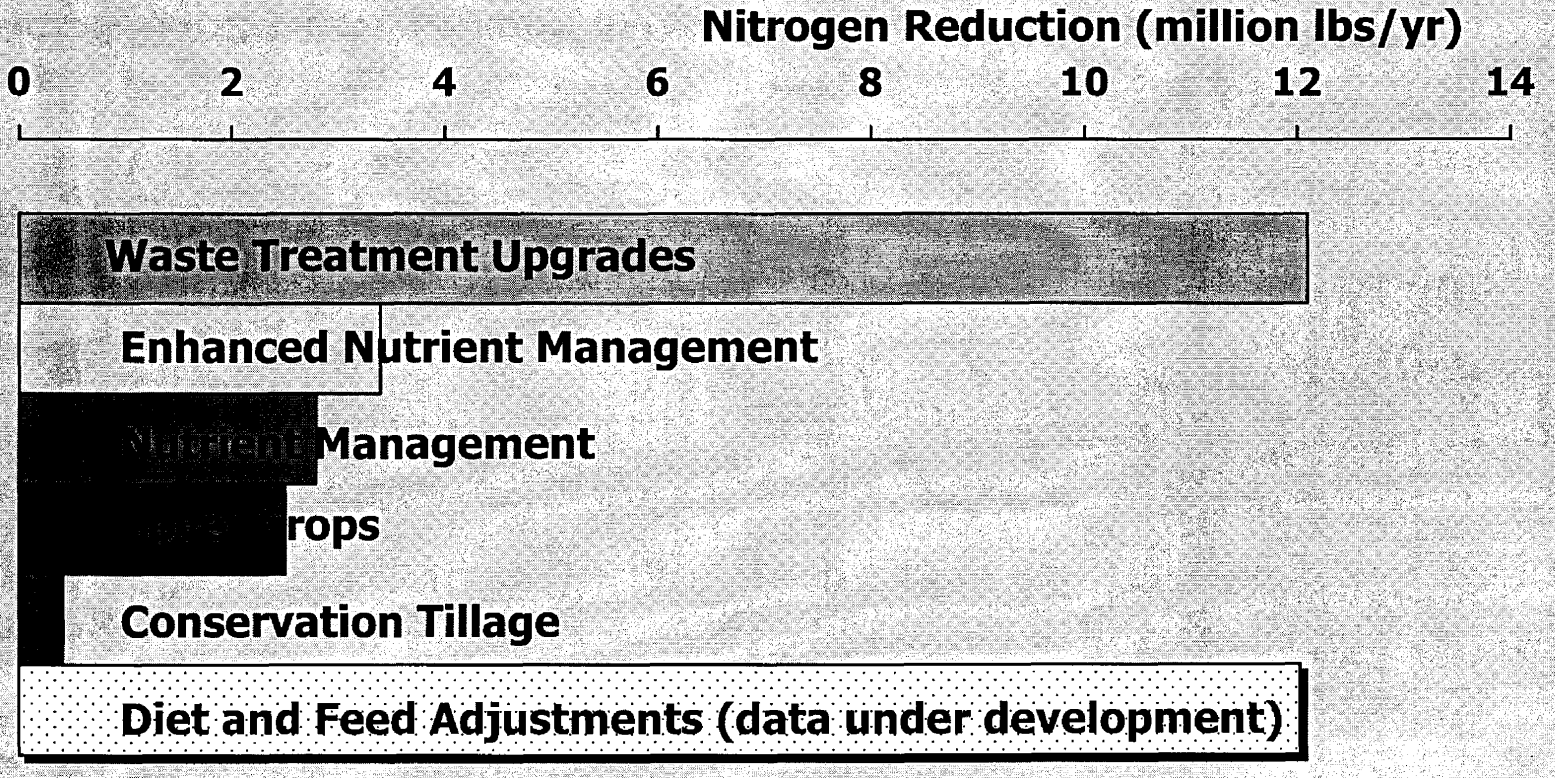
The Federal government cannot be relied upon to pay our bill...



Annual Agriculture Conservation Spending
2005-2010
Millions $

- **Projected State Funds**
- **Projected Federal Funds**
- **Projected Deficit**

Point source upgrades present Virginia's greatest opportunity...

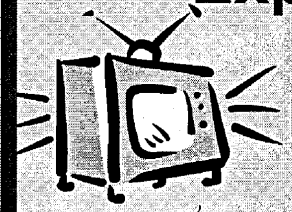


Maximum Feasible Nitrogen Reduction Virginia
For individual best management practices (2002 baseline)

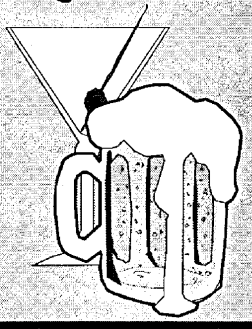
Spreading the burden out offers the greatest gain…

The **average annual cost** for each of the projected 2.8 M households in Virginia by 2010 is **$125** assuming that the state share is $1.75 billion*. This would be further reduced by the financial support already provided by other state cost-share programs.

Other Average Household Expenditures



Entertainment $1,863



Alcoholic Beverages $372

Source: National Census, 2002

* Virginia state-share Tributary Strategy estimate

The costs will be ongoing, with needs extending far beyond 2010...

FOR EXAMPLE:

- Sewage Treatment Plants have a 20-year design life
- Cover crops must be purchased every year
- Most agricultural practices have a 15 year life or less
- Stormwater management will be hugely expensive
- Maintaining the cap in the face of growth will require more practices to be installed

SIMPLY PUT…

establishing a significant, long-term DEDICATED FUNDING SOURCE is the only way to remove Virginia's waters from the Federal Dirty Waters List and restore the Bay.

Chesapeake Bay Commission

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MARYLAND

Department of the Environment

Maryland Bay Restoration Fund

Robert M. Summers, Director

Water Management Administration

Maryland Department of Environment

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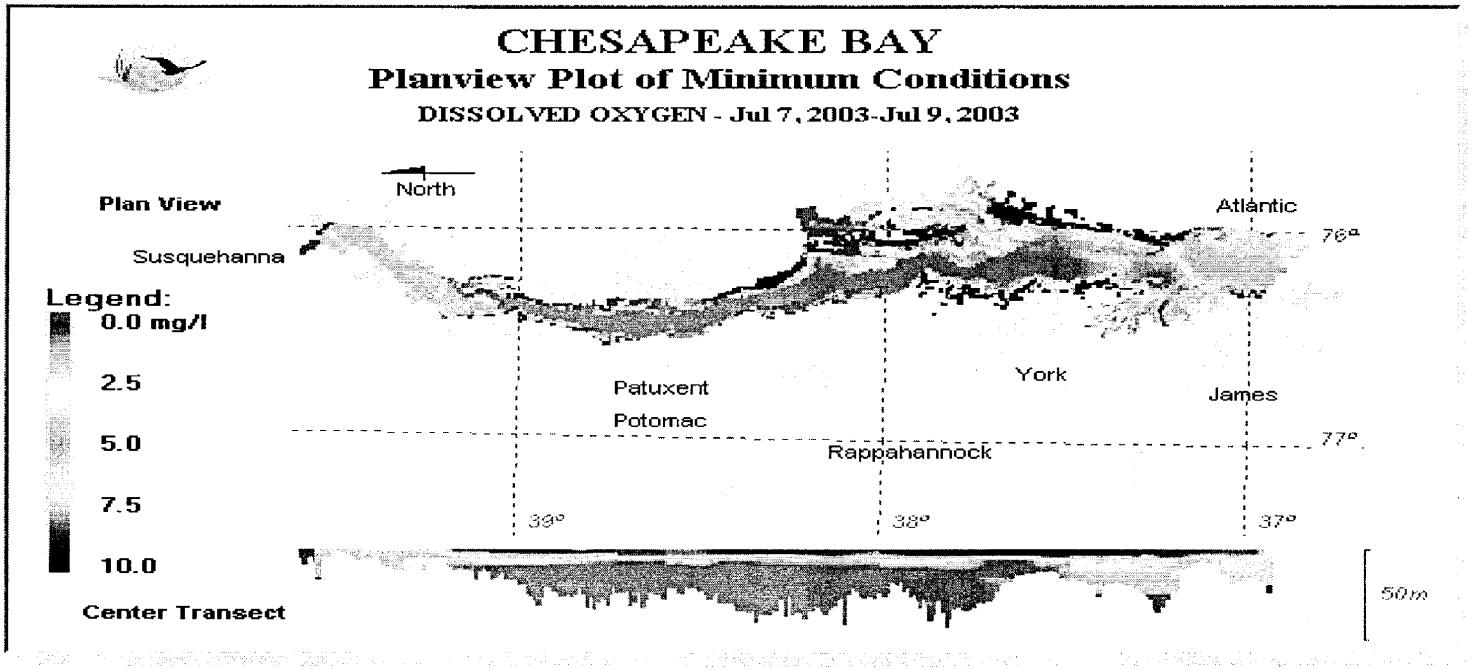
Bay and River Water Quality Commitment

By 2010, correct the nutrient- and sediment-related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act.



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Cap Load Allocations by State

CHESAPEAKE BAY RESTORATION PARTNERSHIP

	Nitrogen Allocation (million pounds/year)	Phosphorus Allocation (million pounds/year)
PENNSYLVANIA	72	2.3
MARYLAND	37	2.9
VIRGINIA	51	6.0
DISTRICT OF COLUMBIA	2	0.3
NEW YORK	13	0.6
DELAWARE	3	0.3
WEST VIRGINIA	5	0.4
SUBTOTAL	183	12.8
CLEAR SKIES REDUCTION	-8	
BASIN-WIDE TOTAL	175	12.8

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Maryland Annual Nutrient Loading Cap

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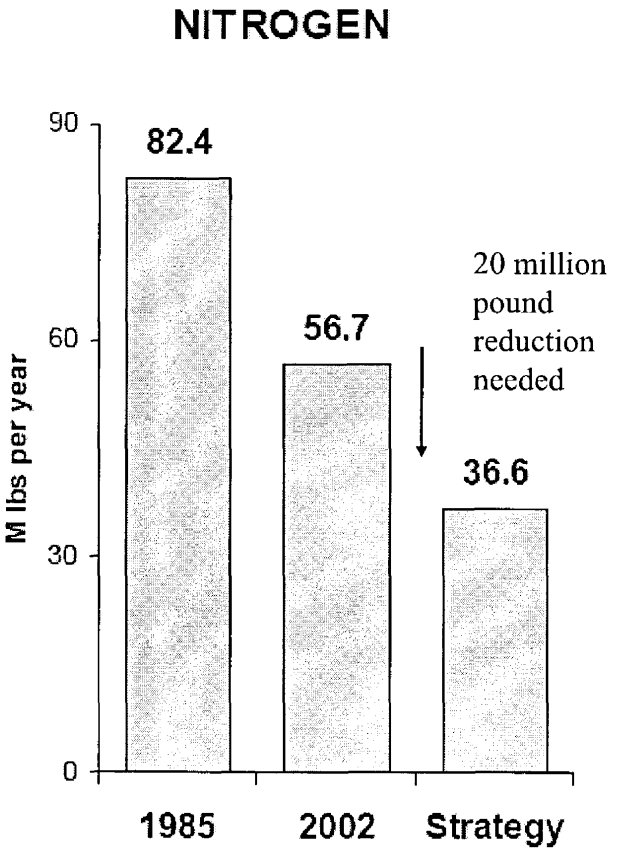
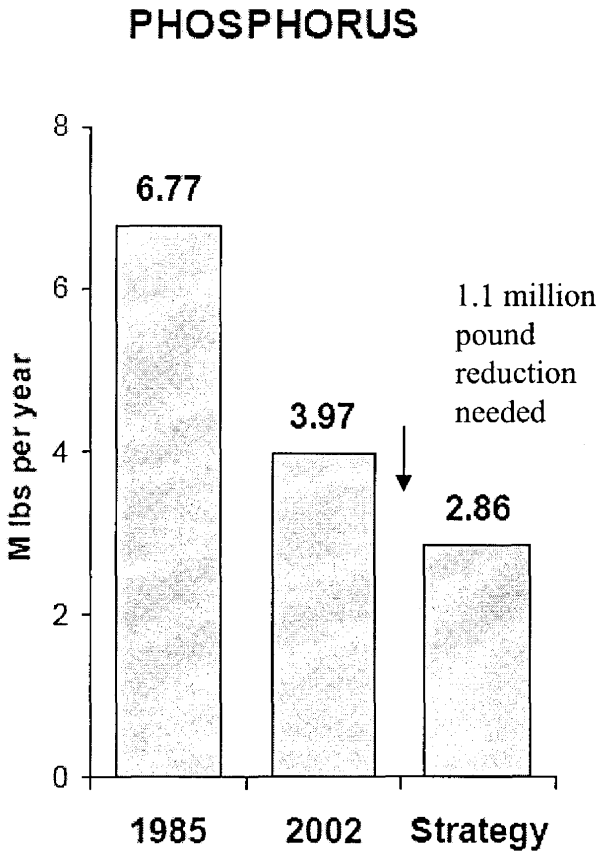
CHESAPEAKE BAY RESTORATION PARTNERSHIP

Nitrogen – 37.25 Million pounds

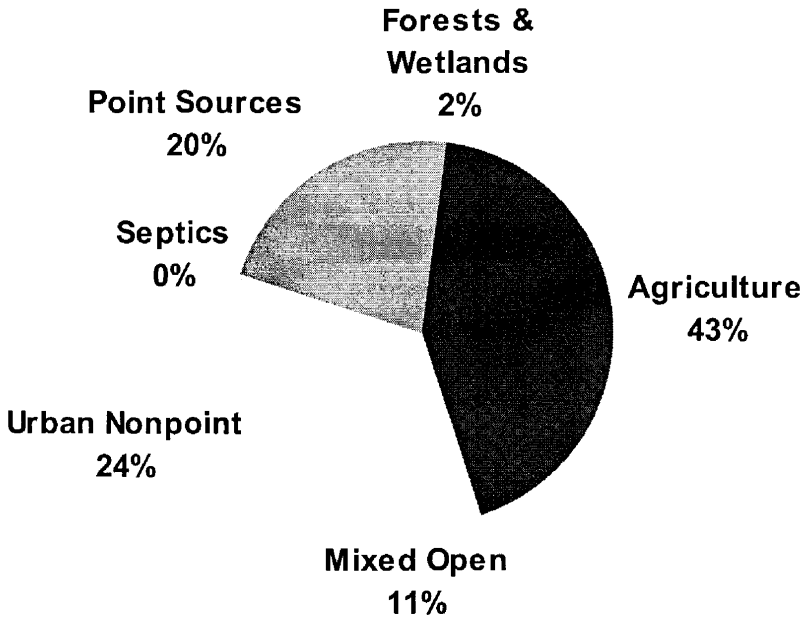


Phosphorus – 2.92 Million pounds

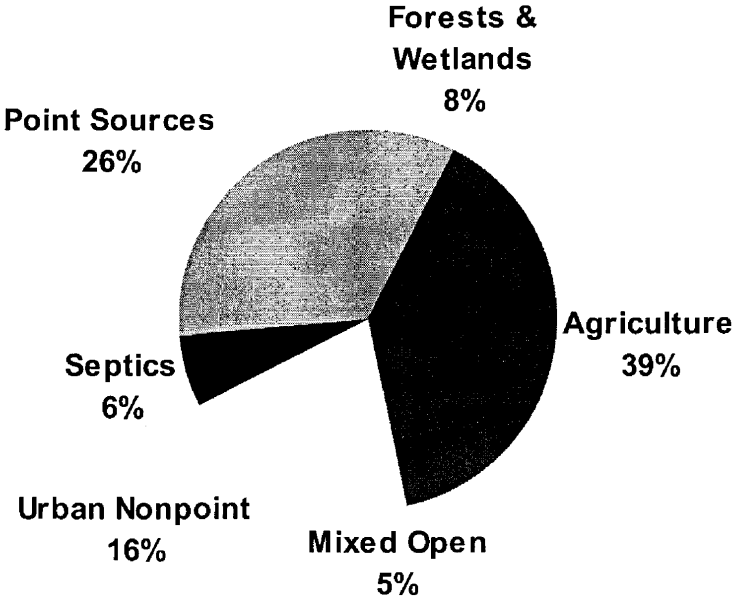


MARYLAND

MD Nutrient Sources (2002)

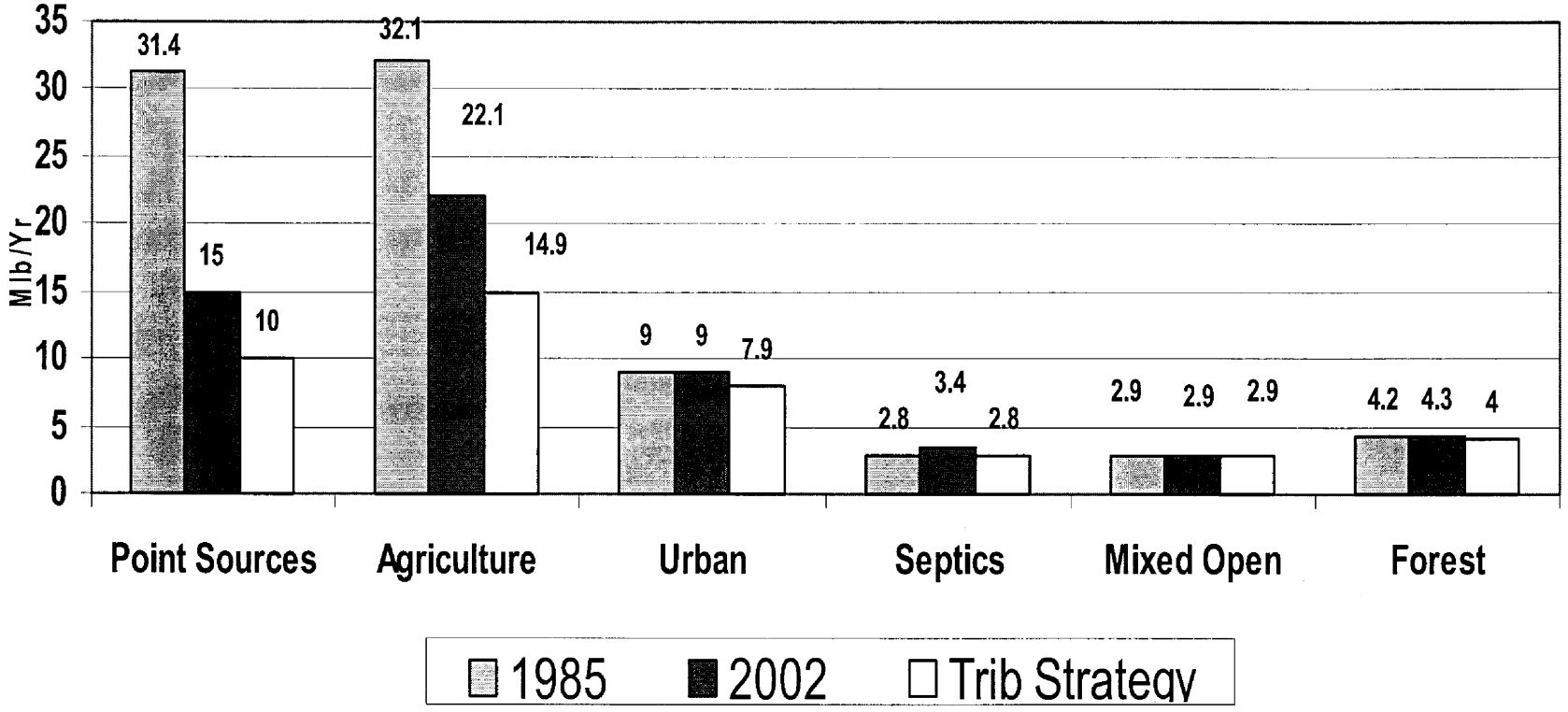


Phosphorus



Nitrogen

Nitrogen Loading from MD Sources



Cost-effectiveness

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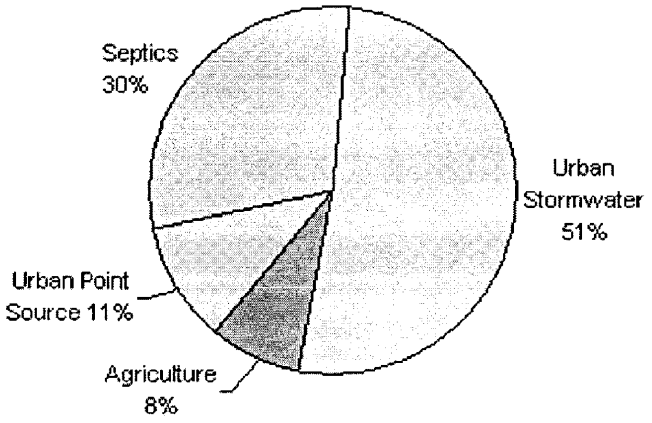
CHESAPEAKE BAY RESTORATION PARTNERSHIP

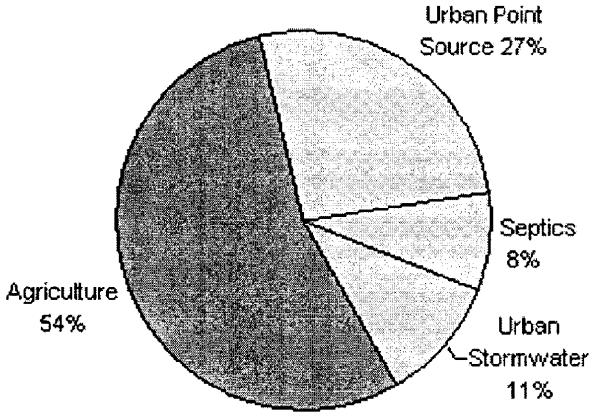
Cost



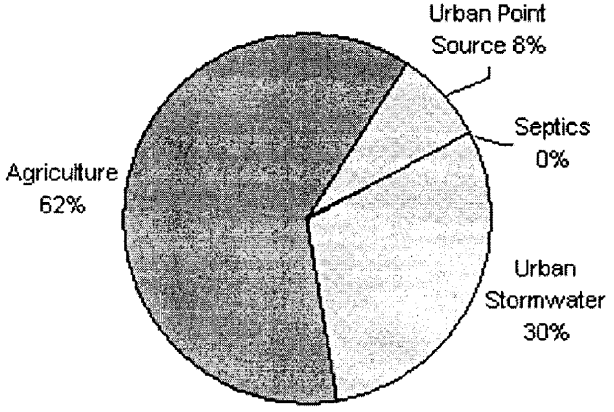
Total estimated cost 2004-2010 and beyond:

$10 Billion

Nitrogen Reductions



Phosphorus Reductions



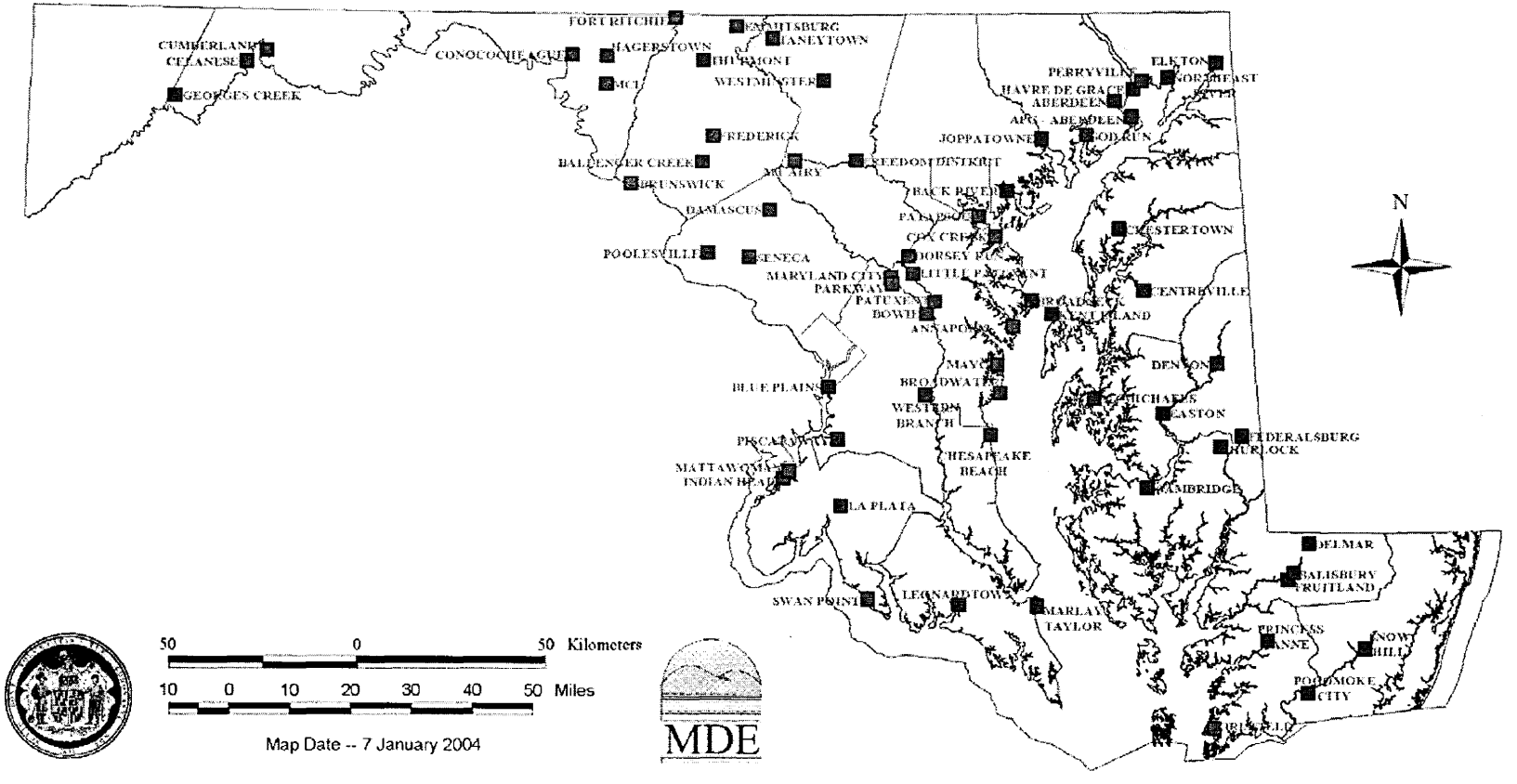
MARYLAND

Source: http://www.dnr.state.md.us/bay/tribstrat/exec_summary_5_6_2.pdf

Biological Nutrient Removal (BNR)

- In support of Maryland's commitment under the 1983 Chesapeake Bay Agreement, the State implemented the Biological Nutrient Removal (BNR) Program.
- The BNR program called for sewage treatment plans with design capacity of 500,000 gallons per day or more to upgrade to achieve 8 mg/l total nitrogen in effluent discharge water quality.

Maryland's Major Wastewater Treatment Plants in the Chesapeake Bay Watershed



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BNR Accomplishments

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- The majority of the 66 targeted wastewater treatment plants have been upgraded with the BNR technology.
- Nitrogen load from point sources has been reduced from 1985 level by 16.9 million pounds per year (52%)
- Phosphorus load from point sources has been reduced from 1985 level by 1.7 mlb/yr (63%)

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BNR Funding

CHESAPEAKE BAY RESTORATION PARTNERSHIP

Of the 66 major WWTPs in Maryland:

- 40 in operation with BNR
- 9 under construction for BNR
- 2 under construction for BNR/ENR
- 15 in BNR/ENR design or planning

State general obligation bond funding:

- $ 600 million total estimated State and local cost
- $ 300 million total estimated State share
- $ 208 million State funding authorized to date

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Bay Restoration Fund

CHESAPEAKE BAY RESTORATION PARTNERSHIP

The Bay Restoration Fund (Senate Bill 320) will allow Maryland to achieve over 1/3 of the necessary additional nutrient reductions by:

- upgrading wastewater treatment plants with Enhanced Nutrient Removal facilities,
- upgrading septic systems in the Critical Area, and
- implementing cover crop on agricultural land.

MARYLAND

Enhanced Nutrient Removal

ENR is defined in the law as:

- An enhanced nutrient removal technology that is capable of:
  - *3 mg/l total nitrogen*
  - *0.3 mg/l total phosphorus*
  - *calculated on an annually averaged basis*
- Or, the lowest level the Department determines is practicable for a facility

Sewage Treatment Plant Upgrade Priorities

- 66 major plants discharging to Chesapeake Bay will be upgraded first to reduce the nitrogen loading to the Bay by 7.5 million pounds per year
  - *These plants represent over 95% of Maryland's wastewater flow into the Bay*
  - *It is most cost-effective to upgrade the larger plants*
  - *Upgrading these plants alone will meet MD's wastewater nutrient reduction goals for the Bay*
- Other facilities may be upgraded later, based on consideration of:
  - *Cost effectiveness, water quality benefit, readiness to proceed, and nitrogen and phosphorus loading*

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Bay Restoration Fund

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Two dedicated funds created:
- One, financed by sewage treatment plant users, will raise $60 million per year to upgrade Maryland's wastewater treatment plants to achieve enhanced nutrient removal (ENR)
- A second, financed by users of onsite sewage disposal systems, will raise $12.6 million per year to upgrade septic systems and implement cover crop activities to reduce nitrogen loading to the Bay

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Revenue and Financing

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Estimated to generate $60 million annually from sewage treatment plant users
  - *Will be used to back over $750 million in revenue bonds to fund the upgrade of 66 major sewage treatment plants. Maryland will continue to seek federal funding to cover funding gaps.*
- Estimated to generate $12.6 million from septic system users
  - *60% to be used for septic system upgrades, 40% for cover crop activities*

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Funding

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Supported by a $2.50 per month per household surcharge on sewer bills
- For commercial and industrial users, $2.50 per month per "equivalent dwelling unit" (EDU) based on wastewater flow
- $30 annual fee for users of septic systems, holding tanks or other onsite sewage disposal systems (OSDS)

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Timing

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- The surcharge on sewer bills and for septic system users that receive a water bill began on January 1, 2005.
  - *Collected by the water or sewer authority*
- The surcharge for septic systems begins on October 1, 2005.
  - *Collected by county governments*

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Fund Management

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Maryland Water Quality Financing Administration (WQFA) is managing the financial and accounting aspects of the fund.
- In cooperation with the Comptroller's Office, WQFA has worked with water and sewer billing authorities to establish the billing process.
- Program status – billing has been initiated.

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Wastewater Treatment Plant Upgrades

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Water Management Administration is managing the technical and administrative aspects of the fund.
- Priority List for WWTP ENR upgrades.
- CSO/SSO and Sewer Rehabilitation Projects.
- Financial Assistance for ENR Operation and Maintenance costs.
- Using existing procedures established for the BNR Program.
- Program Status – ENR upgrades are underway

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Administrative Costs

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- To carry out billing and fund management
  - *Comptroller's Office – up to 0.5%*
  - *Local governments/billing authorities – up to 5%*
- To implement the upgrade programs at the Department of the Environment
  - *up to 1.5% of wastewater treatment plant funds*
  - *up to 8% of septic system funds*

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Eligible Uses of the WWTP Fund

- Up to 100% of the costs of planning, design, and construction of ENR upgrades for flows up to the design capacity
- Up to $5 million per year for Combined Sewer Overflow abatement and existing sewer rehabilitation (Fiscal Year 2005-2009)
- After Fiscal Year 2009, up to 10% for ENR operation and maintenance costs

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"Full Speed Ahead"

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- One facility has already been upgraded with ENR using state and federal grants (Princess Anne's).
- Four (4) facilities are under construction to be upgraded to BNR/ENR (Celanese, Easton, Kent Island and Hurlock).
- Eleven (11) facilities are under design to be upgraded to BNR/ENR.
- Twenty-eight (28) facilities have initiated the planning for ENR.

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Septic System Upgrades

- There are over 420,000 septic systems in Maryland
- State and local agencies to develop and implement an upgrade program
  - *Identify the owners' names and addresses*
  - *Establish education and outreach to explain the program and availability of funding*
  - *Implement system upgrade program*
  - *Develop regulations to govern program*

Eligible Uses of the Septic System Fund

- With priority given to failing systems in the Critical Area, up to 100% of the cost of:
  - *upgrades of existing systems to best available technology for nitrogen removal*
  - *the cost difference between a conventional system and a system that uses best available technology for nitrogen removal*
- Implementation of the cover crop activities by the Maryland Department of Agriculture

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Identify Users of OSDS

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- No master inventory exists
- Data availability vary with county
- All counties have sewer service area maps
- All counties are covered by the MD Real Property Data Base

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Method of collecting the OSDS fee

- Identify all improved properties using the Real Property Data Base (Maryland Department of Assessments and Taxation) and County records.
- Identify all properties in areas served by public water or sewer using County Master Water and Sewer Plans.
- Delete those properties in areas served by public water or sewer from all improved properties.
- Bill improved properties not in areas served by public water and sewer.
- Provide process to appeal, as not all improved properties will actually have onsite sewage systems.

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OSDS Fund

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Approximately $6,500,000 per year available
- Approximately 700 system upgrades per year
- Best Available Technology (BAT) for nitrogen removal requirements are under development by a technical workgroup including State and local government and industry representatives

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Cover Crops

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Approximately $4,700,000 per year available
- Maryland Department of Agriculture (MDA) is managing the technical and administrative aspects of the cover crop implementation.
- MDA is using existing procedures established for the Maryland Cover Crop Program.
- Program status – ongoing

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OSDS & Cover Crop Fund Benefits

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Onsite system upgrades will reduce the nitrogen loading to the Bay by an additional 105,000 pounds per year by 2010.
- Cover crops will reduce the nitrogen loading to the Bay by additional 1.4 million pounds per year and phosphorus by additional 73,800 pounds per year.

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Advisory Committee

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- Evaluate the cost, funding and effectiveness of the wastewater treatment plant upgrades
- Recommend future changes to the restoration fee, if necessary
- Consult with and advise the counties and the Department regarding the septic system upgrade program

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Advisory Committee Due Dates

CHESAPEAKE BAY RESTORATION PARTNERSHIP

- January 15, 2005 – Report on methods of collecting fees from users of on-site sewage disposal system (OSDS).
- January 1, 2006 (and every year thereafter) – Report on findings and recommendation.
- December 31, 2006 – Report on administrative costs to local governments for collecting fees and the reasonableness of allowable reimbursement.
- December 31, 2006 – Report on implementation and costs of MDE's OSDS outreach and upgrade program.

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Department of the Environment

Maryland Department of Environment

For additional information

call 410-537-3567

or email webmaster@mde.state.md.us

MDE

Presentation to the HJR-640 Committee

By

Joseph H. Maroon

July 20, 2005

DCR

Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

State Parks • Soil and Water Conservation • Natural Heritage
Outdoor Recreation Planning • Land Conservation
Dam Safety and Floodplain Management
Chesapeake Bay Local Assistance

www.dcr.virginia.gov

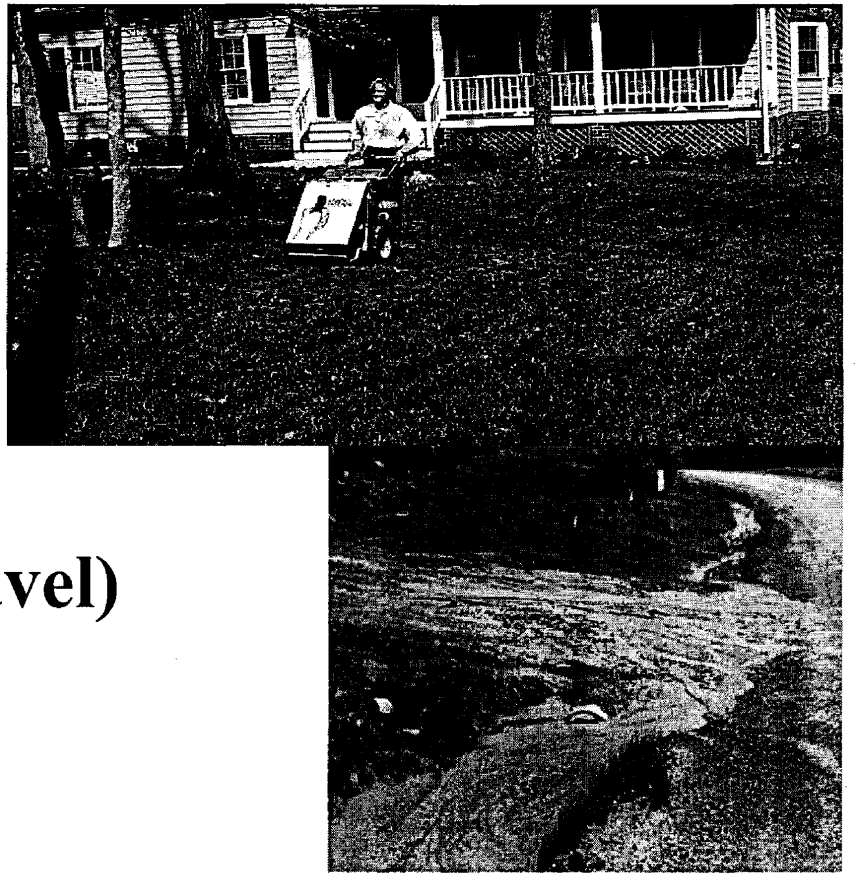
APPENDIX K

What Is Nonpoint Source Pollution?

- NPS pollution comes from thousands of diverse sources (agricultural fields, lawns, streets, construction sites, etc.)
- Most difficult source to control
- Multiple strategies to control
- Mix of voluntary and regulatory programs
  DCR is the state's lead nonpoint source pollution control agency

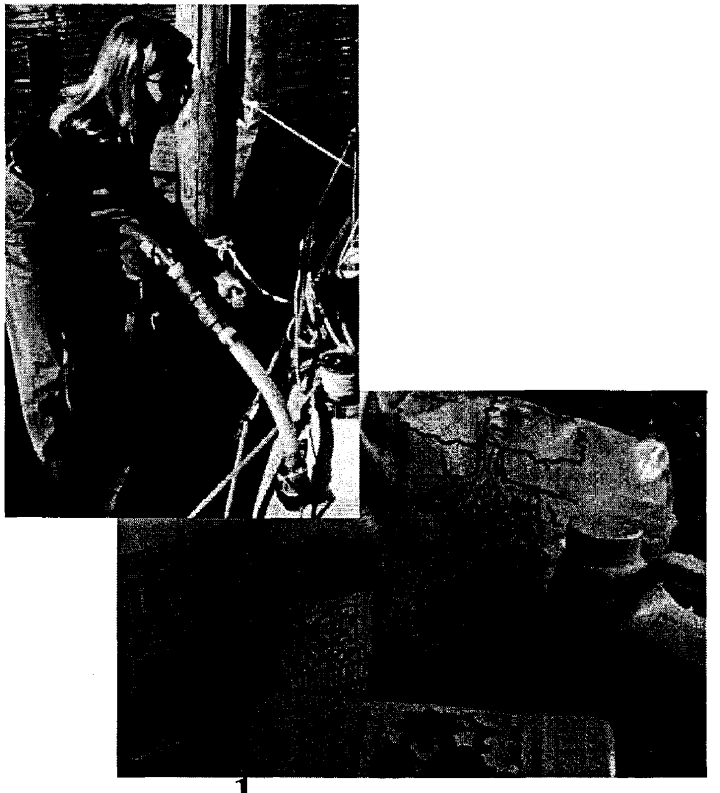
Nonpoint Source Pollutants

- **Nutrients**
  - Fertilizers
  - Septic systems
  - Pet and animal waste
  - Yard wastes and debris
- **Sediment (silt, sand, gravel)**
  - Construction sites
  - Roadways
  - Suburban lawns and gardens
  - Stream banks



Nonpoint Source Pollutants

- **Bacteria**
  - Septic tanks
  - Sewer lines
  - Boating waste disposal
  - Pet and animal waste



- **Toxic contaminants**
  - Oil, grease and gasoline from roadways
  - Home, garden and lawn chemicals

Why Focus on Agricultural Nutrient Reductions?

- House Bill 2777 and Senate Bills 810 & 1235 require non-point measures to focus on agricultural sources.
- Contributes largest amount of Phosphorus (41%) & second most amount of Nitrogen (29%) to Bay and Virginia Tributaries.
- Major contributor to Virginia's "impaired" waters.
- Among most cost-effective measures ("bang for buck")
- State programs can benefit the farm and improve land and water quality.

Recent Ag Quotes

Cattle fenced out of South River:
"Honestly, It's a win-win for me. I get better use of my pasture now. No question I've got healthier cattle now. If (conservation programs) didn't benefit me, I'm sure I'd be thinking about the Bay a lot less." [Staunton News Leader, 2005]

Installed pit for managing manure:
"Every day we were having to scrape our barn lots and spread the manure on our fields, even if they were covered in snow. Storing our manure has cut our commercial fertilizer costs by 30 to 50 percent. Now we can spread the manure when we are ready, and we aren't losing as many nutrients by leaving it on the ground before we actually use it. " [The Winchester Star, January 31, 2005]

Virginia Farm Bureau Federation, July 14, 2005
"Virginia's agriculture and forestry industry is dependent upon natural resources. Consistent funding of both agricultural cost-share programs and the Reforestation of Timberland program is imperative as Virginia continues to address water quality initiatives."

Why Today's Discussion is not about addressing Urban NPS Sources?

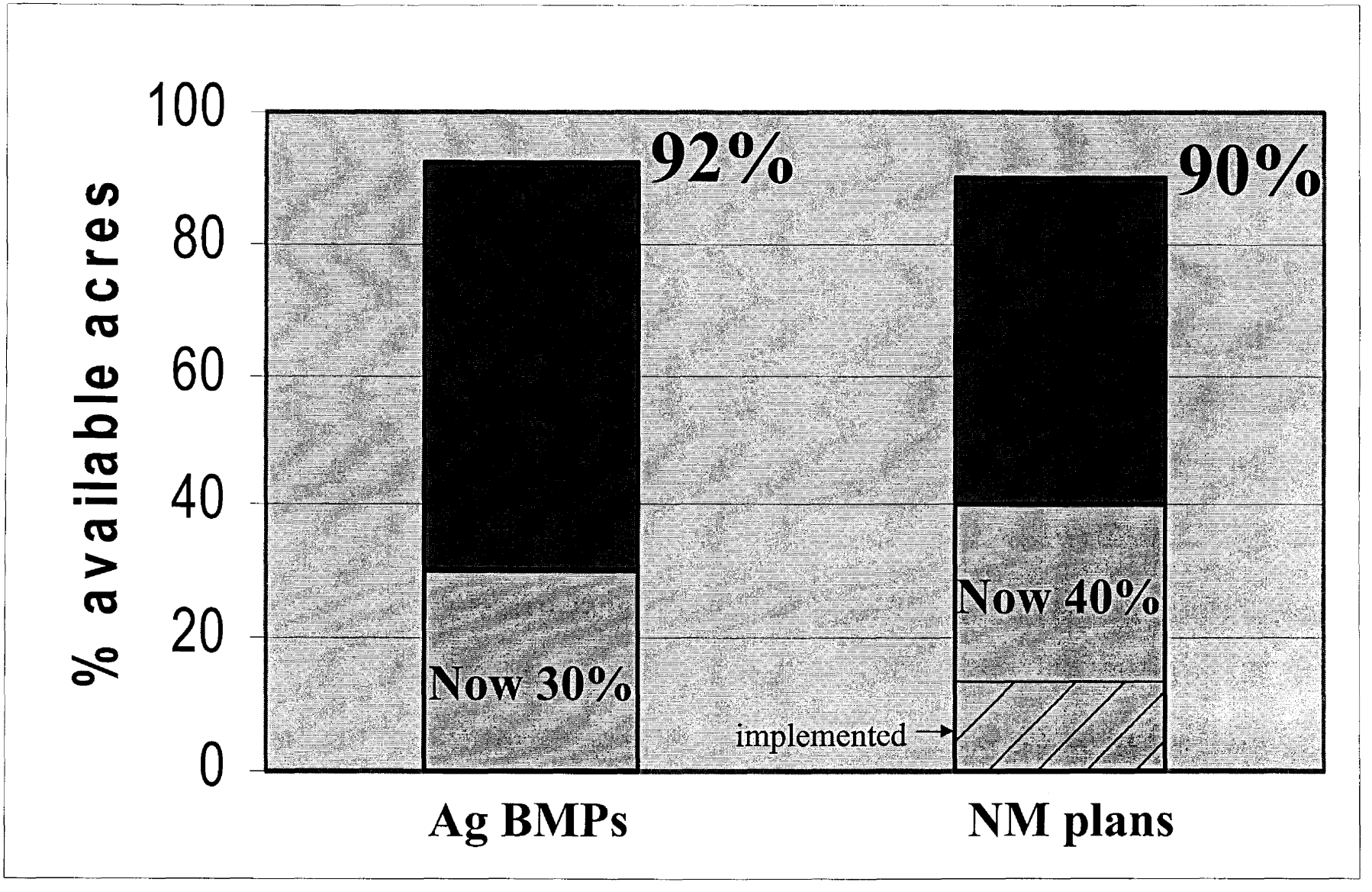
- Urban/Suburban/Rural Developed Lands are significant sources: Phosphorus 32%; Nitrogen 23%
- Not main focus of Ches. Bay Commission report
- Many improvements (retrofits) involve substantial costs; others can be more cost-effective.
- While state share is significant, majority of costs will be borne by local governments and development
- Progress being made through existing regulatory programs (Stormwater Management Program, Erosion & Sediment Control, Bay Preservation Act) and limited grant funding.

Agricultural Reductions
What Must Be Done?

- Long-term substantial and sustained funding for Non-Point Practices and Programs and for increased state/local staffing & private involvement to deliver the programs.
- Focus must be on getting better results: As of July 1, greater focus on cost-effective BMPs & targeting of BMPs to correct impaired streams (TMDLs).
- Change state's traditional ag. cost-share program from "education/demonstration" to "implementation".
- New/expanded strategic WQ initiatives (diet & feed mgt., litter transport, animal waste alternative uses).
- Unprecedented levels of participation requires active outreach to farm community. (47,600 VA farms)

Agricultural Reductions

What Must Be Done?



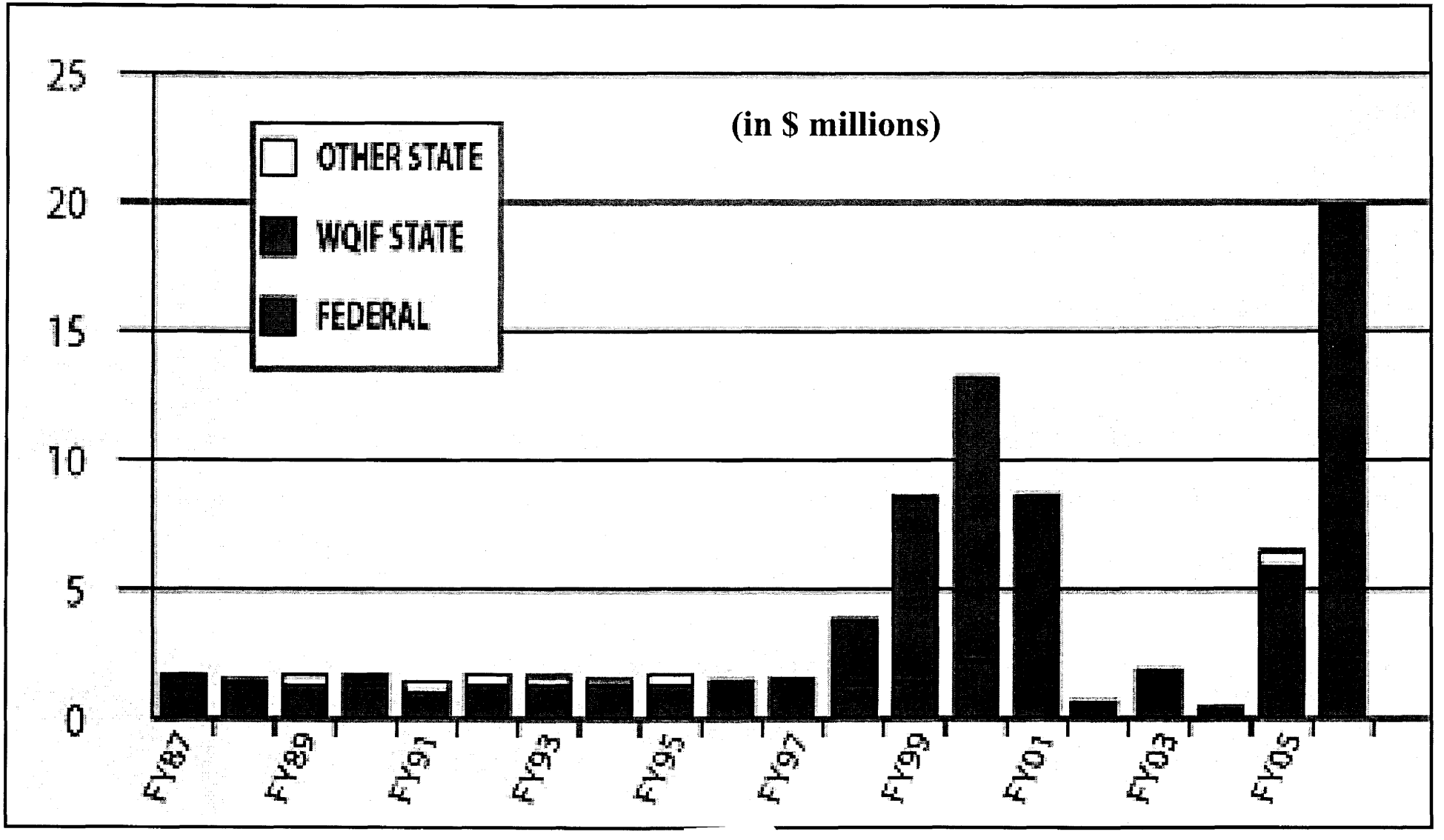
Virginia's "Clean Water" Cost

Actions	State Cost (2005-2010)
CHESAPEAKE BAY AND TRIBUTARIES	
Upgrade Treatment Plants	$500 MILLION
Cost Share Agricultural Best Management Practices (BMPs)	***$580 MILLION***
Implement BMPs on non-agricultural lands	$660 MILLION
VIRGINIA'S "SOUTHERN RIVERS" (OUTSIDE THE BAY WATERSHED)	
Implement BMPs for stream and river clean-up plans ("TMDLs")	***$600 MILLION (not 2010)***
TOTAL STATE COST	**$2.34 BILLION**

Virginia Agricultural BMPs

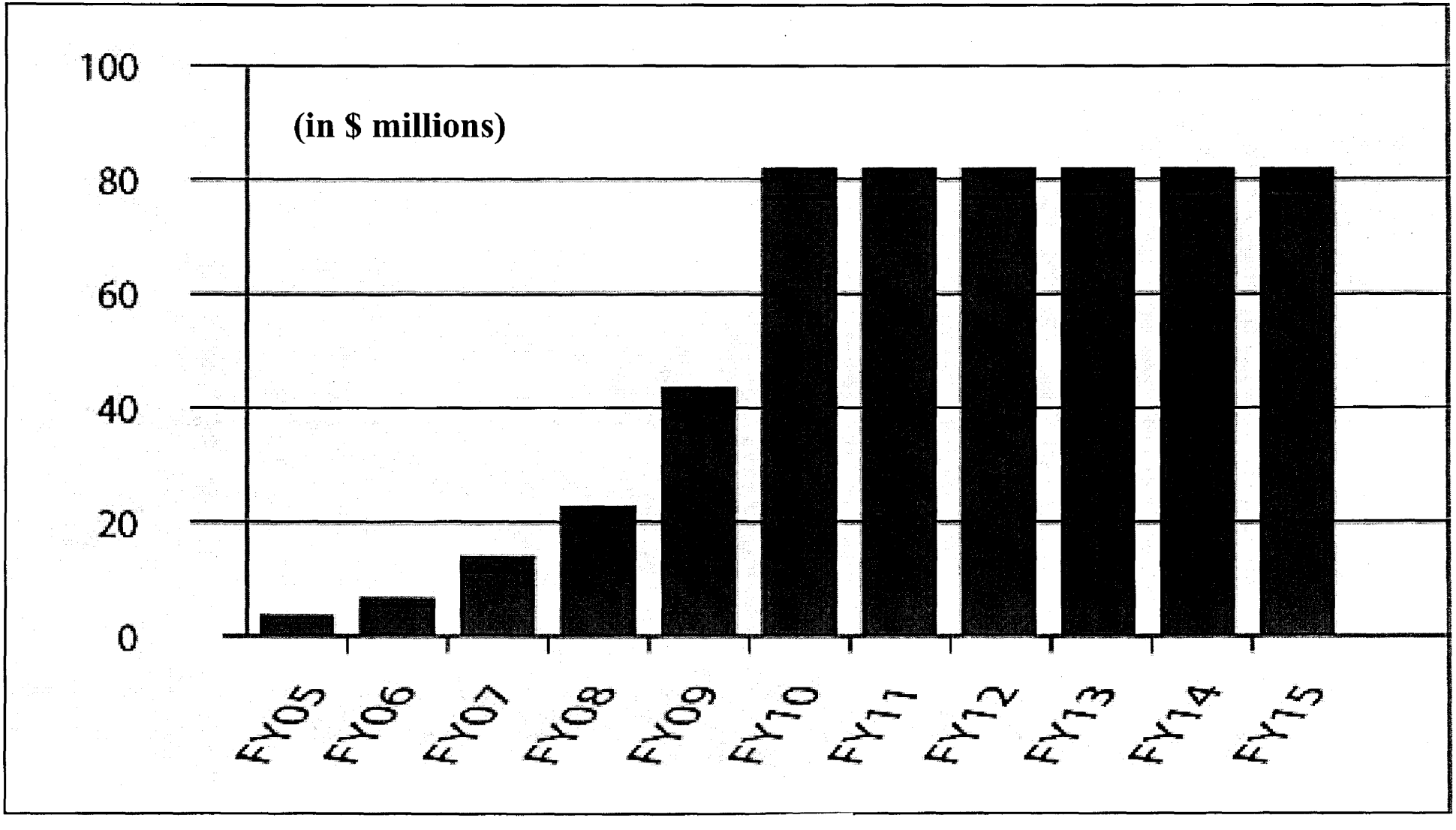
- Cover Crops
- Continuous No-till System
- Nutrient Management Planning
- Filter Strip
- Riparian Forest Buffer
- Stripcropping Systems
- Livestock Exclusion
- Alternative Water System
- Stream Protection
- Stream Crossing & Hardened Access
- Animal Waste Control Facility
- Sinkhole Protection
- Loafing Lot Management System
- Permanent Vegetative Cover of Critical Areas

Historic funding for Ag Cost-Share has limited our progress



What will it cost?

Tributary Strategies Ag BMP Costs -$ 580 M



What will it cost?

Southern Rivers TMDL BMP Costs - $ 600 M

- At least 40% WQIF nonpoint funds directed to Southern Rivers (10.1-2129.A.1)
- 306 TMDLs on list of nonpoint pollution impaired stream segments
- Funding will be needed as detailed TMDL Implementation Plans are completed
- Declining federal funds have provided the primary source of funding for TMDL implementation

Relating Bay Commission & VA Priority Practices

NPS Practices	CBC Choices For VA	VA Trib. Strategies		
		Target (acres)	Cost (millions)	% goal Nit./Phos.
1. Animal Diet & Feed Management	Poultry	poultry/swine dairy	TBD	TBD
2. Traditional Nutrient Management	820,000 ac	1,009,595 ac	$ 14	20/13
3. Enhanced Nutrient Mgmt (Yield Reserve)	1.5 million ac	10,410 ac	$ 0.1	<1/<1
4. Conservation Tillage	290,000 ac	501,304 ac	$ 11	6/19
5. Cover Crops	364,000 ac	413,282 ac	$ 43	10/<1
6. Riparian Buffers		312,534 ac	$ 124	15/12
7. Livestock Exclusion		916,190	$ 190	9/14

Virginia Priorities
New and Expanded Initiatives

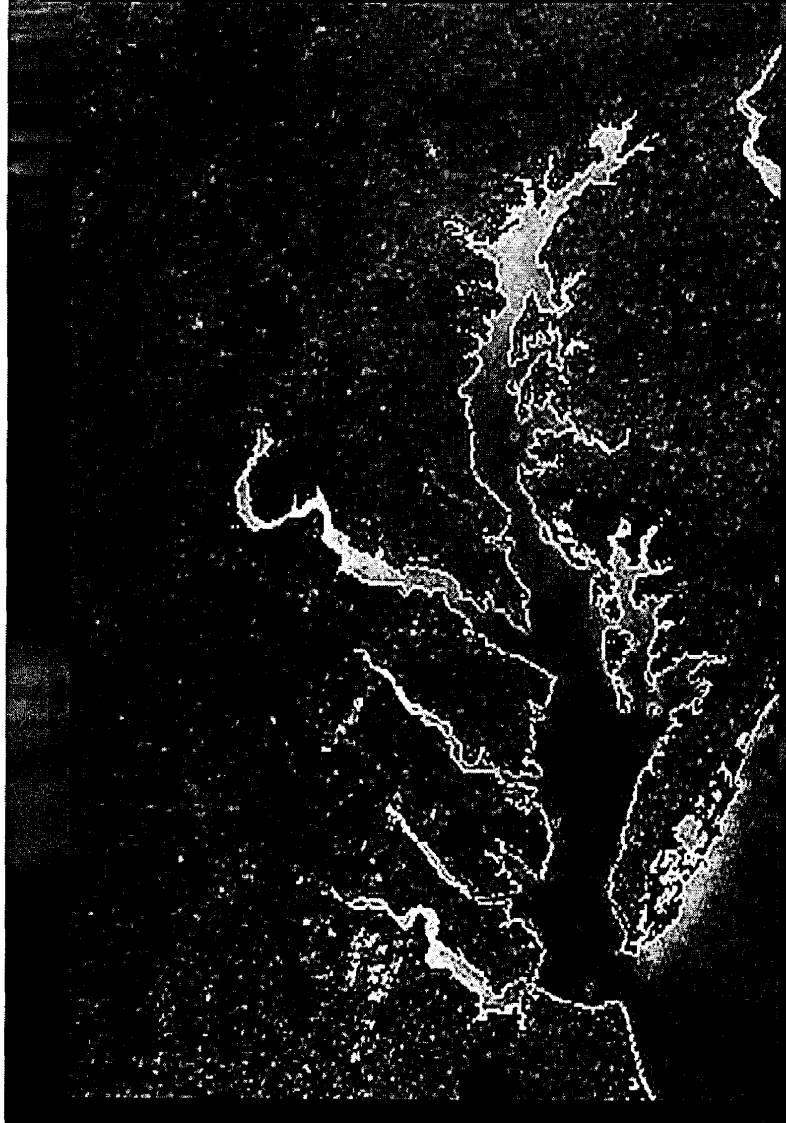
- Promote and Target Cost-Effective BMPs
- Expand Diet & Feed Management to 100 Dairy Operations (with VA Tech)
- Seek Increase In Poultry Phytase Use By Integrators
- Expand Poultry Litter Transport With Industry
- Alternative Use for Animal Waste
- Pilot Enhanced Nutrient Management (Yield Reserve)
- May Extend Contracts on Proven Cost-Effective Practices
- Employ New and Proven Approaches ("One Size Will Not Fit All")
- Improving Outreach to Farmers

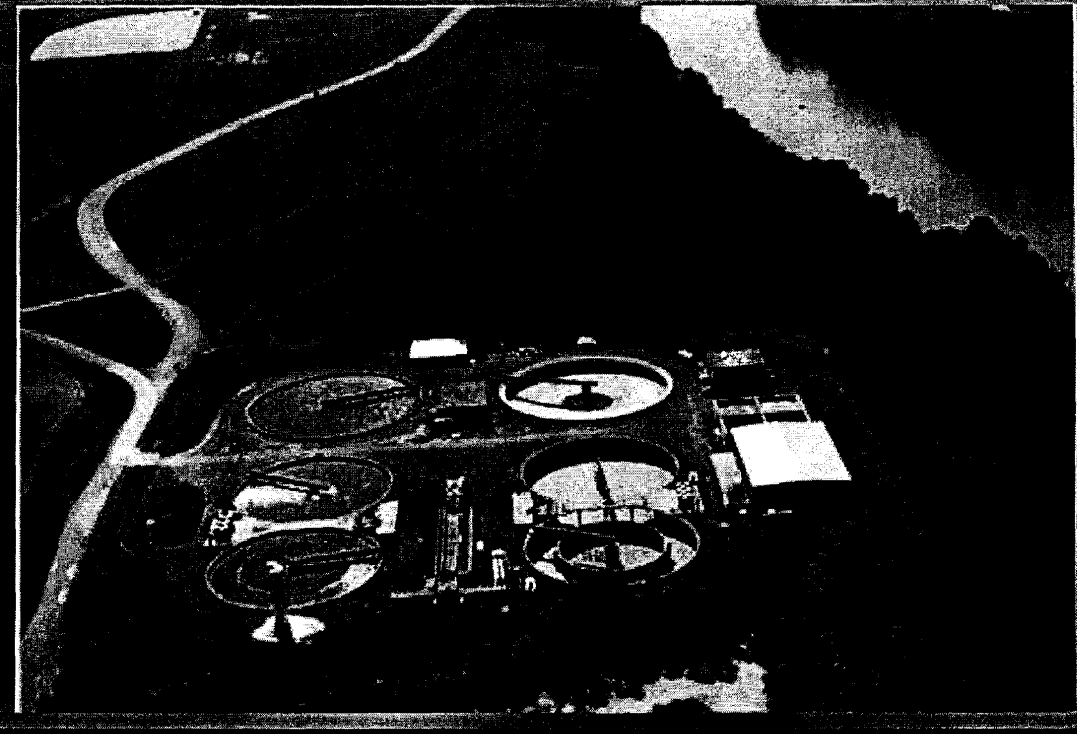
Keeping VA's Commitments

Long-Term NPS Goals Involve Several Actions:

- Getting as many conservation practices installed as possible between now and 2010
- NPS implementation & staffing will need significant ramping-up over the next 5 years
- Demonstrate to EPA that the mechanism is in place by 2010
- Completing the work to install practices by 2015
- Keeping the practices installed and effective in-the-field
- Requires on-going state funding beyond 2015
- Continued mix of voluntary incentives and regulatory programs

Virginia's Chesapeake Bay Watershed Point Source Nutrient Control Strategy





HJR 640 Committee

July 20, 2005 Meeting

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

APPENDIX L

Presentation Summary

- What Makes Up VA's Point Source Strategy?
  - VA Tributary Strategies
  - Point Source Regulations
  - Chesapeake Bay Watershed Nutrient Credit Exchange Program
  - Water Quality Improvement Fund

- How does this compare to the Chesapeake Bay Commission's Cost-Effective Strategies report?

Watershed Approach to Nutrient Reduction

- Virginia's Tributary Strategies define the necessary point and non-point source control actions
  - Developed based upon models and extensive stakeholder input
- Point source load allocations were based upon design flow capacity with stringent nutrient control technologies
  - Final implementation depends upon regulations being developed by the SWCB
- Remaining nutrient reductions in river basins need to be accomplished by non-point sources

Status of Regulatory Actions for Point Source Dischargers

Water Quality Management Planning Regulation – sets nutrient waste load allocations

Regulation for Nutrient Dischargers – sets technology-based nutrient concentration limits for certain discharges

- *Allocations are based upon stringent treatment levels*
- *State Water Control Board action expected fall 2005*

Watershed General Permit – authorizes discharge of nutrients from point sources and establishes trading program

- *Allows more cost-effective approach for meeting allocations*
- *State Water Control Board action expected by early 2006*

Chesapeake Bay Watershed Nutrient Credit Exchange Program (HB 2862 / SB 1275)

Legislative findings and purposes.

Adoption and utilization of a watershed general permit and market-based point source nutrient credit trading program will assist in:

(a) meeting the nutrient cap load allocations cost-effectively and as soon as possible in keeping with the 2010 timeline and objectives of the Chesapeake 2000 agreement,

(b) accommodating continued growth and economic development in the Chesapeake Bay watershed, and

(c) providing a foundation for establishing market-based incentives to help achieve the Chesapeake Bay Program's non-point source reduction goals.

Major Elements of Credit Exchange Program

- SWCB to issue "Watershed General Permit" containing nutrient waste load allocations for each significant discharger
- Allows trading within basins among facilities covered by WGP
- Provides additional options for new or expanding dischargers: acquire non-point source offsets and/or payment into WQIF
- Authorizes establishment of "Nutrient Credit Exchange Association" to assist dischargers

How will Credit Exchange Program improve cost-effectiveness?

- Phasing in treatment plant upgrades - not all plants need to construct facilities by 2010
- Avoid/delay less-efficient (i.e., higher cost per pound) upgrades
- Expanding and new plants may acquire non-point source offsets in lieu of excessive upgrade costs
- Avoid enforcement penalties through compliance alternative of acquiring credits from WQIF

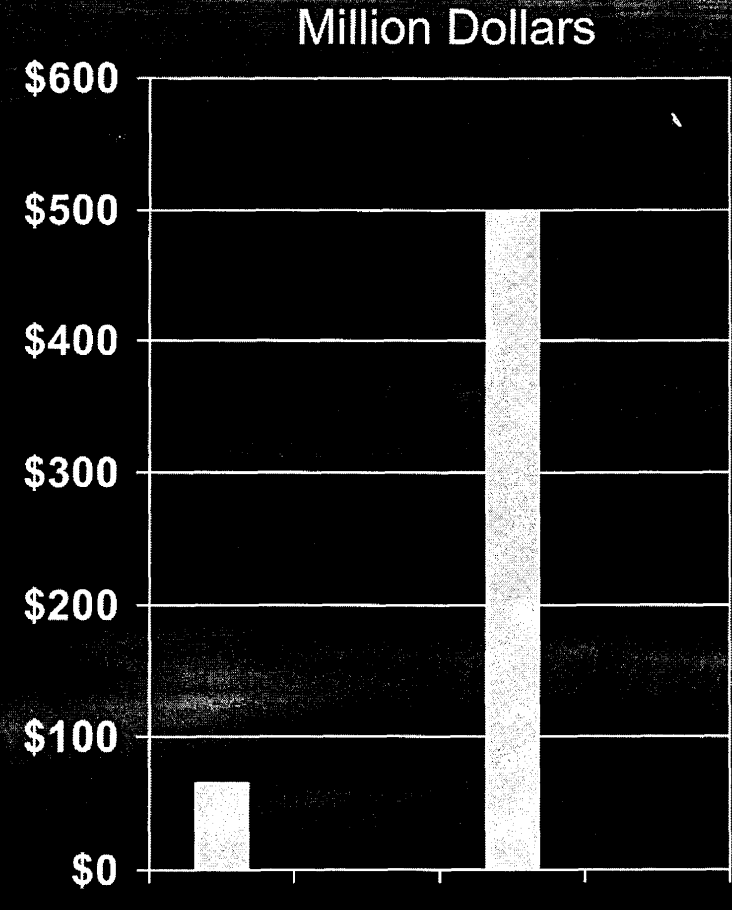
Water Quality Improvement Fund Needs

- Total point source capital need: $1.200 B
  - for 125 significant treatment plants
- POTW capital cost need: $1.111 B
  - for 103 publicly owned plants
- Variables Affecting Amount of Grant Funds Needed:
  - WQIF grant percentage varies: 35 to 75%
  - Planning cost estimates: could be higher or lower
  - Not all POTWs may need, or decide, to upgrade prior to 2010 to achieve loading goals
- Compliance Plans required under Watershed General Permit will clarify the funding needs and schedules
  - Plans available in 2006

Water Quality Improvement Fund Needs *[cont.]*

WQIF funds available in FY06 = $65.7 million

WQIF funds needed to upgrade treatment plants ~ $500 million



How Does VA's Point Source Strategy Compare to Commission's Report?

Strategy is Consistent

- Relies on widespread installation of stringent nutrient removal technologies, recognizing regional needs
- Calls for operation of installed facilities at design efficiencies
- New credit exchange program provides cost-effective options that avoid the most technically difficult retrofits

CAPITAL COST FOR NUTRIENT REMOVAL AT VIRGINIA CHESAPEAKE BAY WATERSHED WASTEWATER TREATMENT PLANTS

River Basin	TOTAL CAPITAL COST
Shenandoah	$139,400,000
Potomac	$359,100,000
Rappahannock	$106,900,000
York	$88,180,000
James	$493,200,000
Eastern Shore	$13,700,000
TOTAL =	$1,200,480,000

Shenandoah Basin Facility	TOTAL CAPITAL COST
Berryville	$3,113,000
Coors	$12,410,000
Fishersville	$4,995,000
Front Royal	$4,840,000
FWSA-Opequon	$6,390,000
Georges Chicken	$1,003,000
INVISTA-Waynesboro	$0
Luray	$3,360,000
Massanutten	$2,095,000
Merck	$800,000
Middle River	$10,290,000
Mt. Jackson	$4,134,000
New Market	$3,852,000
North Fork Regional	$2,622,000
North River	$21,530,000
Parkins Mill	$9,523,000
Pilgrims Pride-Alma	$6,600,000
SIL MRRS	$2,460,000
Stony Creek	$4,134,000
Strasburg	$2,928,000
Stuarts Draft	$4,995,000
VPG-Hinton	$7,809,000
Waynesboro	$8,773,000
Weyers Cave	$3,852,000
Woodstock	$6,875,000
TOTAL =	**$139,400,000**

Potomac Basin Facility	TOTAL CAPITAL COST
Alexandria S.A.	$69,130,000
Aquia	$12,000,000
Arlington	$51,590,000
Blue Plains (VA Share)	$110,500,000
Broad Run	$29,250,000
Colonial Beach	$3,625,000
Dahlgren S.D.	$1,643,000
DSC #1	$1,060,000
DSC #8	$1,060,000
Fairview Beach	$1,206,000
HL Mooney	$11,130,000
Leesburg	$11,090,000
Noman-Cole	$15,340,000
NSWC-Dahlgren	$2,753,000
Purcellville	$1,112,000
Purkins Corner	$2,600,000
Quantico	$4,248,000
Round Hill	$4,152,000
UOSA	$22,600,000
Vint Hill	$3,002,000
-	
TOTAL =	**$359,100,000**

Rappahannock Basin Facility	TOTAL CAPITAL COST
Clevengers (South Wales)	$3,595,000
Culpeper	$6,802,000
FMC	$8,256,000
Fredericksburg	$6,160,000
Ft. A.P. Hill	$1,541,000
Haymount	$4,012,000
Haynesville	$2,989,000
Hopyard Farms	$1,359,000
Kilmarnock	$3,036,000
Little Falls Run (Stafford)	$4,769,000
Marshall	$3,291,000
Massaponax	$11,510,000
Mont.-Westmoreland	$2,647,000
Mountain Run	$4,179,000
Oakland Park	$3,012,000
Omega Protein	$11,070,000
Orange	$6,179,000
Rapidan	$3,291,000
Reedville	$3,005,000
Remington	$1,637,000
Tappahannock	$1,973,000
Urbanna	$2,722,000
Warrenton	$2,205,000
Warsaw	$3,287,000
Wilderness Shores	$4,417,000
TOTAL	**$106,900,000**

York Basin Facility	TOTAL CAPITAL COST
Ashland	$2,591,000
Caroline Co.	$3,852,000
Doswell	$6,860,000
Giant Refinery	$3,500,000
Gordonsville	$5,067,000
HRSD-York	$37,200,000
Mathews CH	$2,647,000
Parham Landing	$9,490,000
Smurfit Stone	$2,000,000
Totopotomoy	$7,755,000
West Point	$7,222,000
TOTAL =	**$88,180,000**

JAMES BASIN Facility	TOTAL CAPITAL COST
Alleg. Co.-Lower Jackson	$4,678,000
Amherst	$847,200
Brown & Williamson	$2,066,000
Buena Vista	$5,491,000
BWXT	$1,000,000
Chickahominy WWTP	$4,111,000
Clifton Forge	$5,221,000
Covington	$6,296,000
Crewe	$3,739,000
Dominion-Chester	$0
DuPont-Spruance	$0
Falling Creek	$5,994,000
Farmville	$4,679,000
Ga. Pacific Corp.	$3,325,000
Grief Bros., Inc	$3,325,000
Henrico Co.	$25,300,000
Honeywell-Hopewell	$0
Hopewell (1)	$59,370,000
HRSD-Army Base	$37,100,000
HRSD-Boat Harbor	$79,700,000
HRSD-Ches/Eliz	$0
HRSD-James River	$60,800,000
HRSD-Nansemond	$23,500,000
HRSD-VIP	$5,000,000
HRSD-Williamsburg	$4,600,000
J.H. Miles	$0
Lake Monticello	$3,961,000
Lees Comm. Carpet	$2,174,000
Lex-Rockbridge Reg.	$2,890,000
Low Moor	$3,213,000
Lynchburg (3)	$54,480,000
Phillip Morris	$11,500,000
Powhatan Cor. Center	$3,115,000
Proctors Creek	$1,500,000
Richmond (3)	$32,050,000
RWSA-Moores Creek	$18,260,000
South Central	$12,100,000
Tysons-Glen Allen	$150,000
WestVaco-Covington	$1,644,000
TOTAL	**$493,200,000**

Eastern Shore Basin Facility	TOTAL CAPITAL COST
Cape Charles	$3,852,000
Onancock	$3,146,000
Shore Health Services	$2,722,000
Tangier Island	$2,722,000
Tyson Food-Temperanceville	$1,257,000
TOTAL =	**$13,700,000**

Restoration of the Chesapeake Bay and Tributary Rivers - Legal Obligations -

Chesapeake Bay Restoration Funding Committee (HJR 640)

Department of Environmental Quality
September 29, 2005

Sources of Requirements and Commitments

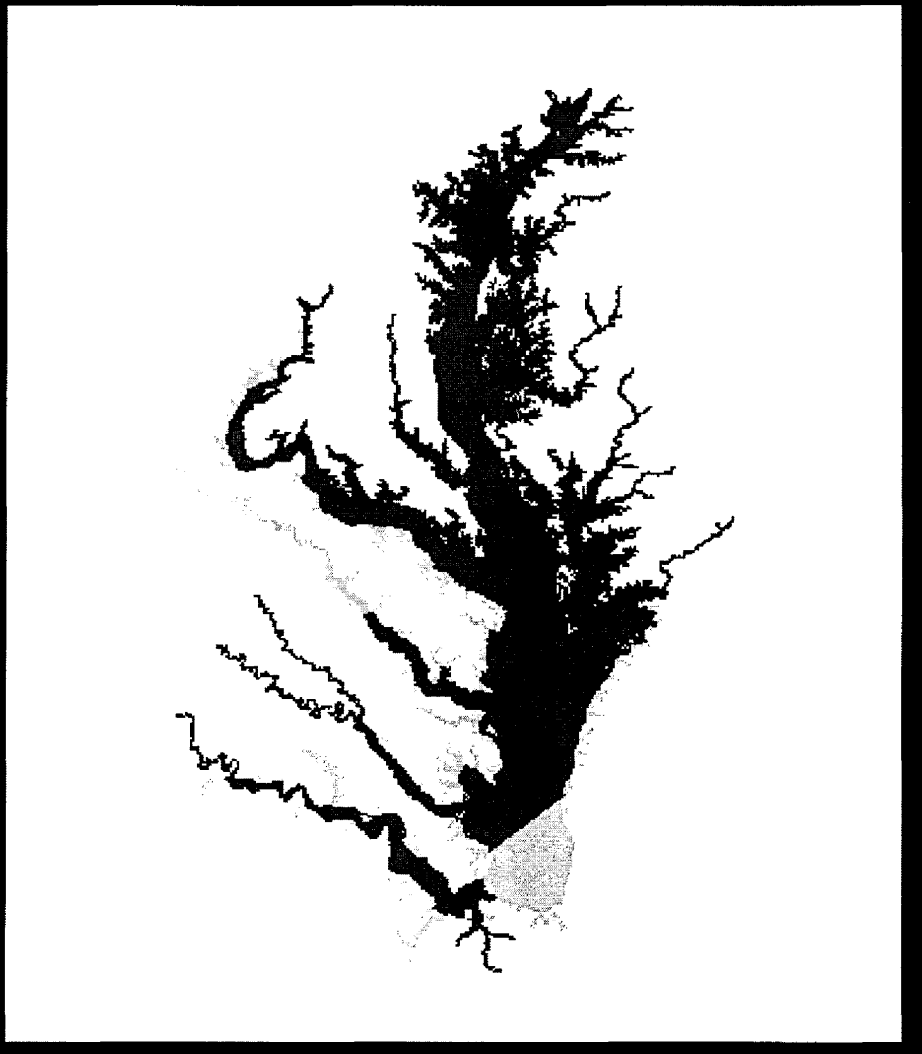
- State Water Control Law
- Federal Clean Water Act
- American Canoeist Association vs. EPA Consent Decree
- Chesapeake Bay 2000 Agreement

Major portions of the Chesapeake Bay and its tidal rivers are listed under the Clean Water Act as "impaired waters", due to one or more of the following problems:

→ ***low dissolved oxygen levels***

→ ***poor water clarity***

→ ***algae bloom conditions and poor quality fish food***



☐ Impaired Water ■ Unimpaired Water

Water Quality Standards

§303 Clean Water Act, § 62.1-44.15 Code of Virginia

- Water Quality standards must protect all beneficial uses
  - public water supplies, fish and wildlife, recreation, and the production of marketable fish and shellfish
  - Reviewed every 3 years to determine if standards are appropriate
  - Standards must be approved by EPA
- When existing standards are not adequate to protect these beneficial uses, new standards must be adopted
  - The State Water Control Board is adopting new standards to protect the Bay from excess nitrogen and phosphorous
- All permits for discharges of waste water must be consistent with these water quality standards once adopted

Total Maximum Daily Loads

§303 Clean Water Act, §62.1-44.19:7 Code of Virginia

- A TMDL identifies the amount of a pollutant a water body can assimilate without violating water quality sources and allocates those loads between point and nonpoint sources
- A TMDL must be prepared for each water that is listed as impaired
- EPA Consent Decree (American Canoeists v EPA) requires that Virginia complete a TMDL for the Bay or that the Bay meet water quality standards by 2010
  - EPA is required to complete a TMDL by 2011 if this is not done

Chesapeake 2000 Agreement

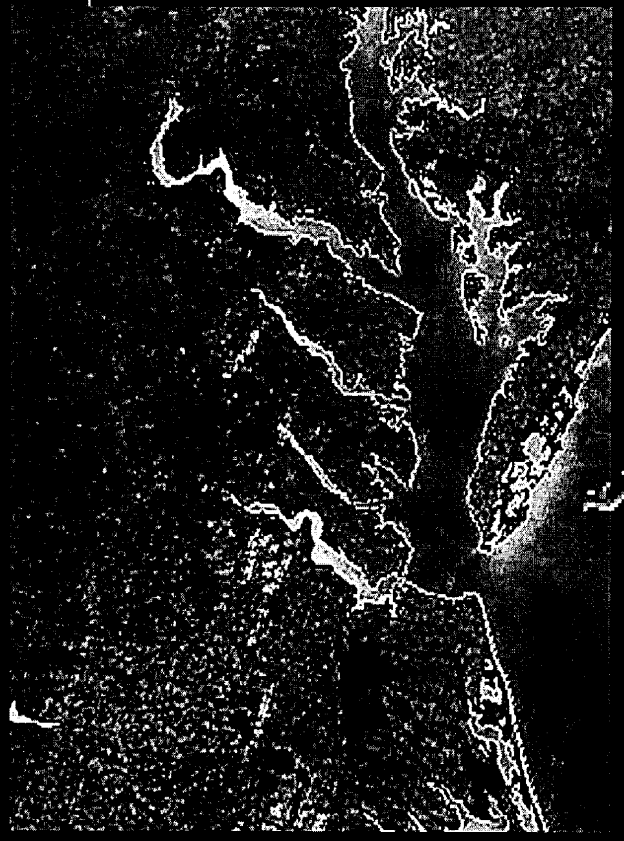
- Chesapeake Bay Watershed states agreed to work towards restoring the Chesapeake Bay so that it could be de-listed by 2010
  - The agreement is authorized by § 30-225 of the Code of Virginia
  - Signed by the Governor and the Chair of the Virginia Chesapeake Bay Commission
  - All states are working towards this goal, but the Agreement does not create any legal consequences if the Bay is not restored by 2010

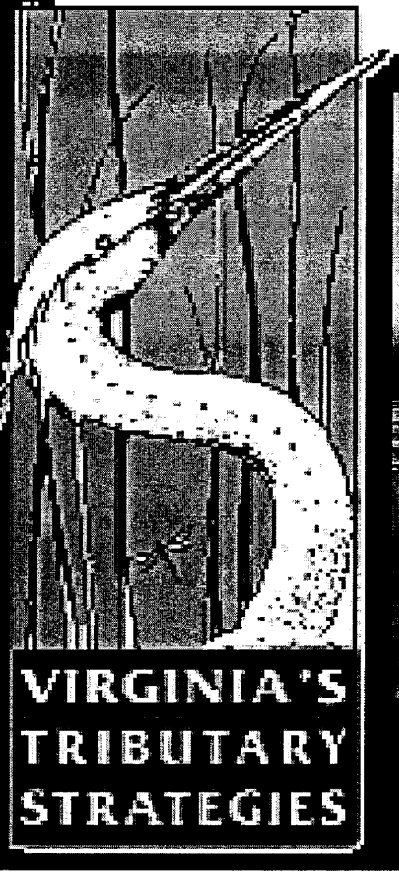
Virginia is required to....

- Adopt standards to protect Bay and Tributary Resources from excess nutrients
  - will be completed in 2005
- Adopt a TMDL or delist the Bay by 2010
  - Chesapeake 2000 Agreement means all states are working towards restoration and delisting of the Bay
  - Current efforts to adopt standards and allocate waste-load may meet the requirements for a TMDL
- Issue permits consistent with those standards and allocations
  - Will start with issuance of Watershed General Permit in 2006
  - Anticipate that most significant dischargers will need to upgrade between 2006 and 2015.

Estimated Needs: Water Quality Improvement Fund 07-08 Biennium

Russ Baxter
Assistant Secretary of Natural Resources





APPENDIX O

Overview of this Presentation

- Estimated FY 07-08 Point Source Needs
- Estimated FY 07-08 Nonpoint Source Needs
- Total Estimated Needs

Water Quality Improvement Act

10.1-2131(b) The Director of the Department of Environmental Quality shall enter into grant agreements with all facilities designated as significant dischargers that apply for grants....

10.1- 2128(b)....it shall be the policy of the General Assembly to provide annually its share of financial support to qualifying applicants for grants...

Planning for Point Source Upgrades

- Preliminary plans and schedules are expected by December 2005 from Virginia Nutrient Credit Exchange Association.

- Chesapeake Bay Watershed Nutrient Credit Exchange Program compliance plans with construction schedules in 2006.

Point Source Compliance Plans

General Permits shall contain:

"A requirement that within nine months after the initial effective date of the general permit, the permittees shall either individually or through the Association submit compliance plans to the Department for approval. The compliance plans shall contain, at a minimum, any capital projects and implementation schedules needed to achieve total nitrogen and phosphorus reductions...."

(§ 62.1-44.19:14 (C) (3))

TOTAL ESTIMATED POINT SOURCE WQIF NEEDS (State Share)

$555,000,000

2007-08 POINT SOURCE NEEDS ESTIMATE

- 3 Projects Currently underway: Arlington County, Loudoun County (Broad Run), and Dahlgren SD. Estimated $40 million

- Estimated 46 Projects Needed by 2010 Estimated $150 million - $190 million

Total Estimate of WQIF funds needed for point source upgrades during the FY07-08 biennium:

Total WQIF by June 30 2008:	$190 - 230 million
FY06 deposit to WQIF:	- $ 66 million
FY07- 08 WQIF:	$124 - 164 million

The Fine Print: Point Sources

** by December 2005 a more accurate estimate of the grant funding needs is expected when the Virginia Nutrient Credit Exchange Association grant project is completed.*

** final regulatory action by the State Water Control Board is expected later this year that will set the nutrient load allocations for all significant dischargers which may change estimates*

Non Point Source Needs:
FY 07: $39.5
FY 08: $50.6

Focus Areas:
Agricultural BMP Cost Share (CB)
Agricultural BMP Cost Share (SR)
CREP Program
WQ Initiative Projects (CB and SR)
Local Governments Grants (CB and SR)

CB: Chesapeake Bay Watershed
SR: Southern Rivers Watershed

The Fine Print: Nonpoint Sources

* *Ability to put money "on the ground" will depend on additional trained personnel at Soil and Water Conservation Districts, DCR and other agencies*

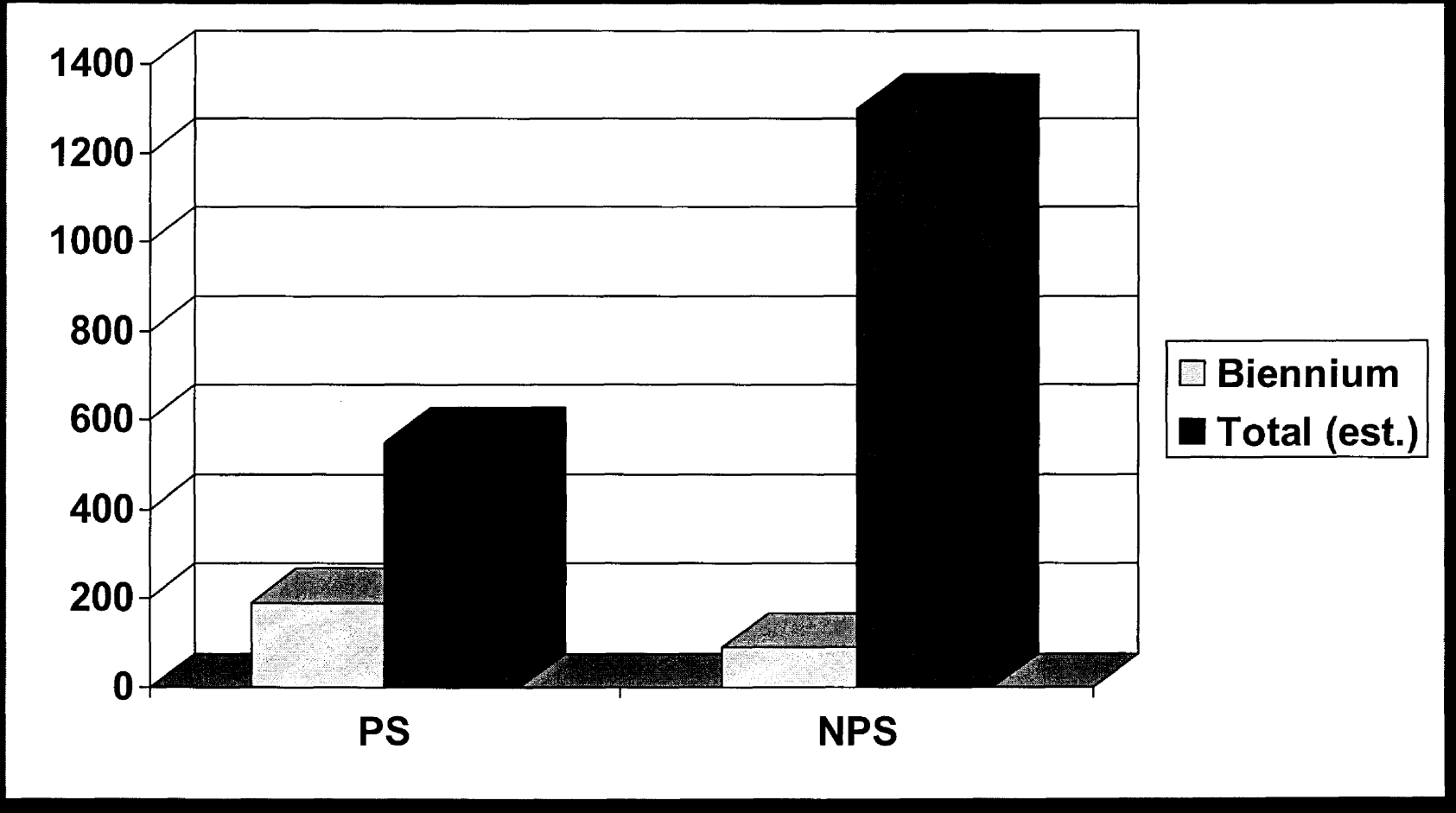
* *Progress will depend on sustained funding, "feast and famine" approach will hinder progress*

ESTIMATED NEEDS
FY 07-08
(IN MILLIONS)

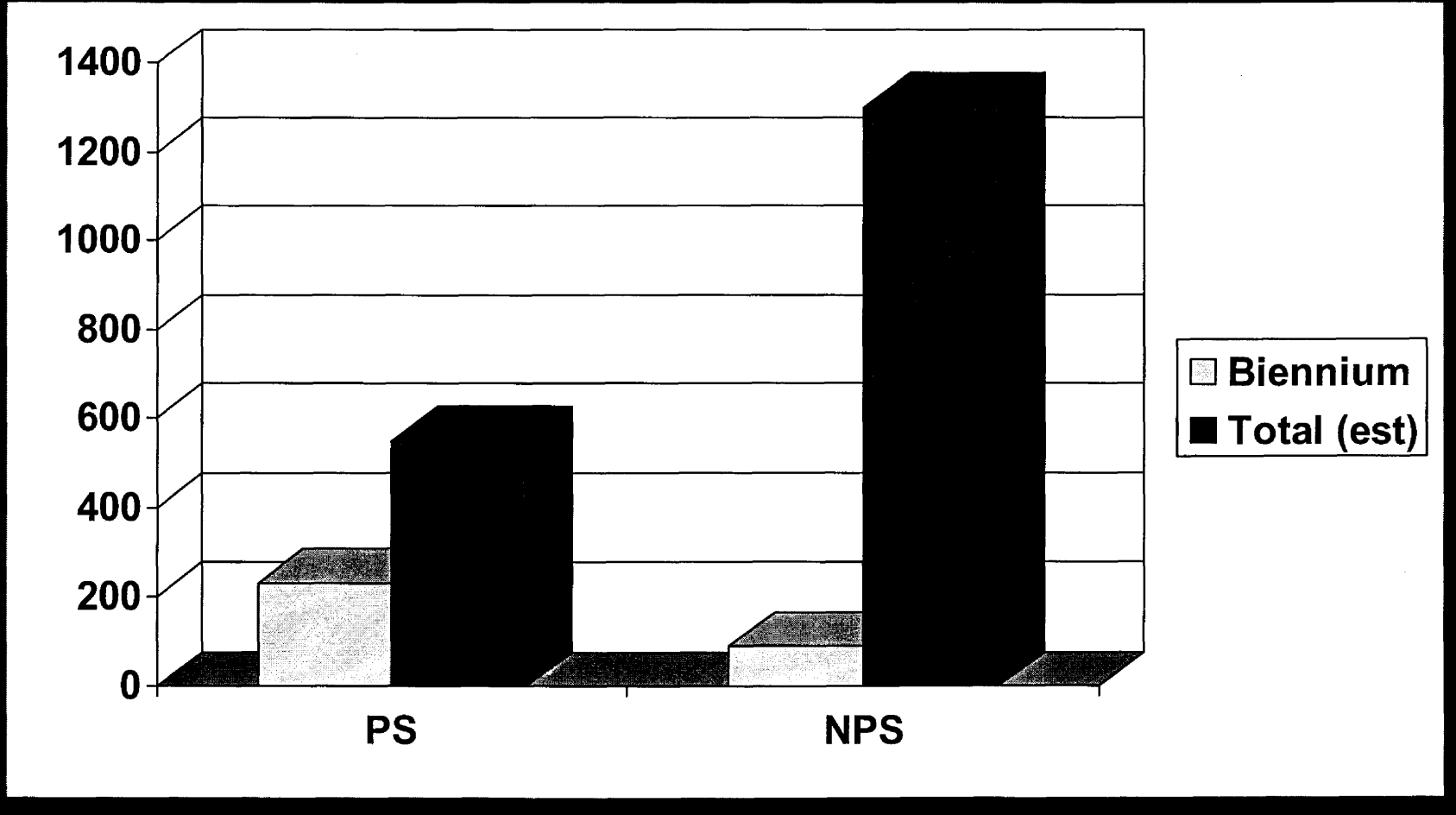
POINT SOURCE (est.)	**$ 124 - 164**
NONPOINT SOURCE	**$ 90**
TOTAL (est.)	**$ 214 – 254***

* Additional funds may accelerate implementation particularly for point sources

Funding Progress ($124 million PS)



Funding Progress ($164 million PS)



Summary: FY 07-08 Estimated Needs (millions)

POINT SOURCE (est.)	$ 124 - 164
NONPOINT SOURCE	$ 90
TOTAL (est.)	**$ 214 – 254**

Joint Subcommittee to Study Options to Provide a Long-term Funding Source to Clean up Virginia's Polluted Waters, Including the Chesapeake Bay and its Tributaries (HJR 640)

Virginia Division of Legislative Services
September 29, 2005

1

Cost Sharing Borne by the Commonwealth

- State funding for cleanup of Virginia's waters is driven by the costs to be paid by the Commonwealth.

  Δ Under current cost-sharing policies the Commonwealth is responsible for 50 percent (on average) of point source cleanup costs (waste water treatment plants) and 75 percent of nonpoint source cleanup costs (pollution relating to agriculture and stormwater management).

  Δ Current cost-sharing policies hold the Commonwealth responsible for $2.34 billion of the total estimated $12.5 billion cost for cleanup of Virginia's waters.

Current Sources of Funding

- Currently 10 percent of the annual revenue surplus and 10 percent of the annual unreserved general fund balance is deposited into the Virginia Water Quality Improvement Fund (WQIF).

  - Δ Deposits from the surplus and unreserved general fund balance totaled $7.7 million in Fiscal Year 2005 and $32.4 million in Fiscal Year 2006.

- Additional non-surplus appropriations have been made to the WQIF.

  - Δ An additional $15 million in Fiscal Year 2005 and $65 million in Fiscal Year 2006 from the general fund was deposited into the WQIF.

- If there are changes to the sources of funding, will this impact the current dedicated funding from the surplus and unreserved general fund balance?

Funding Considerations – Threshold Questions

- What is the target level of funding? How is this allocated between point and nonpoint sources of pollution?
- Should just general funds be used for funding cleanup of Virginia's waters? This is the current method of funding.
- Should one or more specific, current revenue sources (e.g., all or portions of insurance license taxes, recordation taxes, sales taxes, current fees, etc.) be dedicated for the cleanup of Virginia's waters?
- Should a new or higher tax, fee, or other charge be imposed with the resulting revenue dedicated for cleanup purposes?
- Should funding be a combination of the foregoing?
- What role should bonds and leveraged financing play?

Funding Sources – Criteria Considerations

- Some or all of the following criteria may be used in considering funding sources:

1. The nexus between the source of funding and the use of the funds;
2. The ease of collection;
3. The breadth of applicability to the general public;
4. The stability of the funding source;
5. The amount of revenue generated;
6. The ease of understanding; and
7. Practical feasibility.

Governor's Natural Resources Funding Commission

- The Governor's Natural Resources Funding Commission recommended $27 million in additional general funds in Fiscal Year 2006 for natural resources funding.
- The Commission recommended that appropriations for natural resources should be no less than 1 percent of total appropriations.
- The Commission also recommended two new nongeneral fund sources of revenue for natural resources funding:
  - Δ A $2 per month water utility fee for each customer collected by waterworks companies ($45.9 million per year); and
  - Δ A $10 document recording fee on deeds and court judgments ($20 million per year). A $10 document recording fee was included in the 2002 budget bill but revenues were deposited into the general fund.

Governor's Natural Resources Funding Commission

- The Commission undertook a full evaluation and discussion of 3 other new nongeneral fund sources of revenue.

  Δ The Commission did not reach a consensus on the following 3 funding mechanisms:

  1. A $3 per ton tipping fee on municipal solid waste imposed on landfill operators ($36 million per year);

  2. A $0.006 per gallon petroleum fee on fuel sold in the Commonwealth ($36 million per year); and

  3. A $2 per month electric utility fee for each metered and nonmetered account collected by electricity distributors ($75.3 million per year).

Other Funding Mechanisms for Possible Consideration

- Some funding mechanisms for possible consideration include dedicating specific, current revenues for cleanup of Virginia's waters.

  Δ The year-to-year growth in recordation tax revenues has averaged about $60 million for the past decade.

  Δ State Corporation Commission license tax revenues from farmowner, homeowner, and commercial multi-peril insurance policies are approximately $42.7 million per year.

  Δ House Bill 2777 and Senate Bill 1235 (2005) would have dedicated for water cleanup one-twelfth of the revenue (up to $160 million a year) from the 2 percent sales tax currently deposited into the general fund.

Other Funding Mechanisms for Possible Consideration

- Other mechanisms for possible consideration include new taxes, fees, surcharges, etc.

  Δ Insurance premiums collected from farmowner, homeowner, and, commercial multi-peril policies were approximately $1.9 billion in 2004. Each 1 percent charged to insured persons on these premiums would generate $19 million per year. Insurance companies could collect the new charges.

  Δ A sliding scale higher capital gains tax could be imposed on gains from the sale of certain real estate. The scaled tax would depend on the percentage size of the gain and the length of the holding period. The sale of certain real estate such as the taxpayer's personal residence and certain farms could be excluded.

  This would be similar to the capital gains tax proposed in HB 1782 (1989).

Cleaning Up the Bay

Challenges and Solutions

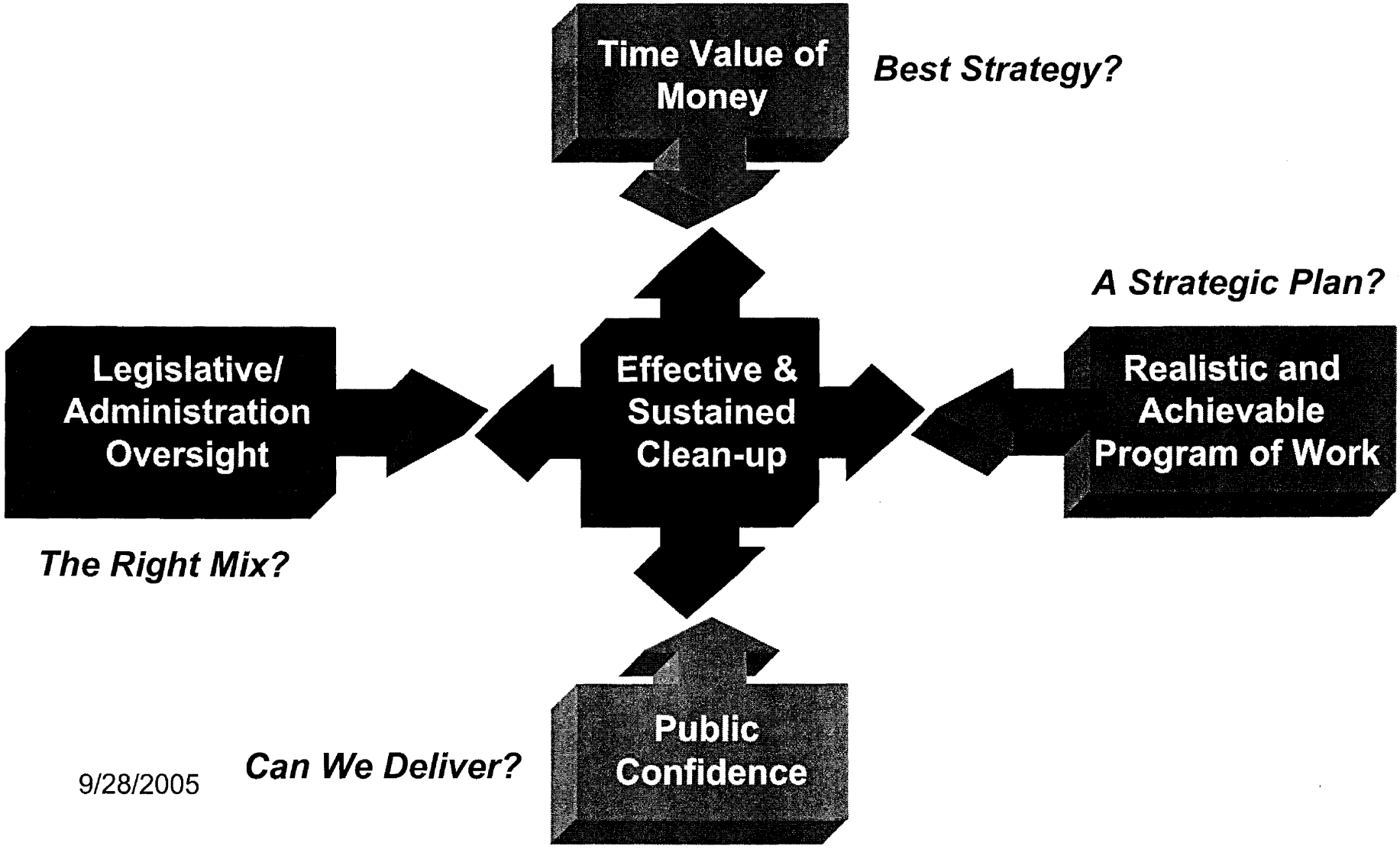
Delegate L. Scott Lingamfelter

9/28/2005

The Challenge

- Complex body of work
- High cost
- Multiple stake-holders
  - Echelons of government (federal – state – local)
  - Several agencies (federal & state)
  - Special interests (public & private)
  - Scientific community (environmental vs. business)
  - Utility community (big & small)
  - Policy and oversight community (General Assembly & The Administration)
- Public confidence to orchestrate complex projects

Effective & Sustained Clean-up



Programmatic Risk Mitigation

The Elements…

- Effective Oversight
- Engaged executive staff
  - Focused on planning and execution
  - Cuts across bureaucracies
  - Empowered to be effective
  - Answers directly to oversight body
- Strategic plan that links state and local priorities of work
- Finances tied to the program of work

Project Planning Principles

- Develop phases to meet attainable goals
  - Do not tie phases to "2010"
- Link state and local efforts
- Prioritize work within phases to meet phased objectives
- Align funding to phases

Project Funding Principles

- Request in each biennium only those funds that can be realistically expended based on a defined program of work
  - Number of projects that can actually be undertaken
  - Account for industrial capacity to do the work
- Prioritize funding on projects that get the "most bang for the buck"

Clean-up By Phase (Notional)

Phase 1

Begin Program of Work to restore the Bay to a level where it's natural recuperative abilities are carrying 50% of the restoration load

Phase 2

Begin Program or Work to set in place additional sustaining strategies to meet C2K Objectives

Phase 3

Begin Program or Work to maintain the Bay C2K objectives with BMP's that mitigate growth impacts

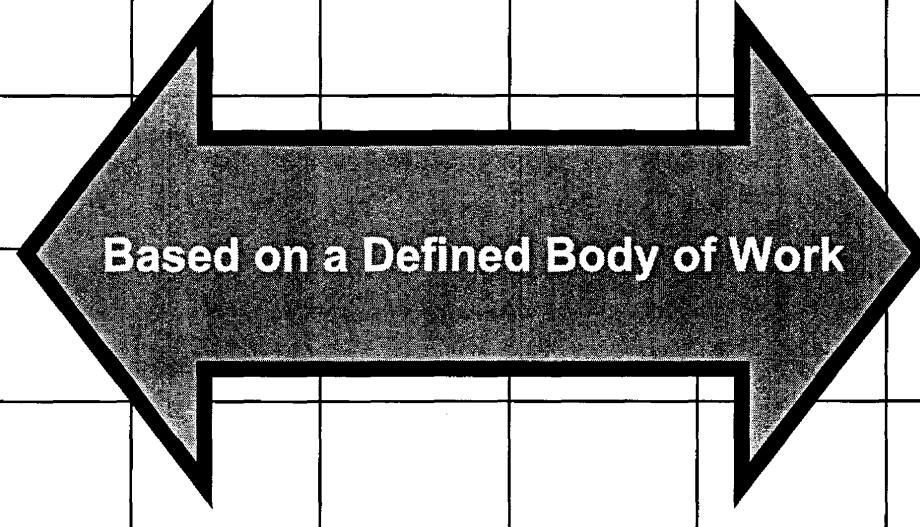
9/28/2005

Program of Work (Notional)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Point Source	▲Plant "A" ▲Plant "B" ▲Plant "C" ▲Plant "D" ▲Plant "E" ▲Plant "F"	▲Plant "G" ▲Plant "H" ▲Plant "I" ▲Plant "J"	Show the plants that will be upgraded in each FY		
Ag BMP	District 1: 33 District 2: 41 District 3: 109	District 1: 43 District 2: 57 District 3: 50	Show BMPs projects by planning district in each FY		
Non-Ag BMP	District 1: 201 District 2: 58 District 3: 75	District 1: 245 District 2: 66 District 3: 31	Show BMPs projects by planning district in each FY		
Stream/River BMPs 9/28/2005	District 1: 15 District 2: 22 District 3: 32	District 1: 70 District 2: 56 District 3: 82	Show BMPs projects by planning district in each FY		

Program of Work Funding (Notional)

	Total Cost	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011
Point Source	$500M						
Ag BMPs	$580M						
Non-Ag BMPs	$660M						
Stream/River BMPs	$600M						
Total	$2.34B						



Chesapeake Bay Clean-up Authority

- **Membership**
  - Course of Action 1: legislators, executive branch officials, and civilians with pertinent expertise
  - Course of action 2: civilians with pertinent expertise
- **Staffing**
  - An Executive Director with a strong background in business finance and program management of programs in excess of $1 billion
  - Staff of 5 composed of:
    - Finance director
    - Marine scientist
    - Civil engineer (emphasis on construction)
    - Agronomist (trained in soil management)
    - Hydrologist

9/28/2005

Responsibilities

- Develop "Chesapeake Bay Clean-up Strategic Plan" through Department of Environmental Quality
- Oversee execution of the plan, including approval of any alterations or modifications
- Report regularly to the oversight authority
- Develop and issue "Annual Report on Clean-up Progress"
- Recommend legislative actions

Bonding Capacity

- Commonwealth's current annual debt capacity is $670 million per year
- Commonwealth limited to $250 million per year for 10 or 20 year bonds
- $250 million would represent 40% of annual capacity

Authority Bonding Plan

- Issue up to $1 billion in bonds through the State Treasurer over a 10-20 year period
  - 50% for point source (matching grants with localities)
  - 50 % for non-point source (program of work as defined by the Authority
- 10-Year Scenario: Debt Service $1.32 billion
- 20-Year Scenario: Debt Service $1.64 billion
- Debt service on the bonds to be paid through a dedicated portion of the recordation tax revenue and $50 million/year from the GF (2005 Agreement)
- 2005 Agreement would be extended through bond pay-off

9/28/2005

Debt Service

10 Year Scenario: (5.25%)		20 Year Scenario: (5.25%)	
– Year 2:	$33 million	– Year 2:	$20.5 million
– Year 3:	$66 million	– Year 3:	$41 million
– Year 4:	$99 million	– Year 4:	$61.5 million
– Year 5-11:	$132 million/year	– Year 5-21:	$82 million/year
– Year 12:	$99 million	– Year 22:	$61.5 million
– Year 13:	$66 million	– Year 23:	$41 million
– Year 14:	$33 million	– Year 24:	$20.5 million
Total	$1.32 billion	Total	$1.64 billion

$50 million per year commitment (2005) extended to bond pay-off leaving…

△ of $620 million

△ of $440 million

9/28/2005

Conclusion

- Clean-up Authority is needed to focus the work, facilitate accountability, and ensure the public trust that a large financial commitment is spent wisely
- Bonding permits a major infusion of "up-front" money to address point source improvements and non-point source initiatives
- Both send a clear message that Virginia has a plan to get there and the funding commitment to deliver the product

Options for Clean Up of State Waters

A Presentation to the Joint Subcommittee to Study Options to Provide a Long-Term Funding Source to Clean Up Virginia's Polluted Waters, Including the Chesapeake Bay and its Tributaries

September 29, 2005

David W. Schnare, Esq. Ph.D.
Thomas Jefferson Institute for Public Policy

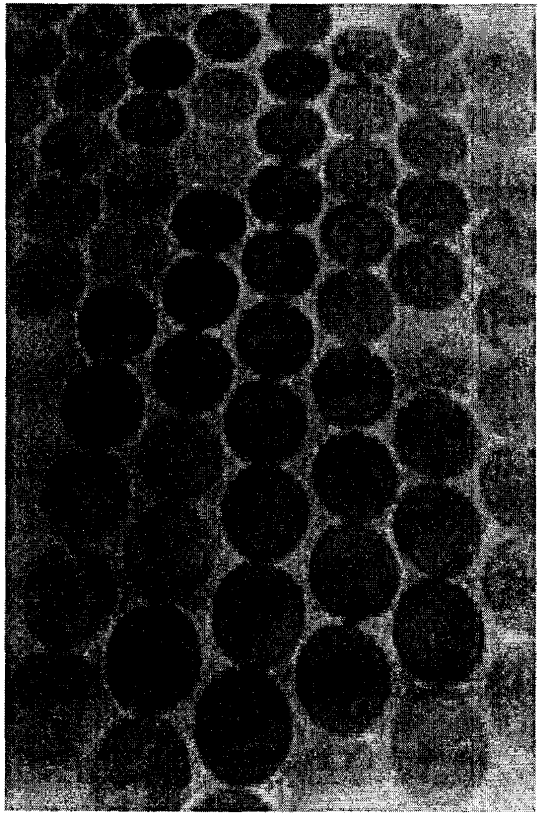
Three Themes --

- We know more than we realize but perhaps still don't know as much as we need to.
- We rely very heavily on mathematical models and perhaps not enough on empirical information.
- A free market and the profit motive have produced the least expensive, most effective solutions available.

Four Examples –

- Point source control through spray irrigation
- Litter Phosphorus control by ProAgri™
- Nitrogen control by urban lawn regulation and nutrient reduction markets
- Sediment, Phosphorus & Nitrogen control by continuous no till agronomy

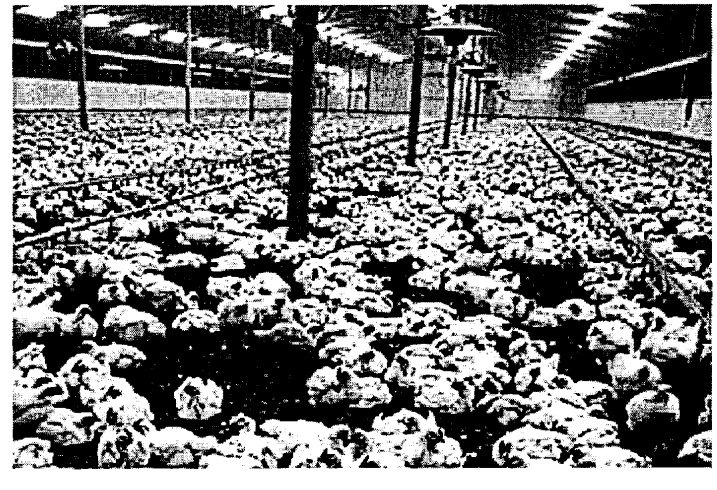
Point Source Control by Spray Irrigation



- Returns nutrients to crops.
- Costs of nutrient reduction are one-half the cost of chemical advanced water treatment.
- Useful in small and some medium sized municipalities in rural settings.

Chicken Litter Phosphorus Control

- Proprietary silica blend (ProAgri™) allows for designer fertilizer for field application of litter.
- 87% Phosphorus reduction with Nitrogen reduced or left available for use.
- 3 % increase in yield (lower bird losses & higher bird weight)
- 50% reduction in litter moisture
- 50% reduction in litter volume
- Reduces ammonia & dust



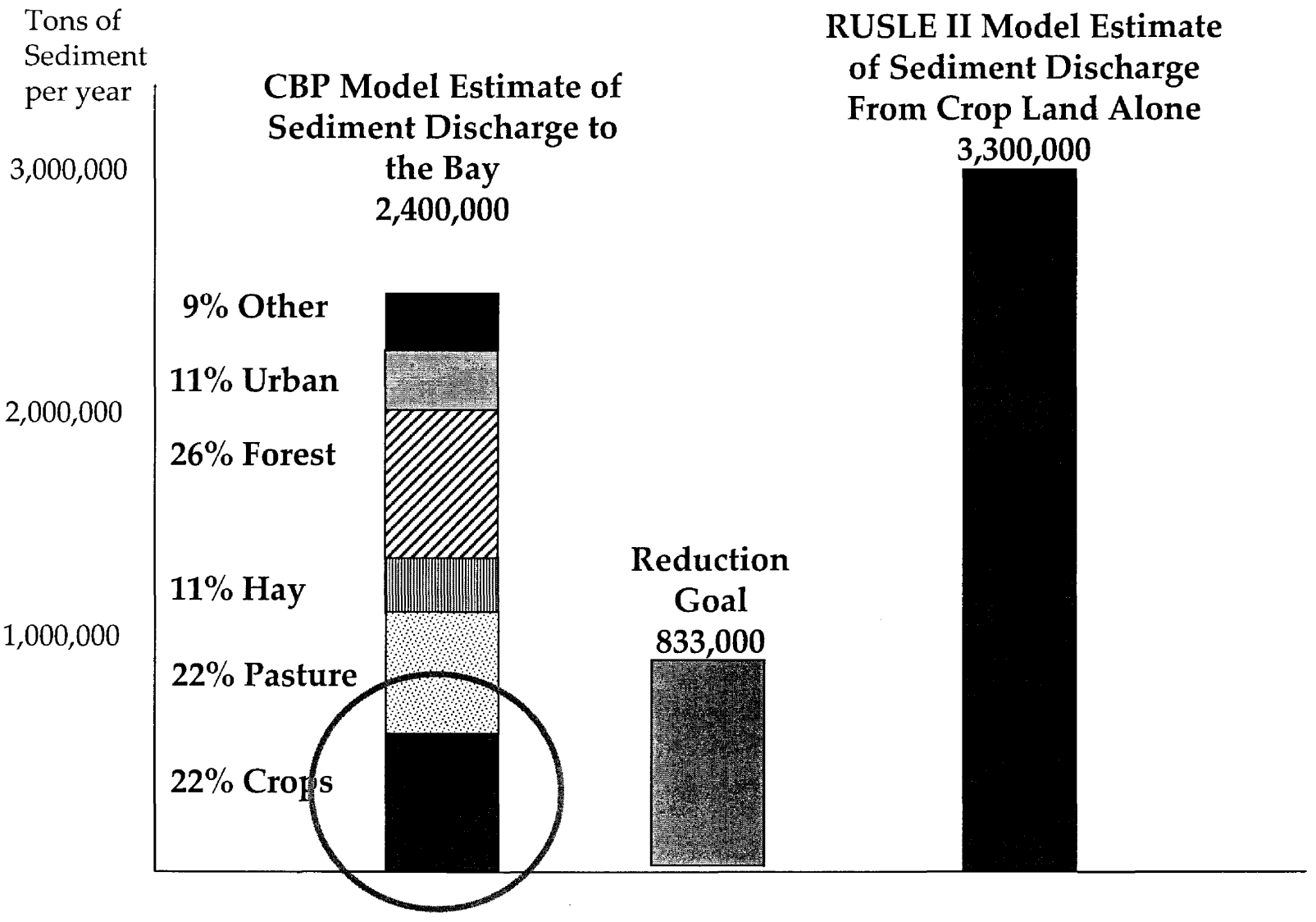
Lawn Fertilizer – Capturing the Market Externality

- Banning urban lawn fertilizers would produce 24% of the nitrogen reduction goal.
- Lawn fertilizers, unlike every other major source of nutrients, produce no economic crop.
- Option 1 - Ban lawn fertilizers, with an exception for "purchased nitrogen reduction from other sources".
- Option 2 – Tax lawn fertilizer ($5/lbs N), with tax to fund urban waste water treatment.

Continuous No Till Agronomy

- **USDA RUSLE II: Representative soils used for crop production without tillage with a corn, small grain and double crop rotation (3 crops over 2 yrs) up to a 9% slope with a 200 ft. length of slope indicate a sediment discharge of zero.**
- **Increases in yields**
- **Lower fuel and fertilizer costs**
- **Single tractor requirement (reduced from two and a smaller vehicle)**
- **Less time in the field**

Sediment



Schnare & Associates

Table D-1. Input Deck, James

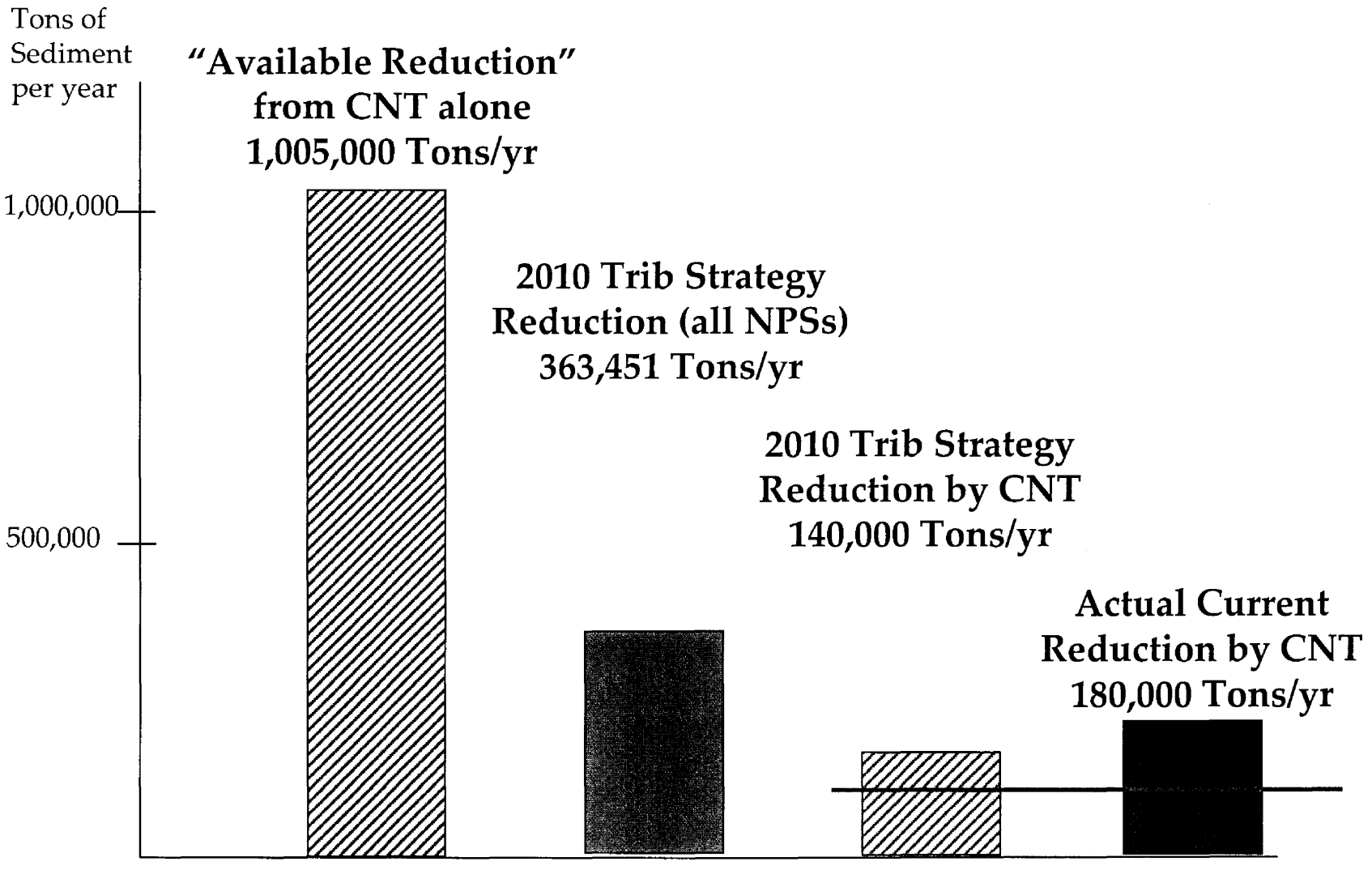
Lower James Basin	Land Use	Available Units	2002 BMP Progress	2010 BMP Goal	Remaining BMP Need
Forestry BMPs					
Forest Harvesting Practices	Forest	208,907	0	7,369	7,369
Agricultural BMPs					
Buffers Forested	Hay	2,930	0	220	220
Nutrient Management Plan Implementation	Hay	2,930	69	2,016	1,947
Retirement Highly Erodible Land	Hay	2,930	0	0	0
Soil Conservation Water Quality Plans	Hay	2,930	344	2,016	1,672
Tree Planting	Hay	2,930	0	439	439

Input Deck, James River

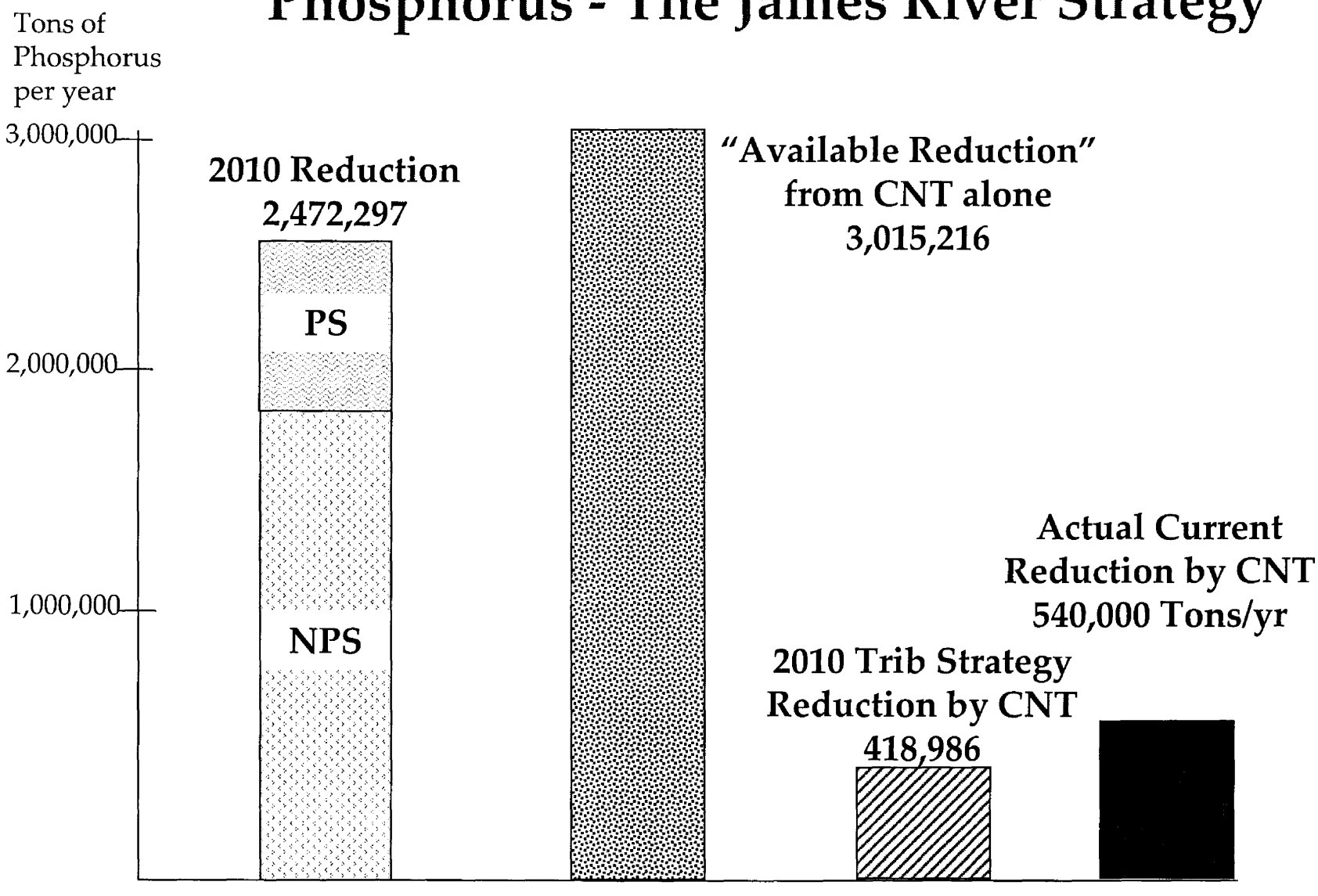
Ag BMP	Available Units Acres	Available Reduction Tons/Yr	2002 BMP Progress	2010 BMP Goal Acres	2010 BMP Red. Goal Tons/Yr
Continuous No Till	167,512	1,005,072	0	23,277	139,622

Buffers Forested	Pasture	4,899	0	481	481
Grazing Land Protection	Pasture	4,899	65	367	302
Soil Conservation Water Quality Plans	Pasture	4,899	1,336	3,488	2,152
Stream Protection with Fencing	Pasture	4,899	0	1,637	1,637
Stream Protection without Fencing	Pasture	4,899	0	1,101	1,101
Stream Stabilization/Restoration (linear feet)	Pasture	na	0	1,500	1,500
Tree Planting	Pasture	4,899	0	734	734
Urban BMPs					
Buffers Forested	Pervious Urban	156,771	0	6,351	6,351
Erosion Sediment Control	Impervious Urban	123,708	0	24,743	24,743
Erosion Sediment Control	Pervious Urban	156,771	0	23,818	23,818
Nutrient Management Plan Implementation	Pervious Urban	156,771	5,317	45,248	39,931
Non Structural Shoreline Erosion Control (linear feet)	Pervious Urban	na	0	56,000	56,000
Stream Restoration (linear feet)	Impervious Urban	na	0	23,500	23,500
Stream Restoration (linear feet)	Pervious Urban	na	0	26,000	26,000
Structural Shoreline Erosion Control (linear feet)	Pervious Urban	na	0	5,600	5,600
Storm Water Management - Filtering Practices	Impervious Urban	123,708	0	17,548	17,548
Storm Water Management - Filtering Practices	Pervious Urban	156,771	0	22,442	22,442
Storm Water Management - Infiltration Practices	Impervious Urban	123,708	0	17,548	17,548
Storm Water Management - Infiltration Practices	Pervious Urban	156,771	0	22,442	22,442
Storm Water Management - Wet Ponds/Wetlands	Pervious Urban	156,771	0	22,442	22,442

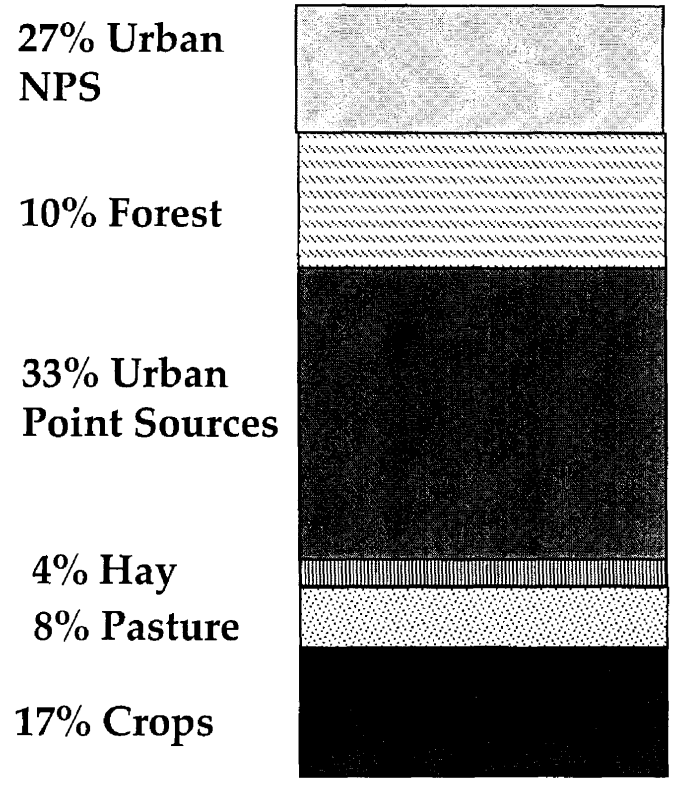
Sediment - The James River Strategy



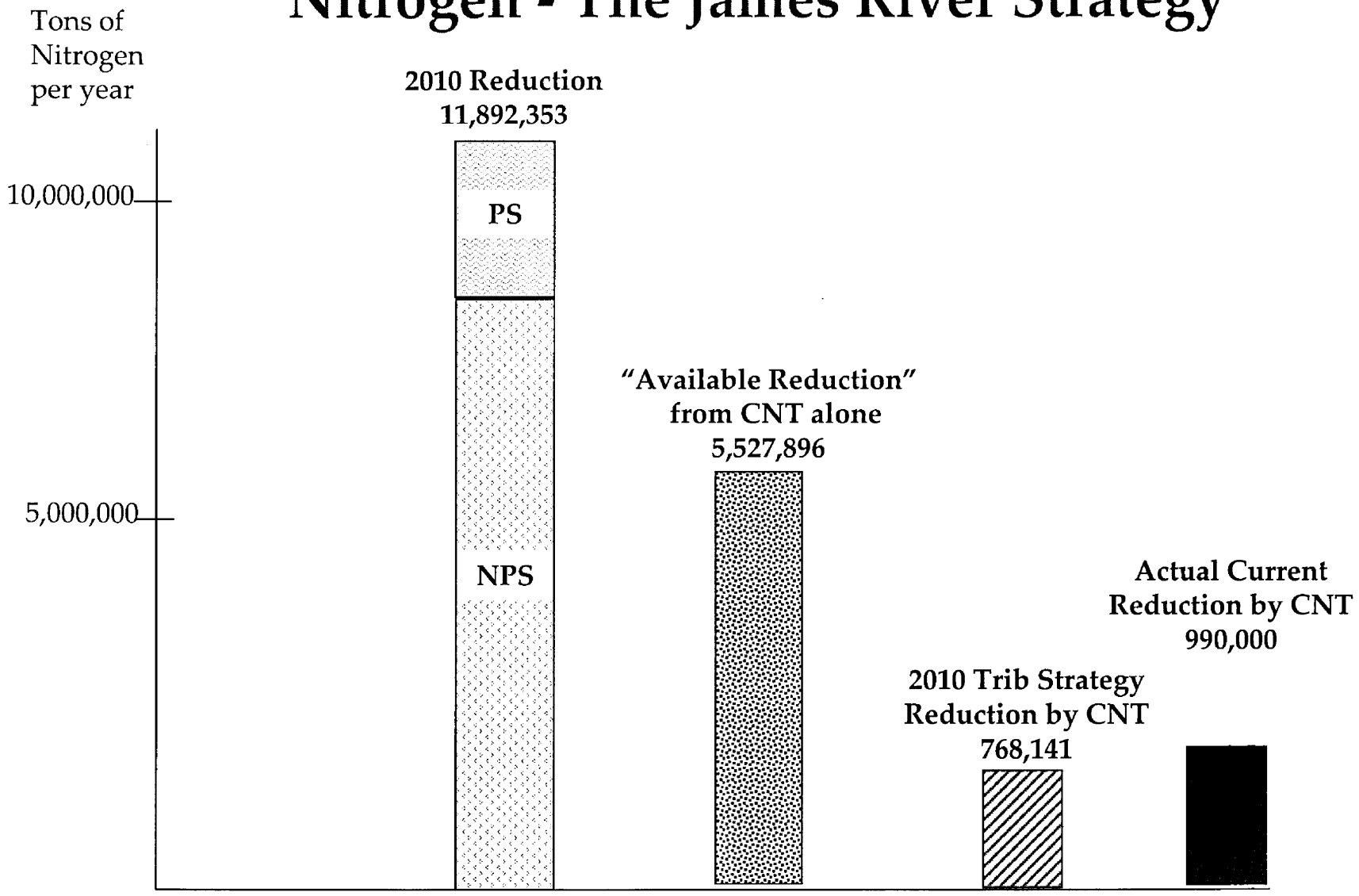
Phosphorus - The James River Strategy



Sources of Nitrogen into the Bay



Nitrogen - The James River Strategy

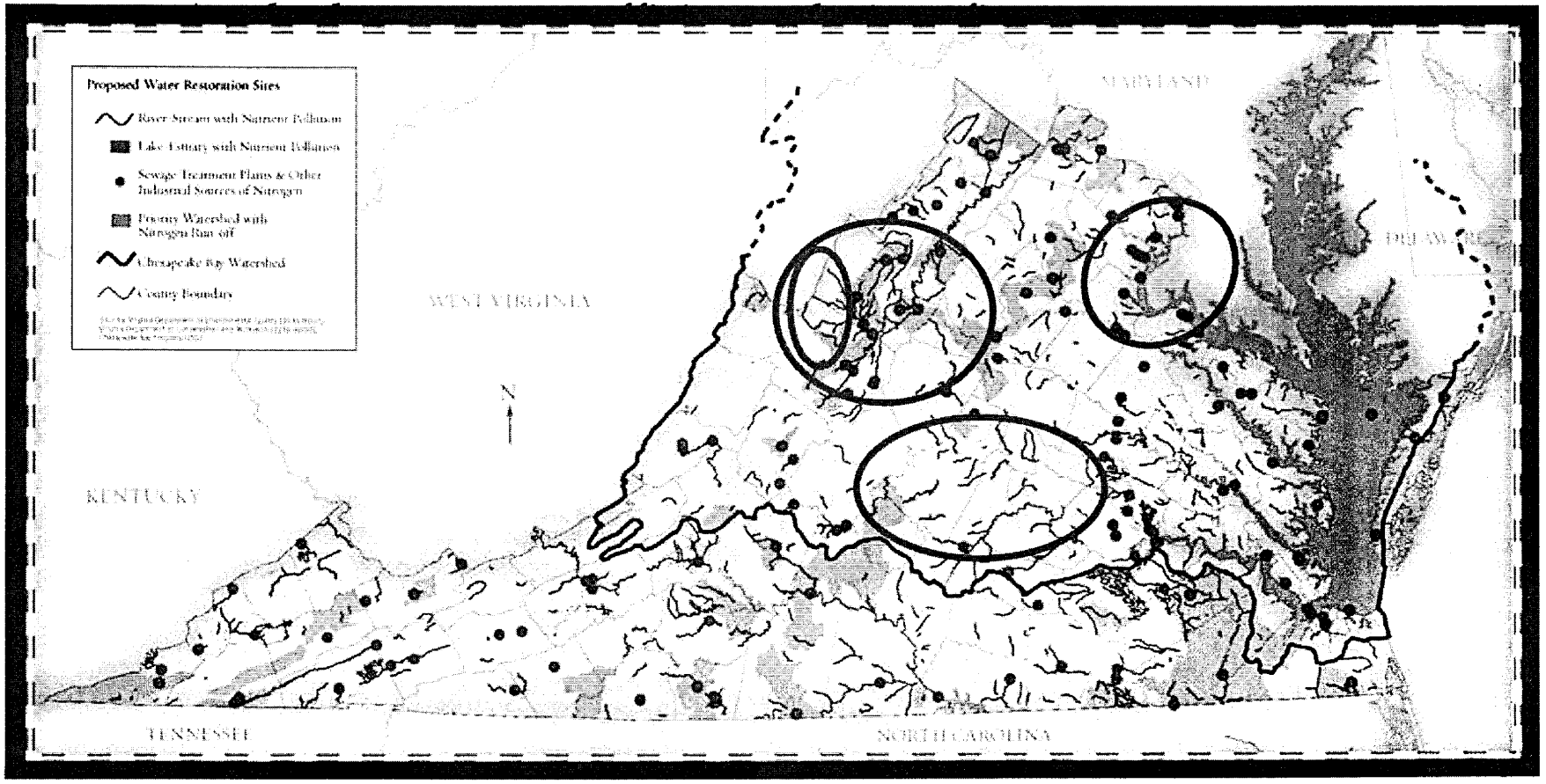


Economic Incentives for Nitrogen Reduction

	Total Cost $Millions 2003 – 2010	Nitrogen ($/lb)	Max Achievable Reduction (% of Goal)	Economic Incentives to User
Adv. Waste Water Treat	$ 1,200	$ 8.40	34.5 %	Fines & Penalties
Waste Water Land Appl.	145	4.20	5.0 %	Lower cost
Continuous No-Till	55	0.32 to 1.51	60 %	Higher yield Lower cost Less labor
Litter Treatment	N/A	NA	Used as fertilizer	Higher yield Lower costs Less labor
Ban on Lawn Fertilizers	0	0	23.8 %	Fines & Penalties

Recommendations

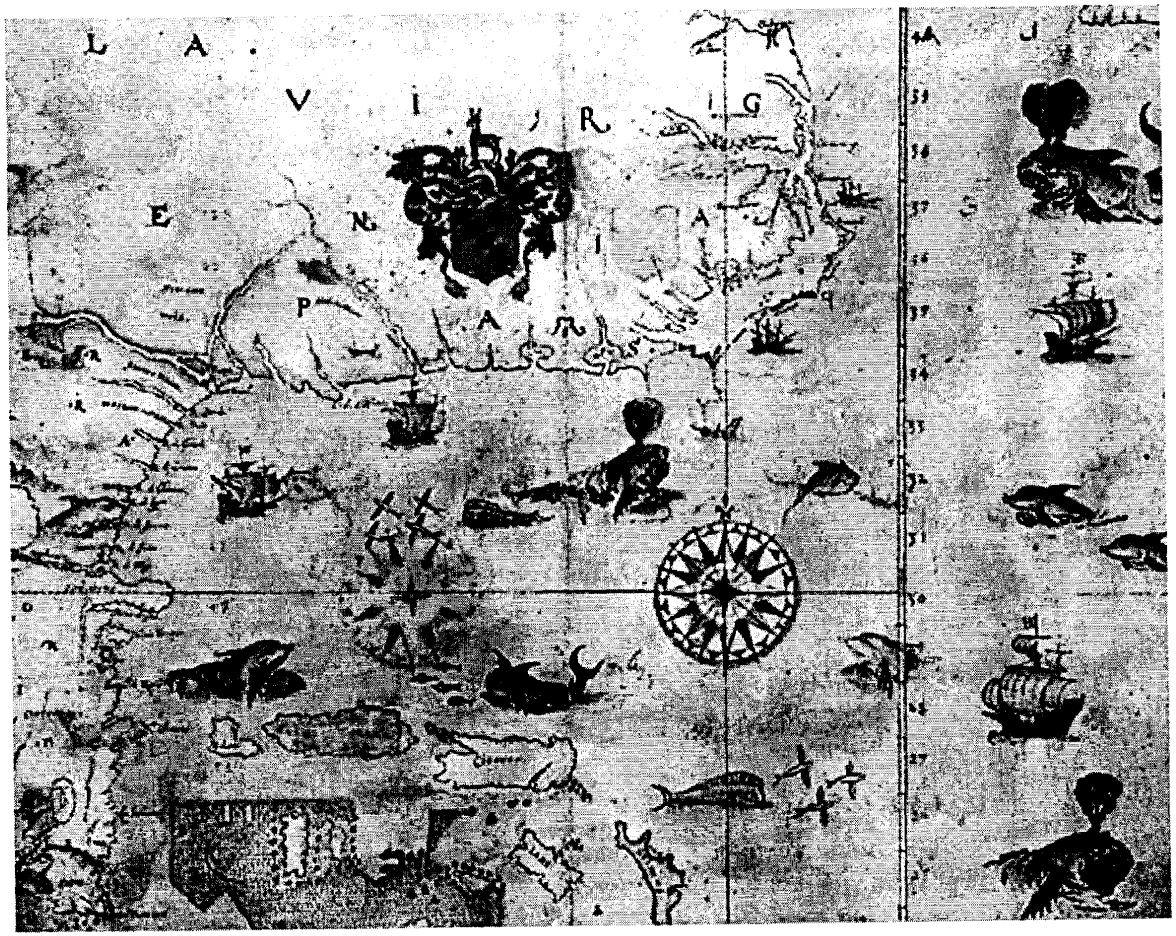
- When without the data needed to make a fully informed decision, take up the problem in discrete steps. In this case –
  - Address the worst impaired waters first;



Recommendations

- **Promote**, rather than inhibit free markets and the incentives and innovations **free markets** produce.

- Make public investment decisions like we would any public investment, within our ability to pay over the long term and in balance with other public needs



September 29, 2005

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POLICY ALTERNATIVES FOR CLEAN UP OF VIRGINIA WATERS

An Analysis Prepared for Consideration by the Joint Subcommittee to Study Options to Provide a Long-Term Funding Source to Clean Up Virginia's Polluted Waters, Including the Chesapeake Bay and its Tributaries

Prepared by
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October 29, 2005

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ABSTRACT

It is a given that before determining how to pay for a project, one needs answers to the questions: "What do we have to do; when do we have to do it; and, how much will it cost." Indeed, it is mandatory to know "What happens if we don't do anything?" Members of the House Joint Resolution 640 Subcommittee posed these questions at the Subcommittee's September 29, 2005, hearing. They did not receive a straightforward answer to any of the questions. This paper attempts to answer them, reviews the state of knowledge needed to ensure cost-effective restoration of State waters (including the Chesapeake Bay) and proposes a phased approach that would target known sources of nutrients first while also relying first on the most cost-effective nutrient reduction measures. The proposal would allow Virginia to rapidly meet its Phosphorous and Sediment goals, and do no less Nitrogen reduction than those other proposals, and at a cost about one-third the current proposals.

Contents

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INTRODUCTION

It is a given that before determining how to pay for a project[1], one needs answers to the questions: "What do we have to do; when do we have to do it; and, how much will it cost." These were the questions posed by Delegate Cox at the September 29, 2005, meeting of the Subcommittee. To date, the Subcommittee received a single answer – one proposing the most expensive means available to reduce nutrients entering the Chesapeake Bay from point sources.[2] As discussed below, DNR's proposal focuses exclusively on restoration of the Chesapeake Bay, thereby disregarding 40 percent of the Commonwealth's impaired waters – those which lie outside the Chesapeake Bay watershed and which the Subcommittee must also address. Nor does the DNR proposal reflect the practicality of alternatives to advanced chemical nutrient reduction treatment – alternatives that could reasonably reduce DNR's estimated cost of point-source treatment within the Chesapeake Bay watershed by 14% ($154 million) and speed restoration significantly. Indeed, the DNR proposal categorically rejects point source controls already successfully in place in Virginia and which more than double nutrient reduction, compared with the pollution controls DNR assumes. The DNR answer implies policy choices the Subcommittee need not and should not adopt.

This paper offers the Subcommittee an analysis of the alternative policies available to the Commonwealth under existing law and regulation. It begins with a summary of the law that authoritatively answers Chairman Vince Callahan's opening question at the September 29th meeting: "What happens if we don't do anything?" It then discusses the actions DNR must take prior to being able to rank restoration priorities (DNR admits it does not know the pollution sources for 54 percent of Virginia's impaired waters), followed by an analysis of options on

[1] House Joint Resolution 640 instructs the subcommittee to conduct a study and to: "determine the most effective means to provide a long-term funding source that will sufficiently and predictably generate the necessary revenue from sectors, including, but not limited to, state, federal, local and private sources, to fund the pollution reduction measures necessary to restore polluted waters identified on the Clean Water Act's "dirty waters" list. Specific attention shall be given to the Commonwealth's commitment and legal obligation to restore the polluted waters of the Chesapeake Bay and it tidal tributaries. House Joint Resolution No. 640, *see*: http://leg1.state.va.us/cgi-bin/legp504.exe?051+ful+HJ640ER (*Emphasis* added).

[2] *See*: "Estimated Needs: Water Quality Improvement Fund Quality 07-08 Biennium," Russ Baxter, Assistant Secretary of Natural Resources http://dls.state.va.us/groups/statewaters/meetings/092905/Baxter.pdf .

ranking restoration priorities (where possible), the relative cost and cost-effectiveness of restoration alternatives, and schedules for implementation of alternative strategies. The paper concludes with a recommendation on funding, linking the implementation options with the funding sources previously discussed by the Subcommittee Staff[3] and endorses the core of the proposals made by Delegate Lingamfelter[4].

I. WHAT IF WE DON'T DO ANYTHING?

Media reports on the Chesapeake Bay have accepted as an article of faith that Virginia is under a court order to limit discharge of nutrients into the waters of the Bay by 2010, and if Virginia does not, it will not only be in contempt of court, but could face loss of federal highway funds. This is completely false.

Restoration of the Chesapeake Bay rests on nothing more than a voluntary commitment amongst the states whose rivers discharge into the Bay.[5] Virginia suffers no legal consequences if it does not perform under that agreement and, indeed, none of the signatories to the agreement met their initial promises and have repeatedly chosen to extend deadlines and amend the agreement, rather than fund restoration from state revenues.

Under the Clean Water Act ("CWA" or "the Act"), Virginia shares responsibilities with the Federal government, and in particular, the Environmental Protection Agency (Region III).[6] Under the Act, Virginia municipalities must apply "best practicable control technology" ("BPT") to remove "conventional" pollutants, which included nutrients.[7] This is the "secondary treatment" requirement that all Virginia municipalities have now met. The Act does not require municipalities to go beyond secondary treatment. In fact, EPA refused to redefine BPT to require greater nutrient removal, in part as the Act does not authorize such an extension.[8]

The Act also requires states to assess the quality of their waters, establish water quality goals, and if not met, to establish total maximum daily loads from point source and non-point source polluters. If Virginia refused to undertake such planning, the Act mandates that EPA conduct this planning. If Virginia did not do this work, the only risk it would face is loss of the state grant that partially pays for state costs of implementing the Act.

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[3] "Additional Funding Considerations" *See*: http://dls.state.va.us/groups/statewaters/meetings/092905/AdditionalFundingConsiderations.pdf.

[4] Virginia Chesapeake Bay Clean-up Authority proposal. *See*: http://dls.state.va.us/groups/statewaters/meetings/092905/CleaningUpTheBay.pdf

[5] A full discussion of the voluntary agreements is presented in: U.S. EPA, Decision On Petition For Rulemaking To Address Nutrient Pollution From Significant Point Sources In The Chesapeake Bay Watershed, (June 13, 2005) *See*: http://www.epa.gov/water/cbfpetition/petition.pdf (page 6, et seq.)

[6] Congressional Research Service, "Clean Water Act: A Summary of the Law" (Jan 4, 2002), *See*: http://www.epa.gov/water/cbfpetition/petition.pdf.

[7] *Id*, at page CRS-4.

[8] : U.S. EPA, Decision On Petition For Rulemaking To Address Nutrient Pollution From Significant Point Sources In The Chesapeake Bay Watershed, (June 13, 2005), *see* http://www.epa.gov/water/cbfpetition/petition.pdf.

The commonly referenced "court order" also requires water quality assessment and the subsequent required actions – in essence, a court ordered implementation of the Act. The court order, however, is an order against EPA. EPA and Virginia made an agreement for Virginia to carry out the planning effort by 2010, in an attempt by EPA to avoid a court order. The court did not buy the approach, required more than the original agreement, and made the requirements of the order enforceable against EPA alone. As Virginia was not a party to the suit, the court could not and did not make the state responsible for carrying out the planning activities. This, however, is moot as the Commonwealth has fully performed under these agreements. If Virginia does not complete its planning by 2010, then EPA must do so by 2011, or be in contempt of court. The agreement, incorporated into the court order, has several intermediate deadlines – all enforceable against EPA, but not Virginia. Nothing in the order or the Act requires a municipality or non-point source to turn over a single spade-full of dirt. The entire gravity of the action is to ensure Virginia has water quality standards, even if unenforceable.

The only forcing requirement under the water quality planning authorities of the Act is one that requires point sources to meet discharge limitations that Virginia concludes are necessary to achieve the water quality goals. Taking the BPT and water quality planning sections of the Act together, however, a permit requiring more than secondary treatment for nutrient removal is not federally enforceable under the authorities of the Act.[9]

Virginia, however, has the authority to require more than secondary treatment, and it is in the process of doing so at this time. Virginia's authority rises from state law, not federal law.[10] Under these proposed regulations, the Department of Environmental Quality will impose nutrient restrictions that will force municipalities to go beyond best practicable control technology (secondary treatment) and apply tertiary nutrient removal. Notably, it remains unclear whether EPA could bring an enforcement case against a Virginia municipality under Virginia laws and regulations. In general, the EPA has defined state laws as federally enforceable, and might take an action exclusively under the State authorities, but this would be an extremely rare event. The Department of Justice, who files such cases, would generally not accept a case exclusively under State law, especially if the State has initiated administrative or civil actions of their own.

In conclusion, Virginia is free to regulate and enforce its laws as it chooses. Under the Clean Water Act, state regulatory agencies generally attempt to harmonize regulatory enforcement with funding opportunities, a practice Virginia has followed.

Thus, in response to the question, "What if we don't do anything?", the answer is that Virginia is master of its own destiny and the Virginia legislature must decide what it can afford. The amount Virginia spends, the cost-effectiveness of its spending and the speed with which it spends – all control the amount and speed of Bay restoration. As discussed in the next section, this can significantly harm the economic viability of Virginia watermen, especially those who ply their trade in Virginia waters and coves.

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[9] This has never been tested at law, but is the common interpretation by EPA's Office of General Counsel and Water Enforcement Division attorneys. Personal communications to the author. The Agency has chosen not to address this matter in writing, choosing instead to resolve matters through voluntary agreements under the Chesapeake Bay Agreement, and similar agreements in other major watershed.

[10] 9VAC25-31-50. *See*: http://leg1.state.va.us/cgi-bin/legp504.exe?000+reg+9VAC25-31-50 .

II. WHAT DO WE KNOW AND WHAT HAVE WE ASSUMED?

DNR has done an outstanding job of assembling information about Virginia's waters. Based on data made available by DNR and its component units, the Appendix to this report provides a spreadsheet identifying each of the municipal point sources in Virginia, with information about their size, their location, the impairment status of the waters into which they discharge and the cost of alternative nutrient reduction and funding measures associated with each. The table also contains embedded links to the permit conditions on each facility, basic information on the facility (including compliance with current regulations), and fact sheets on the impaired water immediately downstream from each facility.

Information, alone, unfortunately, does not directly assist the Subcommittee. The Subcommittee needs the information presented in a manner that helps the Subcommittee understand its options. DNR's analysis of needed financing fails in this regard as it treats the Chesapeake Bay as a simple sink into which all rivers run and evaluates funding needs as though the goal is having reduced nutrients and sediments in the sink – treating the sink as a well mixed vessel with uniform water quality. That is not the case.

Virginia's waters flow within nine basic river basins, six of which fall within the Chesapeake Bay watershed. About 65 percent of the stream reaches fall within the Chesapeake Bay Watershed, and 38% (1,117) of those are impaired (25% of all reaches in the state). Outside the Chesapeake Bay watershed, 28% (463) reaches are impaired (10% of all reaches in the state). Not all impairments are equal, however.

Table 1 – Impaired Virginia Streams

	Stream Classifications						
	Does or will soon support uses or of Unknown Quality	Known Impaired Reaches (by impairment class)					
River Basin		4A	5A	5B	5C	5D	Total Impaired
Chesapeake Bay Watershed	**1843**	**52**	**670**	**285**	**60**	**50**	**1117**
Ches. Bay Coast	148	0	80	106	4	0	190
Potomac	484	39	214	33	13	13	312
James	826	8	229	7	24		268
Rappahannock	148	5	75	37	19	0	136
York	136	0	72	17	0	0	89
Chowan/Dismal Swamp	101	0	0	85	0	37	122
Non-Chesapeake Basins	**1169**	**78**	**363**	**0**	**8**	**14**	**463**
New	334	10	82	0	2	1	95
Tennessee/Big Sandy	384	21	111	0	0	1	133
Roanoke/Yadkin	451	47	170	0	6	12	235
Total	**3012**	**130**	**1033**	**285**	**68**	**64**	**1580**

Source: Final 2004 305(b)/303(d) Water Quality Assessment Integrated Report
http://www.deq.virginia.gov/wqa/ir2004.html

Impairment Classes.

FULLY SUPPORTING – Waters are supporting one or more designated uses
- EPA Category 1: Attaining all associated designated uses and no designated use is threatened.
- EPA Category 2: Some of the designated uses are met but there is insufficient data to determine if remaining designated uses are met.
  - Va. Category 2A - waters are attaining all of the uses for which they are monitored and there is insufficient data to document the attainment of all uses.
  - Va. Category 2B – waters are of concern to the state but no Water Quality Standard exists for a specific pollutant, or the water exceeds a state screening value. These waters are considered fully supporting with observed effects.

INDETERMINATE – Waters needing additional information
- EPA Category 3: Insufficient data to determine whether any designated uses are met
  - Va. Category 3A - no data are available within the data window of the current assessment to determine if any designated use is attained and the water was not previously listed as impaired.
  - Va. Category 3B - some data exists but is insufficient to determine attainment of designated uses. Such waters will be a prioritized for follow up monitoring.
  - Va. Category 3C- data collected by a citizen monitoring or other organization indicating water quality problems may exist but the methodology and/or data quality has not been approved for a determination of attainment of designated uses. These waters are considered as having insufficient data with observed effects. Such waters will be a prioritized for follow up monitoring.
  - Va. Category 3D – data collected by a citizen monitoring or other organization indicate that designated uses are attained however the methodology and/or data quality has not been approved for such a determination.

IMPAIRED – Waters are impaired or threatened but a TMDL is not needed.
- EPA Category 4A: impaired or threatened for one or more designated uses but does not require a TMDL because the TMDL for specific pollutant(s) is complete and US EPA approved.
- EPA Category 4B: impaired or threatened for one or more designated uses but does not require the development of a TMDL because other pollution control requirements (such as VPDES limits under a compliance schedule) are reasonably expected to result in attainment of the Water Quality Standard by the next reporting period or permit cycle.
- EPA Category 4C: impaired or threatened for one or more designated uses but does not require a TMDL because the impairment is not caused by a pollutant and/or is determined to be caused by natural conditions.

IMPAIRED – requiring a TMDL
- EPA Category 5: Waters are impaired or threatened and a TMDL is needed.
  - Va. Category 5A - the Water Quality Standard is not attained. The AU is impaired for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).
  - Va. Category 5B –the Water Quality Standard for shellfish use is not attained. One or more pollutants remain requiring TMDL development.
  - Va. Category 5C – the Water Quality Standard is not attained due to suspected natural conditions. The AU is impaired for one or more designated uses by a pollutant(s) and may require a TMDL (303d list). Standards for these waters may be re-evaluated due to the effects of natural conditions.
  - Va. Category 5D - the Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants remain requiring TMDL development.
  - Va. Category 5E – effluent limited waters are not expected to meet compliance schedules by next permit cycle or reporting period.

Impairments caused by nutrients and sediments generally fall within Category 5 impaired waters and the impairments are to benthic populations and dissolved oxygen quality. The benthos is the population of organisms living on the bottom of streams and other waters. These provide food for fish, crustaceans and mollusks. Fish, crustaceans and mollusks need oxygen to survive – oxygen dissolved into the water. If benthic and dissolved oxygen quality are impaired, then fish, crustaceans and mollusks cannot survive in those waters. These are the impairments of concern in the Chesapeake Bay and the basis for efforts to control nutrient and sediment

loadings, as sediments cover and thus kill the benthos organisms (and mollusks), while nutrients cause algae to consume dissolved oxygen, leaving too little for fish, crustaceans and mollusks .

Table 2 identifies the distribution of impairments in each of Virginia's major river basins that directly affect the health of fish, crustaceans and mollusks. Most notably, despite diligent, competent and extensive investigation by Virginia staff and citizens, the source of impairments remains unknown for 55 percent of these waters. In the specific case of Benthic and Dissolved Oxygen impaired waters, the source of the problem is unknown 43 percent of the time. Subtracting natural sources, the known target for nutrient reduction has been identified in only 34 percent of benthic and dissolved oxygen impaired waters. Of these, only 17 waters are impaired by point sources, not all of which are municipal waste water treatment facilities.

Looking exclusively at the Chesapeake Bay watershed, only 10 reaches have been identified as impaired by point sources. The Appendix identifies the six municipal facilities that impair river basins within the Chesapeake Bay watershed. As discussed below, these six plants would require a total of not quite $50 million to install nutrient reduction measures as necessary to address all known point sources of nutrient-related impairments to Virginia waters within the Chesapeake Bay watershed. This is considerably less than the $1.11 billion DNR claims is needed to control nutrients from point sources, and reflects the massive distortion of the assumption that the Chesapeake Bay is a simple sink requiring nutrient controls on all municipal facilities.

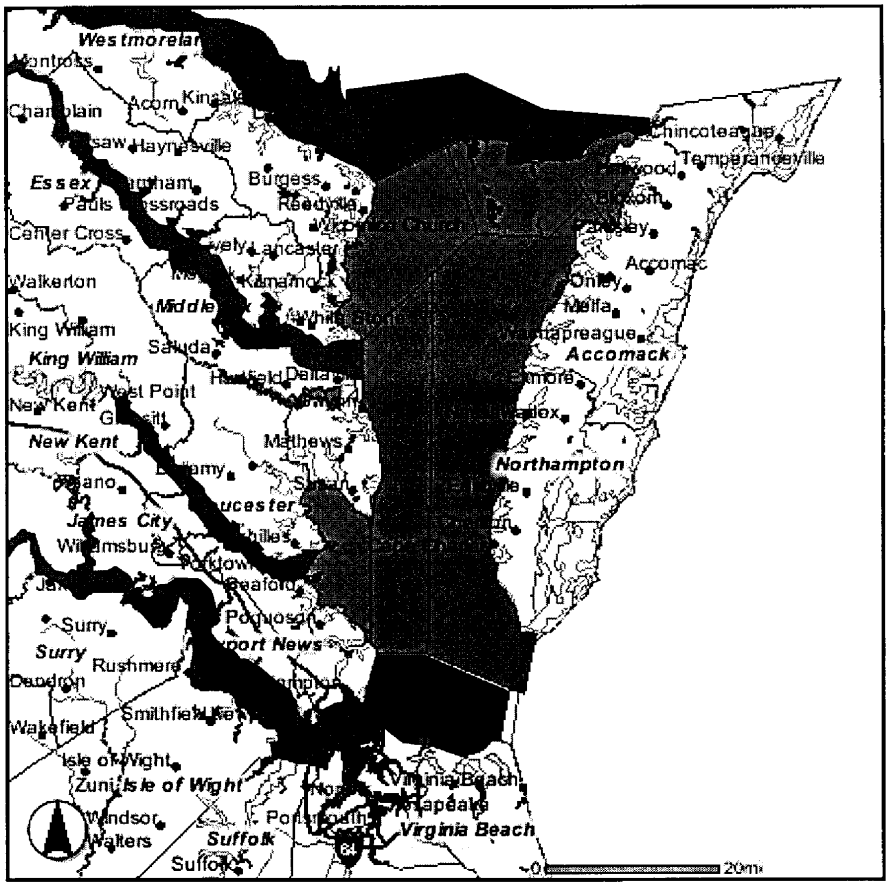
Table 2 –Impairments of Virginia Streams

River Basin	Category 5 Impaired Waters						
	Fecal & Bacterial			Benthic & DO			
	Point Source	Non-Point Source	Unknown Source	Natural Source	Point Source	Non-Point Source	Unknown Source
Chesapeake Bay Watershed	**7**	**93**	**277**	**61**	**10**	**42**	**123**
Ches. Bay Coast	0	0	39	4	1	3	32
Potomac	0	56	43	5	2	16	27
James	6	36	87	10	6	11	35
Rappahannock	0	0	50	3	0	0	3
York	0	0	8	3	1	12	13
Chowan/Dismal Swamp	1	1	50	36	0	0	13
Non-Chesapeake Basins	**4**	**118**	**82**	**15**	**7**	**54**	**22**
New	0	40	22	2	0	11	1
Tennessee/Big Sandy	3	21	27	4	1	33	18
Roanoke/Yadkin	1	57	33	9	6	10	3
Total	**11**	**211**	**359**	**76**	**17**	**96**	**145**

Source: Final 2004 305(b)/303(d) Water Qualitiy Assessment Integrated Report, Chapter 3.3.
See: http://www.deq.virginia.gov/wqa/pdf/2004ir/irch33ay04.pdf

It is important to note that DNR's costing assumption of the Bay as a simple sink is not only inconsistent with its own data, but with its assessments of the impairments on the Bay itself. As shown in Figure 1, the Virginia portion of the bay consists of 8 segments. The two into which the Potomac and the James basins flow are not considered impaired by Virginia waters, although the portion of the Bay receiving Potomac waters is considered a Maryland impaired water. The most southern portion of the Bay is simply not impaired. Of the remaining, the source of impairments in the two north-eastern segments are listed as "unknown".[11] The other four are impaired by "Nonpoint Sources, Point Sources and Sources Outside State Jurisdiction".[12] In other words, we don't know the actual sources, other than it had to come from somewhere in Virginia, Maryland, the District of Columbia or points further north and west.

Figure 1 –Segments of the Chesapeake Bay Impaired, in part, by Virginia



[11] *See*: http://gisweb.deq.virginia.gov/deqims/factsheet2004.cfm?tmdlid=VACB-C10E-POC and http://gisweb.deq.virginia.gov/deqims/factsheet2004.cfm?tmdlid=VACB-C10E-TAN

[12] *See*: http://gisweb.deq.virginia.gov/deqims/factsheet2004.cfm?tmdlid=VACB-R01E-CB6, http://gisweb.deq.virginia.gov/deqims/factsheet2004.cfm?tmdlid=VACB-R01E-CB7, http://gisweb.deq.virginia.gov/deqims/factsheet2004.cfm?tmdlid=VACB-R01E-MOB and http://gisweb.deq.virginia.gov/deqims/factsheet2004.cfm?tmdlid=VACB-R01E-CB5.

Because DNR does not know the actual sources of impairments to water quality in the Chesapeake Bay, it has had to make a hard choice. They chose to focus on municipal point sources because they can use permits and grants to control nutrient emissions from these sources, and if they force nutrient reduction at every plant, they will have ensured reductions at the plants that actually cause the problems, although they will never know which were the real problem.

In so doing, DNR discounts the larger and more important known source of nutrients into Virginia waters and the Bay – agricultural croplands. In so doing, it misses the opportunity for potentially massive and extremely cost-effective nutrient reductions available from broad application of best agricultural management practices.[13] As discussed in a previous submission to the Subcommittee and shown in Table 3, Ag BMPs, alone, may be able to reduce the Phosphorus loadings to the rivers and the Bay enough to meet the Chesapeake Bay Agreement goals for Virginia. No one can say whether this is sufficient to ameliorate the dissolved oxygen problems, but as algae need both phosphorus and nitrogen, the DNR approach misses the opportunity to use a significantly lower cost approach that may solve the dissolved oxygen problem in parts of the Bay and many of the impaired rivers. As for benthics, this is mostly a sediment problems, one for which point source controls offer no relief whatever.

Table 3

Percent of Virginia nutrient pollution eliminated by point sources funding plans and by conservation crop tilling practices

	TN	P	Sediment
Water Quality Goal	***34 %***	***39 %***	***21 %***
Maximum Point Source Reductions:			
o under the "Dollar a Week" plan	10 %	7 %	none
o under the $50 Million/yr plan	6 %	4 %	none
Continuous No-Till Crop Management Reductions:			
o **1 million acres**	**11 %**	**34.8%**	**66.3 %**
o 500,000 acres	5.5%	17.6%	33.1 %

DNR adopted is approach because it lacked information needed to pinpoint restoration efforts. When the source of impairments is unknown for about half the impaired rivers and streams and is completely unknown for the Bay itself, one alternative is to wait for better information before making large investments. A better approach is to use the information available to target known problems and implement step-wise, cost-efficient pollution controls that allow assessment of improvements over time, leaving the decision to make higher cost investments to a point in time when it becomes clear what is needed. The next section offers one such incremental approach.

[13] DNR does not ignore these potential reductions, but its watershed management plans deeply underestimate the amount of reductions available and their funding proposals reflect no more than a minor commitment to this massive opportunity. *See*: Schnare, "Options for Clean Up of State Waters", September 29, 2005, http://dls.state.va.us/groups/statewaters/meetings/092905/CleanUpOptions.pdf.

III. WHAT DO WE HAVE TO DO AND WHEN DO WE HAVE TO DO IT

Currently available information allows targeting of immediate investment opportunities. Those opportunities include point and non-point sources and should require integration of point-nonpoint source solutions, where they are cost effective. A second step would target impaired waters where sources may be unknown, but which likely reflect low-cost opportunities with high potential payoffs. A third step would come after assessment of the effectiveness of the first two phases. Unlike the basic DNR costing proposal, this approach would address all nine river basins and the Chesapeake Bay.

A. Phase I – Known Sources

Point Sources: Nine municipal facilities are known to cause nutrient-based impairments to Virginia waters, only 2 of which contribute to impaired sections of the Chesapeake Bay. Of these 9, the first four shown in Table 4 are specifically targeted for state funds. Three of the four do not contribute to impairments in the Bay. The total amount DNR would grant and loan these facilities is shown in the column entitled "Advanced Chemical Treatment Cost".

Table 4

On list of 46	Facility	River Basin	Nutrient Impairment From Point Source	Nutrient Impairment from NPS	Advanced Chemical Treatment Cost	Irrigation/CNT Cost
POINT SOURCE NUTRIENT IMPAIRMENT						
Chesapeake Bay Watershed Basin						
X	Covington	James	✓	✓ (Ag & Urban)	$6,300,000	Geo-Infeasible
X	Richmond (DWF only)	James	✓		$32,100,000	Geo-Infeasible
X	Clifton Forge	James	✓		$5,200,000	$2,650,000
X	Onancock	Chesapeake Bay	✓		$3,700,000	$1,900,000
	Alleghany Co - Lower Jackson RIVER WWTP	James	✓	✓ (Ag & Urban)	$5,854,106	$2,977,053
	Massanutten STP	Potomac	✓		$5,854,106	$2,977,053
Non-Chesapeake Bay Watershed Basins						
	Christiansburg Town	New	✓	✓ (Ag & Urban)	$8,284,455	$4,192,228
	South Hill WWTP	Roanoke/ Yadkin	✓		$5,854,106	$2,977,053
	Henry Co PSA	Dan	✓	✓ (Ag & Urban)	$8,284,455	$4,192,228
				TOTAL	$81,431,230	$21,865,615

If, however, seven of these nine plants used spray-irrigation in place of advanced chemical treatment, and the irrigated fields applied continuous no-till crop management, rather than a nutrient reduction to the river basin of 40% (of nutrients in the waste water from these facilities), their nutrient reduction to the river would be 180% of nutrients in their waste water, due to a 90% reduction of nutrients due to spray irrigation and continuous no-till and the elimination of chemical nutrients typically applied to the crops. The savings would also be large. In place of a $47.3 million cost for the four DNR targeted facilities, a known-source, cost-efficient approach would produce significantly more nutrient reduction for only $21.9 million,

less than half the cost. The total Phase I point source costs for the Chesapeake Bay basin would be $49 million for six plants versus $43 million for the four DNR List of 46 plants.

Non-Point Sources: As discussed above, the source of benthic and dissolved oxygen impairment in 96 waters result from non-point sources, the vast majority of which are rural. Considering the activities found on the 145 waters where the source of the benthic and dissolved oxygen impairment is unknown, most of these are likely agricultural NPS sources as well. These approximately 230 rural waters account for nearly 90 percent of Virginia waters with benthic and dissolved oxygen impairments.

About 60 percent of agricultural NPS nutrient discharges come from croplands, a number which includes 80% of manure wastes. The remainder of NPS nutrient loadings come from hay crops, pasture and manure storage.[14] There are approximately 1,000 small grain and corn crop farmers in Virginia. As has been previously presented to the Subcommittee, the total cost for WQIF incentives that spur use of continuous no-till crop management, and related other agricultural best management practices that reduce nutrient loadings to Virginia waters, is approximately $50,000 per farm, or $50 million statewide (plus $5 million for essential new technology-transfer Soil and Water District staff).[15]

By weight, about 40% of sediment discharges into Virginia waters come off crop lands, the remainder from hay fields and pasture land.[16] As shown in table 4, use of continuous no-till on crop lands would produce three times Virginia's sediment reduction goal for the Bay. This non-point sediment discharge is the single biggest threat to benthic health in Virginia's waters and accounts for nearly all rural stream benthic impairments. Continuous no-till crop management, combined with cover crops and other related agricultural BMPs used to increase the carbon base in fields (collectively: "CNT"), prevents over 95% of sediment runoff. Thus, agricultural nutrient controls from CNT also produce the sediment reduction sought in Virginia waters and in the Bay.

The total cost of a Phase I (program) that addresses known sources of benthic and dissolved oxygen in all Virginia river basins would sum to about $117 million, $41 million of which would be in loans under the state revolving fund. It would take about 3 years to implement this phase, considering the management challenges discussed in the final section of this paper.

B. The James River as a Phase I example

The James River basin contains about 1,094 identifiable "waters" (sections of the James or sections of tributaries to the James). Of these, 268 are listed as impaired and 62 of those have benthic or dissolved oxygen impairments. The basin contains four municipal facilities that are

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[14] The EPA Chesapeake Bay Program generates estimates of sources of nutrients into the bay. These figures were drawn from estimates provided by EPA in the spring of 2005. EPA Contact gshenk@chesapeakebay.net

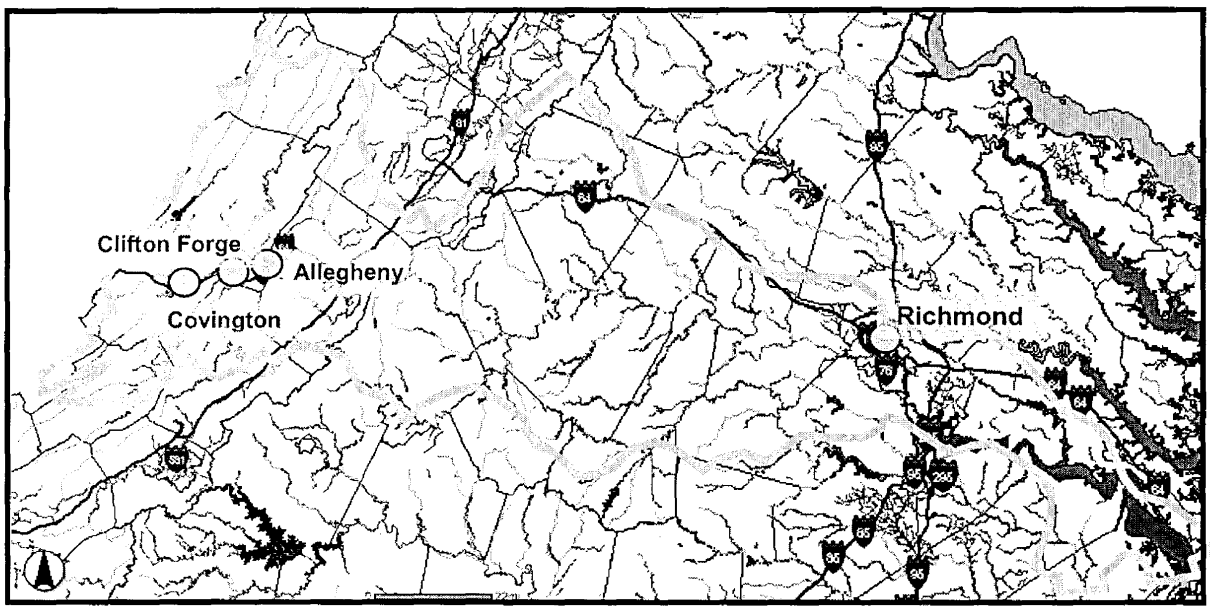
[15] *See*: Schnare, "Options for Clean Up of State Waters", September 29, 2005, http://dls.state.va.us/groups/statewaters/meetings/092905/CleanUpOptions.pdf.

[16] *Op cite.* (note 14).

the source of benthic or dissolved oxygen impairments, only three of which are on the DNR list of 46. Figure 2 shows the location of these facilities and the impaired waters (all causes).

As discussed above, the James River Basin makes no contribution to impaired sections of the Chesapeake Bay. Notably, 9 large municipal facilities (greater than 20 MGD) discharge directly to the lower James, but do not cause nutrient impairments in the Chesapeake Bay. The River Estuary (the mouth of the river), however, is impaired and of considerable economic interest to the State for its potential mollusk and crustacean fisheries. Although most agricultural non-point sources of nutrients and sediment in half the Lower James have already been controlled by use of CNT practices, the estuary benthic environment is still not in sufficiently good health to allow for a return to the historic production of oysters, clams and other near-shore marine catch. This appears to be predominantly a sediment problem, rather than a nutrient problem.

Figure 2 – the James River Basin



A Phase I program for this basin would address many of the elements of the James River Tributary Strategy, but would significantly depart from certain policies. Under the current DNR strategy, "all wastewater treatment plants [must] have some minimum role in the nutrient reduction efforts within the Virginia Bay watershed," and that involvement would not be dependant upon the effectiveness of non-point source achievements.[17] Based on the discussion above, only four of the 19 municipal facilities are known to cause impairments and thus require immediate address. The 18 Soil and Water Districts within the basin would have the major responsibility for a Phase I program and their major duty would be to export the CNT successes

[17] "Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy for the James River, Lynnhaven and Poquoson Coastal Basins" (March 2005) at p. 49, http://www.naturalresources.virginia.gov/Initiatives/TributaryStrategies/FinalizedTribStrats/james.pdf.

in the Lower James to the Middle and Upper James segments. Joint use of spray irrigation and CNT in two of the western facilities would likely speed adoption of these inexpensive and essential agricultural best management practices. In place of a point-source driven program expected to cost $420 to $460 million, a Phase I approach would cost approximately $44 million for point sources and perhaps as much as an additional $22 million for an agricultural BMP incentives program.

C. Known Non-Sources

DNR's impaired water quality fact sheets impeach the presumption that all point sources cause benthic and dissolved oxygen impairments in Virginia waters. DNR's impaired waters fact sheets identify only nine of Virginia's 96 municipal wastewater facilities (9%) as the cause of benthic or dissolved oxygen (nutrient-related) impairments.[18] Of these nine, only 6 are within the Chesapeake Bay watershed. In contrast, DNR proposes the first grants and loans to three facilities, not one of which has been found to constitute a source of impairment of Virginia waters of any kind (fecal, benthic, dissolved oxygen, toxic chemicals or fish/shellfish restrictions). Among its list of 46 facilities to be funded in the '07-'08 biennium, 17 facilities (37%) discharge into waters that DNR has concluded do not suffer from any impairment of any kind. The price tag for DNR-proposed treatment on these 17 facilities is more than $125 million in grants and loans.

A particularly egregious targeting of a "known non-source" is DNR's inclusion of the Timberville facility in the "list of 46". This facility uses spray irrigation in place of advanced chemical treatment, achieving a more than 90 percent reduction in nutrients reaching the Shenandoah river, as compared with a 40 percent reduction available from advanced chemical treatment. This facility does not discharge into a nutrient-impaired water. DNR has placed the facility on its "list of 46", and would have the facility expend $2.5 million, apparently to replace a working installation with chemical treatment at twice the cost and with less than half the nutrient reduction. The better solution is to leave the relatively new Timberville facility in place, but have the cropland onto which the effluent is sprayed use CNT methods, thus ensuring the nutrients not used by crops remain fixed in the soil. This would also reduce sediments otherwise flowing into the river. Of course, Timberville is not the only "known non-source" on the list of 46.

Eight of the "list of 46" facilities discharge into benthic or dissolved oxygen impaired waters. Notably, DNR does not consider any of the 8 to be the source of the benthic or dissolved oxygen impairment. The cost of DNR-proposed treatment on these 8 facilities is more than $65 million in grants and loans. In seven of these 8 cases, the facilities could use spray irrigation and CNT, at a total cost of $20 million for the 7, compared with a $39.5 million price tag for advanced chemical treatment at the seven facilities. The spray irrigation/CNT approach would also quadruple nutrient reductions at these seven plants, as compared with chemical treatment, and would produce significant reductions in agricultural NPS nutrient and sediment discharges, which DNR believes are the sources of impairment to these waters. Even this $20 million may

[18] *See* the Appendix. Note, DNR has identified more than 96 municipal facilities, but EPA data bases, which depend on state data, identify only the 96 described in the Appendix.

not be cost-effective as use of CNT practices on all the cropland discharging into these eight waters may be sufficient to meet water quality goals. If it were, Virginia need expend less than a million dollars using CNT in place of $65 million for chemical treatment.

Arguably, each of the facilities on the "list of 46" contribute significant nutrient loadings to the Chesapeake Bay, even though only 4 actually impair Virginia waters. Phase II addresses when and whether to fund advanced treatment at these plants.

D. Phase II – Ensuring Cost-Efficiency and Trading Non-Point Source reductions

As discussed above, application of agricultural best management practices on all 1.1 million acres of small grain and corn cropland would cost approximately $55 million, and, in conjunction with Phase I, would result in Virginia meeting Phosphorus and sediment goals under the Chesapeake Bay agreement. The current DNR "list of 46" proposal, alone, would cost $460 million in grants and loans, and would not achieve any of the goals. Further, use of spray irrigation and CNT crop management (on the irrigated fields) at the qualified list of 46 facilities would produce two to four times the nutrient reduction at one-fourth to one-seventh the cost.

These facts support three policies: (1) grants and loans should not go to point sources without first examining the effectiveness of Phase I efforts; (2) no grant or loan should go to a facility until it has fully explored the cost-effectiveness and utility of spray irrigation (w/ CNT) in place of advanced chemical nutrient reduction; and (3) creation of a nutrient trading program that would produce nutrient reduction on agricultural lands in place of advanced chemical nutrient reduction at a point source.

Phase II need not wait for completion of Phase I activities. The second and third policies should immediately apply to any municipal facility seeking funds for nutrient reduction. Further, the improvements on water quality from any nutrient reduction technique, including CNT and related agricultural best management practices, is observable within 6 to 18 months.

Early Phase I information on the benefits of the most cost-effective techniques should fill the existing data gap in two ways. First, it will help determine the source of nutrient-related impairments where they are now unknown, allowing better targeting for grants and loans. If control of agricultural sources does not sufficiently reduce nutrients, only then would Virginia need to expend its grants and loans on higher-cost solutions – first at facilities where spray irrigation is feasible, and then, as a last resort, using the highest cost advanced chemical nutrient reduction. Second, a non-point source – point source nutrient trading program will speed the development of information needed to implement Phase II policies and will create the environment for other NPS nutrient reduction activities, including cost-effective urban and suburban NPS reductions.

E. Phase III – Use Lowest Cost Point Source Treatment at Every Municipal Facility in the Chesapeake Bay

Conceivably, Virginia will be unable to withstand the unfounded presumption that every municipal point source in the Chesapeake Bay watershed must install nutrient reduction technology. A final Phase III – "Thrown in the towel and the bathroom sink" alternative would have every facility use its least cost treatment option, without trading with non-point sources. This would involve all municipalities on the Chesapeake Bay Watershed not included in Phases I and II.

IV. "How Much Will It Cost"

Table 5 displays the estimated costs of the DNR proposal and the alternatives offered above.

Table 5 – Alternative Costs for Nutrient Reduction in the Chesapeake Bay Watershed

	FY '06		FY '07 – '08		Out Years (to 2010)		Total
Element	**Grants**	**Loans**	**Grants**	**Loans**	**Grants**	**Loans**	
DNR List of 46 (I)*	$41 M	$41 M	$302 M	$302 M	$208 M	$208 M	$1,102 M
DNR List of 46 (II)*	$40 M	$40 M	$124 - $164 M	$124 - $164 M			$ 898 M– $1,058 M
DNR PS non-46** Remainder					$285 - $325	$285 - $325	
DNR NPS (all Ag)			$90 M		$150 M		$ 240 M
						Total	$1,342 M
Phase I – (PS)			$41 M	$41 M			$ 82 M
Phase I – (NPS Ag)	$50 M		$55 M		$ 30 M		$135 M
Phase II – (Low Cost PS)			$17 M	$18 M			$ 35 M
Phase II – (Last Resort Low & High Cost PS)					$126 M	$126 M	$252 M
						Total	$ 504 M
	Total Program Costs (2006 - 2010)				**Grants**	**Loans**	**Total**
	DNR (I) & Ag				$791 M	$551 M	$1,342 M
	Phased Alternative				$319 M	$185	$ 504 M
	Phase III (Kitchen Sink Remainder)				$274	$275	$ 549 M

* DNR has provided two sets of estimates, a set of budget estimates prepared by DEQ and incorporated into the Appendix, and those presented by Deputy Secretary Baxter to the Subcommittee at the Sept. 29, 2005, hearing (*See*: http://dls.state.va.us/groups/statewaters/meetings/092905/Baxter.pdf). The Budget estimates are shown as DNR (I) and the Deputy Secretary's estimates are shown as DNR (II).

** DNR did not cost the nutrient reduction needs for the remaining 50 systems. The costs are estimated based on regression of the costs of the 46 facilities with their respective millions of gallons per day of discharge, a common estimator for cost.

V. MANAGING THE PROCESS

At the September 29, 2005, hearing of the Subcommittee, Delegate Lingamfelter, a member of the Subcommittee, clearly identified the challenges Virginia must confront when implementing a complex initiative that will cost from one-half to one billion dollars and require participation by a diverse set of stakeholders.[19] In his presentation, Delegate Lingamfelter proposes several policies that appear essential to successful restoration of the Bay.

- **Do not tie restoration to the so-called 2010 deadline.**

  That deadline involves only planning, not implementation, and has no relationship to the availability of engineering capacity, funding capacity or basic information on sources of impairments.

- **Rank work within phases to meet phased objectives and align funding to these phases.**

  Because we can identify some clear nutrient targets (both point source and non-point source), and because we do not know the source of others, there is a natural phasing that takes advantage of what we know and what we don't. The proposal offered above begins with an attack on known sources, using lowest cost approaches. A second phase builds off the knowledge rising out of the first phase and addresses likely next-best targets. Virginia would need some part of a third phase, high cost, phase only when it know there were no better alternatives.

- **Schedule biennium funding based on realistic expectations.**

  In the absence of multi-year funding, and in light of many competing needs, State funding must be carefully aligned with the reasonably expected needs.

- **Fund the most cost-effective projects first.**

  The size of the need and the knowledge that Virginia can exploit nutrient reduction techniques far less expensive than advanced chemical treatment demands a mechanism to ensure cost-efficient solutions are used first. The phased approach discussed above builds from this policy.

- **Establish an Authority to manage this massive restoration program.**

  Virginia already has a complex bureaucracy working on Chesapeake Bay issues. Although the Chesapeake Bay program has been restructured in the past few years, it is clear the elements in DNR have only partially succeeded in coordination efforts within DNR much less with the Department of Agriculture and Consumer Services.

  A program coordinator reporting directly to both the Secretaries of Natural Resources and Agriculture may help bring the disparate efforts together more effectively, but program coordination alone will not solve the problem. It is not clear, however, that a new

[19] *See*: http://dls.state.va.us/groups/statewaters/meetings/092905/CleaningUpTheBay.pdf .

Authority is the answer. That authority would either duplicate existing services or draw those services into a new organization, forcing that staff to abandon some work that is not well aligned with an Authority's function.

A lower cost and more manageable alternative would be a limited-term strike force that has access to resources within DNR and Agriculture. Its role would be to target all nutrient-related funding (including loans and bond activities) using all available information and expanding the information base, ensure cost-effective, nutrient reduction, facilitate that funding, provide technical assistance, train and coordinate with local staff and manage major implementation projects. Of signal importance on such a strike force would be individuals already successful in fostering implementation of key agricultural NPS best management practices and low-cost point source treatment.

- **Increase Bonding Capacity and Establish "Chesapeake Bay" revenue-based bonds**

  Rather than force Bay restoration to compete with other essential public needs, including other environmental programs, transportation, Medicaid and public safety, a bond program could generate the funds needed for restoration. The Chesapeake Bay Foundation suggests that Virginians would be willing to generate large funds to pay for restoration. Such promises don't translate into support for tax increases, but may well translate into investment in such bonds. Further, the pool of potential bond buyers would stretch well outside the borders of the Commonwealth. Legislative action to expand bonding capacity and a well marketed bond effort could produce all needed funds without resorting to further encroachment on the general fund.

  A second element of the bond approach deserves attention. The proposal would target half the bond funds at non-point source programs. Based on a hard look at the cost of agricultural BMPs and the highly expensive and low cost-effectiveness of urban BMPs, this 50%-50% division of bond funds is probably requires considerable review, as does the total bond amount initially proposed. Delegate Lingamfelter has acknowledged that he offered his proposals to open the debate and this element of his bond proposals may deserve additional attention.

CONCLUSION

Virginia has the opportunity to be the first state to successfully restore its rivers and meet its commitments to restoration of the Chesapeake Bay. Current proposals fail to use existing knowledge about how to target clean-up activities to ensure Virginia meets its goals in the most timely and cost-effective manner possible, using known cost-effective measures. This paper reviews the state of knowledge needed to ensure cost-effective restoration and proposes a phased approach that would target known sources of nutrients first while also relying first on the most cost-effective nutrient reduction measures. The proposal would allow Virginia to rapidly meet its Phosphorous and Sediment goals, and generate as much Nitrogen reduction as other proposals, and at a cost about one-third (37%) of the other proposals.

- End -

Permit No.	On list of 46	Facility	MGD	Pop	Watershed	River Basin	Receiving Water	Impairment	CSO	Nutrient-based Impairment PS	Nutrient-based Impairment NPS	Traditional Plant Total Cost	Irrigation/CNT Total Cost	Irrigation/CNT WQIF Cost (50% STP +Ag Incentive)
POINT SOURCE NUTRIENT IMPAIRMENT														
Chesapeake Bay Watershed Basin														
VA0025542	X	Covington	3	6,471	Upper James.	James	Jackson River	PS & NPS Ag & Urban P	No	Urban	Ag & Urban	$6,300,000	Geo-Infeasible	Geo-Infeasible
VA0063177	X	Richmond (DWI	70	74,999	Middle James	James	James River	NPS Urban N/P/Sed	Yes(31)	Urban		$32,100,000	Geo-Infeasible	Geo-Infeasible
VA0022772	X	Clifton Forge	2	5,772	Upper James	James	Jackson River	PS Urban P	No	Urban		$5,200,000	$2,650,000	$1,350,000
VA0021253	X	Onancock	0.25	2,728	Western Lower Delmarva	Chesapeake Bay	Onancock Creek	DO-PS Urban P	No	Urban		$3,700,000	$1,900,000	$975,000
VA0090671		Alleghany Co - Lower Jackson RRIVER WWTP	2	3,093	Upper James.	James	Jackson River	PS & NPS Ag & Urban P/Sed	No	Urban	Ag & Urban	$5,854,106	$2,977,053	$1,513,527
VA0024732		Massanutten STP	2	2,709	Upper Potomac	Potomac	Quail Run	PS Benthic (DO)	No	Urban		$5,854,106	$2,977,053	$1,513,527
Non-Chesapeake Bay Watershed Basins														
VA0061751		Christiansburg Town	4	8,641	Upper New	New	Crab Creek	PS & Ag NPS P	No	Urban	Ag & Urban	$8,284,455	$4,192,228	$2,121,114
VA0069337		South Hill WWTP	2	4,862	Roanoke Rapids	Roanoke/ Yadkin	Flat Creek	Benthic (PS discharges)	No	Urban		$5,854,106	$2,977,053	$1,513,527
VA0069345		Henry Co PSA	4	5,630	Upper Dan.	Dan	Smith River (lower)	Benthic (PS discharges)	No	Urban	Ag & Urban	$8,284,455	$4,192,228	$2,121,114
NPS NUTRIENT IMPAIRMENT														
Chesapeake Bay Watershed Basin														
VA0064793	X	Middle River	5.3	4,830	Shenandoah	Potomac	Middle River	NPS Ag N/P/Sed	No		Ag	$10,300,000	$5,200,000	$2,625,000
VA0020460	X	Vint Hill	0.95	7,974	Middle Potomac-	Potomac	South Run	Benthic unknown source	No		Ag	$4,500,000	$2,300,000	$1,175,000
VA0026514	X	Dahlgren SD*	1	3,064	Lower Potomac	Potomac	Williams Creek(a)	DO (unknown source)	No		Ag	$1,600,000	$850,000	$450,000
							Williams Creek(b)	DO (unknown source)			Ag			
VA0075434	X	HRSD-West Po	0.6	504	Mattaponi	York	Mattaponi River	NPS Ag N/P	No		Ag	$7,200,000	$3,650,000	$1,850,000
VA0028819	X	Mathews CH	0.1	2,210	Great Wicomico-Piankatank	Chesapeake Bay	Put In Creek	DO (unknown source)	No		Ag	$2,600,000	$1,350,000	$700,000
VA0021288	X	Cape Charles	0.25	1,895	Western Lower Delmarva	Chesapeake Bay	Chesapeake Bay	Benthic unknown source	No		Ag	$3,800,000	$1,950,000	$1,000,000

VA0075191	X	Parkins Mill	2	34,317	Conococheague-Opequon	Potomac	Opequon Creek	NPS Ag & Urban N/P/Sed	No		Ag & Urban	$9,530,000	$4,815,000	$2,432,500
VA0063690	X	Henrico Co.	75	2,885	Conococheague-Opequon	James	Lower James	NPS Ag & Urban N/P/Sed	No		Ag & Urban	$25,300,000	Geo-Infeasible	
VA0025291		Fishersville Regional STP	2	5,701	Shenandoah	Potomac	Christians Creek	NPS Ag N/P/Sed	No		Ag	$5,854,106	$2,977,053	$1,513,527
VA0065552		Opequon Water Reclamation	16	9,437	Conococheague-Opequon	Potomac	Opequon Creek	NPS Ag N/P/Sed	No		Ag	$22,866,547	$11,483,274	$5,766,637
VA0060194		Proctors Creek WWTP	27	14,433	Maury	James	James River	NPS Ag & Urban N/P/Sed	No		Ag & Urban	$36,233,465	Geo-Infeasible	
Non-Chesapeake Bay Watershed Basins														
VA0020940		Big Stone Gap WWTP	2	6,392	Powell		Powell River	NPS Ag & Urban P	No		Ag & Urban	$5,854,106	Geo-Infeasible	
VA0052850		Virginia Tech	0.254	na	Upper New	New	Stroubles Creek	NPS Ag & Urban N/P/Sed	No		Ag & Urban	$3,732,412	$1,916,206	$983,103
VA0062685		Peppers Ferry Regional	9	na	Upper New	New	New River	NPS Ag N/P	No		Ag	$14,360,327	Geo-Infeasible	
												$153,730,964	$36,491,533	
URBAN NPS NUTRIENT IMPAIRMENT												**$252,210,456**		
Chesapeake Bay Watershed Basin														
VA0025151	X	Waynesboro	4	19,180	Shenandoah.	Potomac	South River	NPS Urban (benthic)	No		Urban	$8,600,000	$4,350,000	$2,200,000
Non-Chesapeake Bay Watershed Basins														
VA0067351		Scott County PSA	1.25	11,548	Holston. (TN)	Tennessee/ Big Sandy	Holston River	HG / NPS Urban (benthic)	No		Urban	$4,942,726	Geo-Infeasible	
SHELLFISH & FISH RESTRICTION														
Chesapeake Bay Watershed Basin														
VA0081311	X	HRSD-York	15	12,606	York	York	Back Creek	Shellfish VDH Restriction	No			$37,200,000	Geo-Infeasible	
VA0081299	X	HRSD-Nansem	30	34,230	Lower James	James	James River	Shellfish VDH Restriction	No			$23,500,000	Geo-Infeasible	
VA0081272		HRSD - James River STP	20	47,707	Lower James	James	Newmarket Creek	Shellfish VDH Restriction	No			$27,727,244	Geo-Infeasible	
Non-Chesapeake Bay Watershed Basins														
VA0025020		Western Virginia WTP	42	52,285	Upper Roanoke	Roanoke/ Yadkin	Roanoke	NPS Urban Sed. Fish VDH Restriction PCB	No			$54,461,080	Geo-Infeasible	
VA0020362		South Boston WWTP	2	6,802	Lower Dan	Roanoke/ Yadkin	Dan River	Fish VDH Restriction DDT	No			$5,854,106	$2,977,053	$1,513,527

VA0020451		Altavista Town - WTP	3.6	5,999	Upper Roanoke	Roanoke/ Yadkin	Staunton River	Fish VDH Restriction PCB	No			$7,798,385	$3,949,193	$1,999,596
VA0026409		Colonial Beach	2	4,650	Lower Potomac	Potomac	Monroe Creek	Shellfish VDH Restriction	No1			$5,854,106	$2,977,053	$1,513,527
VA0060593		Danville City - Northside	24	17,062	Lower Dan	Roanoke/ Yadkin	Dan River	Fish VDH Restriction PCB/DDT	No			$32,587,942	Geo-Infeasible	
VA0060844		Blacksburg VPI	9	na	Upper New	New	New River	Fish VDH Restriction PCB/DDT	No			$14,360,327	Geo-Infeasible	
VA0090531		Buchanan Cnty PSA	2	1,528	Upper Levisa	Tennessee/ Big Sandy	Levisa Fork River	Fish PCBs	No			$5,854,106	Geo-Infeasible	
SWIMMING IMPAIRMENT														
Chesapeake Bay Watershed Basin														
VA0089915	X	Hanover Cnty T	5	2,008	Pamunkey	York	Totopotomyoy Creek	pH, fecal	No			$12,000,000	$6,050,000	$3,050,000
VA0025143	X	Arlington*	40	152,922	Middle Potomac-	Potomac	Four Mile Run	NPS fecal	No			$51,590,000	Geo-Infeasible	
VA0060640	X	North River	16	2,872	Shenandoah	Potomac	North River	NPS fecal	No			$23,000,000	$11,550,000	$5,800,000
VA0090263	X	SIL MRSS Timt	1.93	4,147	Shenandoah	Potomac	N.F. Shenandoah	NPS fecal	Yes			$2,500,000	$50,000	$675,000
VA0061590	X	Culpeper	4.5	8,775	Rapidan-Upper Rappahannock	Rappahannock	Mountain Run	NPS fecal	No			$6,900,000	$3,500,000	$1,775,000
VA0025518	X	RWSA-Moores	15	37,943	Rivanna	James	Moores Creek	NPS fecal	No			$18,300,000	$9,200,000	$4,625,000
VA0066630	X	Hopewell WWT	50	18,872	Lower James	James	Gravelly Run-James	NPS fecal	No			$59,300,000	Geo-Infeasible	
VA0089125	X	Haymount	0.96	1,007	Lower Rappahannock	Rappahannock	Lower Rappahannock	Fecal (unknown origin), PCBs	No			$4,300,000	$2,200,000	$1,125,000
VA0060968	X	Aquia	8	28,468	Lower Potomac	Potomac	Austin Run	Fecal (unknown origin)	No			$12,000,000	Geo-Infeasible	
VA0083411	X	Wilderness Sho	1.25	-	Rapidan-Upper Rappahannock	Rappahannock	Rapidan	Fecal (unknown origin)	No			$4,500,000	$2,300,000	$1,175,000
VA0021385	X	Orange	1.5	3,477	Rapidan-Upper Rappahannock	Rappahannock	Rapidan	Fecal (unknown origin)	No			$6,300,000	$3,200,000	$1,625,000
VA0024996	X	Falling Creek	10.1	30,353	Lower James	James	Grindall Creek	Fecal (unknown origin)	No			$6,000,000	Geo-Infeasible	
VA0081230	X	HRSD-Army Ba	18	46,139	Hampton Roads	James	Elizabeth River	Fecal (unknown origin)	No			$37,100,000	Geo-Infeasible	
VA0083135		Farmville WWTP	2.4	3,721	Appomattox	James	James River	Fecal	No			$6,340,176	$3,220,088	$1,635,044
VA0024970	X	Lynchburg	22	20,590	Middle James	James	Middle James	Fecal	Yes (42)			$54,500,000	Geo-Infeasible	

VA0066877		ACSA Stuarts Draft WWTP	1.4	6,867	Shenandoah	Potomac	South River	NPS Ag & Wildlife Fecal	No			$5,125,002	$2,612,501	$1,331,250
VA0088609		Chesterfield County	na	14,433	Maury	James	Powhite Creek	Fecal (Unknown source)	No				maybe	
VA0025437		South Central Wastewater	23	47,362	Appomattox	James	Appomattox	NPS fecal	No			$31,372,767	Geo-Infeasible	
VA0076392		Little Falls Run WTP	13	9,546	Lower Rappahannock	Rappahannock	Rappahannock	NPS fecal / PCB (source unknown)	No			$19,221,024	$9,660,512	$4,855,256
Non-Chesapeake Bay Watershed Basins														
VA0020354		Lawrenceville	1.2	3,619	Meherrin	Chowan R. & Dismal Swamp	Rose Creek	PS fecal (not Lawrenceville)	No			$4,881,967	$2,490,984	$1,270,492
VA0025305		Martinsville City STP	8	11,727	Upper Dan	Roanoke/ Yadkin	Smith River	NPS fecal	No			$13,145,152	Geo-Infeasible	
VA0085952		Rocky Mount Town STP	2	6,311	Upper Roanoke	Roanoke/ Yadkin	Pigg River	NPS fecal	No			$5,854,106	$2,977,053	$1,513,527
VA0022390		BEDFORD STP	2	4,895	Upper Roanoke	Roanoke/ Yadkin	Johns Creek	Fecal & PS Overflow	No			$5,854,106	$2,977,053	$1,513,527
VA0020281		Wytheville WWTP	4	6,540	Upper New	New	Reed Creek	NPS Ag Fecal	No			$8,284,455	$4,192,228	$2,121,114
VA0025054		Bluefield Westside WWTP	5.3	10,798	Middle New	New	Bluestone River	Fecal & PS Overflow	No			$9,864,182	Geo-Infeasible	
VA0086304		Marion WWTP	3.4	7,337	Holston	Tennessee/ Big Sandy	Holston River	NPS - Ag fecal	No			$7,555,351	$3,827,675	$1,938,838
VA0077828		Coeburn Norton Wise	4	4,003	Upper Clinch	Tennessee/ Big Sandy	Guest River	NPS Urban fecal	No			$8,284,455	Geo-Infeasible	
TOXIC AND BENTHIC IMPAIRMENT OF UNKNOWN SOURCE														
Chesapeake Bay Watershed Basin														
VA0067423	X	Tangier Island	0.1	~	Western Lower Delmarva	Chesapeake Bay	Chesapeake Bay	Benthic unknown source	No		Urban	$2,800,000	Geo-Infeasible	
VA0025160	X	Alexandria S.A.	54	112,505	Middle Potomac-	Potomac	Hunting Creek	Ammonia				$69,120,000	Geo-Infeasible	
VA0062812	X	Front Royal	4	15,000	Shenandoah	Potomac	Shenandoah	PCBs	No			$4,800,000	$2,450,000	$1,250,000
VA0081264		HRSD - Chesapeake-Elizabeth	30	57,678	Lynnhaven-Poquoson.	Chesapeake Bay	Chesapeake Bay	NA/ Not shellfish	No			$39,878,988	Geo-Infeasible	
VA0024988		UOSA - Centreville	54	84,789	Middle Potomac	Potomac	Bull Run	Benthic unknown source	No			$69,043,172	Geo-Infeasible	
VA0081256		HRSD - Boat Harbor STP	25	31,795	Hampton Roads	James	Hampton Roads	Benthic (Source unknown)	No			$33,803,116	Geo-Infeasible	

VA0081302		HRSD - Williamsburg STP	22.5	7,221	Lower James	James	James River	Benthic N/P/Sed (Source unknown)	No			$30,765,180	Geo-Infeasible	
Non-Chesapeake Bay Watershed Basins														
VA0023922		Franklin City - STW	2	9,325	Blackwater.	Chowan R. & Dismal Swamp	Blackwater River	Hg (Unknown Source)	No			$5,854,106	$2,977,053	$1,513,527
VA0025194		Blackstone WWTP	2	709	Nottoway	Chowan R. & Dismal Swamp	Hurricane Creek	DO (unknown source)	No			$5,854,106	Geo-Infeasible	
VA0026531		Wolf Creek WTP	2.75	8,046	Holston	Tennessee/ Big Sandy	Wolf Creek	Benthic unknown source	No			$6,765,487	$3,432,744	$1,741,372
NO IMPAIRMENT														
Chesapeake Bay Watershed Basin														
VA0025364	X	Noman Cole	54	30,232	Middle Potomac-	Potomac	Pohick Creek	None	No			$16,000,000	Geo-Infeasible	
VA0020311	X	Strasburg	0.975	4,458	Shenandoah	Potomac	N.F. Shenandoah	None	No			$2,800,000	$1,450,000	$750,000
VA0024724	X	Dale Servic Cor	4	73,684	Middle Potomac-	Potomac	Neabsco Creek	None	No			$1,100,000	Geo-Infeasible	
VA0026441	X	Mt. Jackson	0.6	2,467	Shenandoah	Potomac	N.F. Shenandoah	None	No			$4,100,000	$2,100,000	$1,075,000
VA0022802	X	Basham Simms	1	6,692	Middle Potomac-	Potomac	Goose Creek	None	No			$5,400,000	$2,750,000	$1,400,000
VA0024678	X	Dale Service Cc	4	84,397	Middle Potomac-	Potomac	Neabsco Creek	None	No			$1,100,000	Geo-Infeasible	
VA0091383	X	Broad Run*	20	~	Middle Potomac-	Potomac	Broad Run	None	No			$29,000,000	Uncertain	
VA0021172	X	Warrenton	2.5	10,733	Rapidan-Upper Rappahannock	Rappahannock	Great Run	None	No			$7,000,000	$3,550,000	$1,800,000
VA0025127	X	Fredericksburg	4.5	34,495	Lower Rappahannock	Rappahannock	Rappahannock	None	No			$6,300,000	Geo-Infeasible	
VA0076805	X	Remington	2.5	4,977	Rapidan-Upper Rappahannock	Rappahannock	Tinpot Run	None	No			$8,200,000	$4,150,000	$2,100,000
VA0090212	X	Mountain Run	0.3	6,227	Rapidan-Upper Rappahannock	Rappahannock	Rapidan	None	No			$8,700,000	$4,400,000	$2,225,000
VA0029521	X	Doswell	5.8	1,434	Pamunkey	York	North Anna River	None	No			$6,900,000	$3,500,000	$1,775,000
	X													
VA0073504	X	Caroline County	0.5	958	Mattaponi	York	Polecat Creek	None	No			$3,900,000	$2,000,000	$1,025,000

VA0024899	X	Ashland	2	8,014	Pamunkey	York	Falling Creek	None	No			$2,600,000	$1,350,000	$700,000
VA0021105	X	Gordonsville	0.94	1,587	Pamunkey	York	Carver's Creek	None	No			$5,100,000	$2,600,000	$1,325,000
VA0020991	X	Buena Vista	2.25	7,106	Maury	James	Maury River	None	No			$5,500,000	$2,800,000	$1,425,000
VA0088331	X	Parham Landin	0.568	860	Pamunkey	York	Pamunkey River	None, but DO (unknown source)	No			$9,500,000	$4,800,000	$2,425,000
VA0020346		Emporia WWTP	1.5	6,732	Meherin	York	Falling Run	None	No			$5,246,519	$2,673,260	$1,361,630
VA0081281		HRSD - Virginia Initiative	40	72,741	Hampton Roads	James	Elizabeth River	None	No			$52,030,731	Geo-Infeasible	
VA0088161		Lexington-Rockbridge Regional STP	3	8,848	Maury	James	Maury River	None	No			$7,069,281	$3,584,640	$1,817,320
VA0025658		Massaponax WTP	8	na	Lower Rappahannock	Rappahannock	Rappahannock	None	No			$13,145,152	$6,622,576	$3,336,288
VA0087718		DOC - Coffeewood	0.2	1,403	Rapidan-Upper Rappahannock	Rappahannock	Cabin Rranch	None	No			$3,666,793	$1,883,396	$966,698
Non-Chesapeake Bay Watershed Basins														
VA0089443		Hillsville WWTP	1.25	na	Upper New	New	Little Reed Island Ck	None	No			$4,942,726	$2,521,363	$1,285,681
VA0081248		HRSD - Atlantic STP	36	35,033	Albemarle	Atlantic	Atlantic Ocean	None	No			$47,170,034	Geo-Infeasible	

Impaired Virginia River Reaches

River Basin	Stream Classifications: Supports Uses or of Unknown Quality	Impaired Reaches: 4A	5A	5B	5C	5D	Total Impaired
Chesapeake Bay Watershed							
Ches. Bay Coast	148	0	80	106	4	0	190
Potomac	484	39	214	33	13	13	312
James	826	8	229	7	24		268
Rappahannock	148	5	75	37	19	0	136
York	136	0	72	17	0	0	89
Chowan/Dismal Swamp	101	0	0	85	0	37	122
Subtotal	1843	52	670	285	60	50	1117
Non-Chesapeake Basins							
New	334	10	82	0	2	1	95
Tennessee/Big Sandy	384	21	111	0	0	1	133
Roanoke/Yadkin	451	47	170	0	6	12	235
Subtotal	1169	78	363	0	8	14	463
Total	3012	130	1033	285	68	64	1580

Source: Final 2004 305(b)/303(d) Water Quality Assessment Integrated Report
http://www.deq.virginia.gov/wqa/ir2004.html

River Basin	Category 5 Impaired Waters: Fecal & Bacterial: Point Source	Fecal & Bacterial: Non-Point Source	Fecal & Bacterial: Unknown Source	Benthic & DO: Natural Source	Benthic & DO: Point Source	Benthic & DO: Non-Point Source	Benthic & DO: Unknown Source	Fish & Shellfish	Toxics & pH
Chesapeake Bay Watershed	7	93	277	61	10	42	123	294	90
Ches. Bay Coast	0	0	39	4	1	3	32	135	6
Potomac	0	56	43	5	2	16	27	50	19
James	6	36	87	10	6	11	35	35	18
Rappahannock	0	0	50	3	0	0	3	47	10
York	0	0	8	3	1	12	13	25	19
Chowan/Dismal Swamp	1	1	50	36	0	0	13	2	16
Non-Chesapeake Basins	4	118	82	15	7	54	22	40	6
New	0	40	22	2	0	11	1	5	1
Tennessee/Big Sandy	3	21	27	4	1	33	18	24	1
Roanoke/Yadkin	1	57	33	9	6	10	3	11	4
Total	11	211	359	76	17	96	145	334	96

Source: Final 2004 305(b)/303(d) Water Quality Assessment Integrated Report, Chapter 3.3.
See: http://www.deq.virginia.gov/wqa/pdf/2004ir/irch33ay04.pdf

FULLY SUPPORTING – Waters are supporting one or more designated uses
- EPA Category 1: Attaining all associated designated uses and no designated use is threatened.
- EPA Category 2: Some of the designated uses are met but there is insufficient data to determine if remaining designated uses are met.
  - Va. Category 2A - waters are attaining all of the uses for which they are monitored and there is insufficient data to document the attainment of all uses.
  - Va. Category 2B – waters are of concern to the state but no Water Quality Standard exists for a specific pollutant, or the water exceeds a state screening value. These waters are considered fully supporting with observed effects.

INDETERMINATE – Waters needing additional information
- EPA Category 3: Insufficient data to determine whether any designated uses are met
  - Va. Category 3A - no data are available within the data window of the current assessment to determine if any designated use is attained and the water was not previously listed as impaired.
  - Va. Category 3B - some data exists but is insufficient to determine attainment of designated uses. Such waters will be a prioritized for follow up monitoring.
  - Va. Category 3C- data collected by a citizen monitoring or other organization indicating water quality problems may exist but the methodology and/or data quality has not been approved for a determination of attainment of designated uses. These waters are considered as having insufficient data with observed effects. Such waters will be a prioritized for follow up monitoring.
  - Va. Category 3D – data collected by a citizen monitoring or other organization indicate that designated uses are attained however the methodology and/or data quality has not been approved for such a determination.

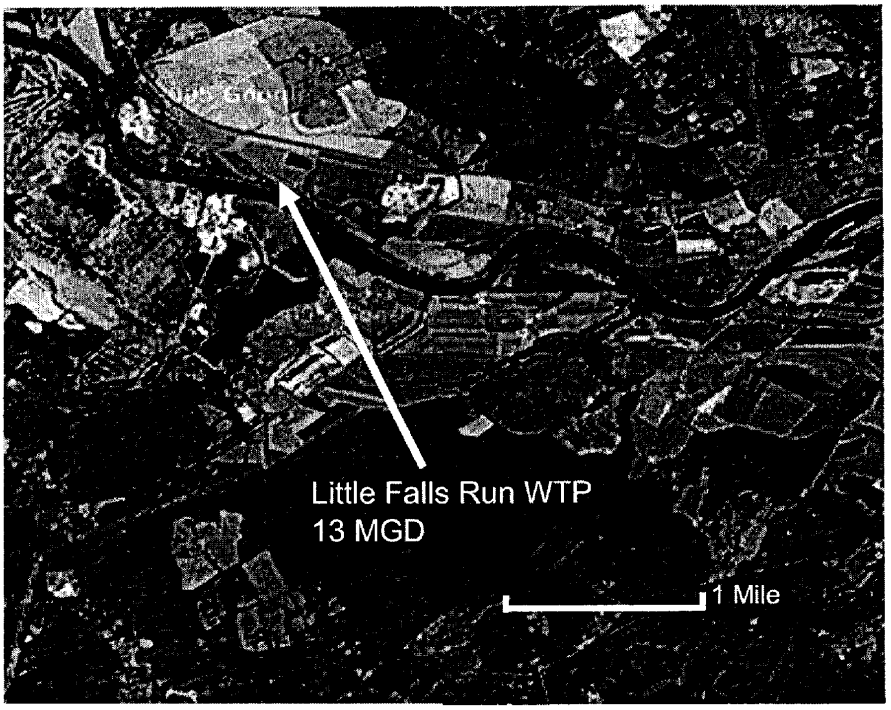
IMPAIRED – Waters are impaired or threatened but a TMDL is not needed.
- EPA Category 4A: impaired or threatened for one or more designated uses but does not require a TMDL because the TMDL for specific pollutant(s) is complete and US EPA approved.
- EPA Category 4B: impaired or threatened for one or more designated uses but does not require the development of a TMDL because other pollution control requirements (such as VPDES limits under a compliance schedule) are reasonably expected to result in attainment of the Water Quality Standard by the next reporting period or permit cycle.
- EPA Category 4C: impaired or threatened for one or more designated uses but does not require a TMDL because the impairment is not caused by a pollutant and/or is determined to be caused by natural conditions.

IMPAIRED – requiring a TMDL
- EPA Category 5: Waters are impaired or threatened and a TMDL is needed.
  - Va. Category 5A - the Water Quality Standard is not attained. The AU is impaired for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).
  - Va. Category 5B –the Water Quality Standard for shellfish use is not attained. One or more pollutants remain requiring TMDL development.
  - Va. Category 5C – the Water Quality Standard is not attained due to suspected natural conditions. The AU is impaired for one or more designated uses by a pollutant(s) and may require a TMDL (303d list). Standards for these waters may be re-evaluated due to the effects of natural conditions.
  - Va. Category 5D - the Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants remain requiring TMDL development.
  - Va. Category 5E – effluent limited waters are not expected to meet compliance schedules by next permit cycle or reporting period.

Regression of the DNR 48
0.906558818

DNR WQIF Cost Estimates	MGD of DNR 46
$1,300,000	0.1
$1,400,000	0.1
$1,850,000	0.25
$1,900,000	0.25
$4,350,000	0.3
$1,950,000	0.5
$4,750,000	0.568
$2,050,000	0.6
$3,600,000	0.6
$2,550,000	0.94
$2,250,000	0.95
$2,150,000	0.96
$1,400,000	0.975
$800,000	1
$2,700,000	1
$2,250,000	1.25
$3,150,000	1.5
$1,250,000	1.93
$4,765,000	2
$1,300,000	2
$2,600,000	2
$2,750,000	2.25
$3,500,000	2.5
$4,100,000	2.5
$3,150,000	3
$2,400,000	4
$4,300,000	4
$550,000	4
$550,000	4
$3,150,000	4.5
$3,450,000	4.5
$6,000,000	5
$5,150,000	5.3
$3,450,000	5.8
$6,000,000	8
$3,000,000	10.1
$18,600,000	15
$9,150,000	15
$11,500,000	16
$18,550,000	18
$14,500,000	20
$27,250,000	22
$11,750,000	30
$25,795,000	40
$29,650,000	50

Permit No.	MGD	Half cost estimate
VA0020940	2	$2,927,053
VA0069337	2	$2,927,053
AGRICULTURAL NPS NUTRIENT IMPAIRMENT		
VA0052850	0.254	$1,866,206
VA0060194	27	$18,116,732
VA0062685	9	$7,180,163
SHELLFISH & FISH RESTRICTION		
VA0020451	3.6	$3,899,193
VA0026409	2	$2,927,053
VA0060593	24	$16,293,971
VA0060844	9	$7,180,163
VA0090531	2	$2,927,053
SWIMMING IMPAIRMENT		
VA0020281	4	$4,142,228
VA0066877	1.4	$2,562,501
VA0076392	13	$9,610,512
VA0086304	3.4	$3,777,675
VA0088609	na	
UNKNOWN TOXIC AND BENTHIC IMPAIRMENT		
VA0024988	54	$34,521,586
VA0025020	42	$27,230,540
VA0026531	2.75	$3,382,744
VA0081256	25	$16,901,558
VA0081302	22.5	$15,382,590
NO IMPAIRMENT		
VA0020346	1.5	$2,623,260
VA0025658	8	$6,572,576
VA0081248	36	$23,585,017
VA0081281	40	$26,015,365
VA0087718	0.2	$1,833,396
VA0088161	3	$3,534,640
VA0089443	1.25	$2,471,363


Little Falls Run WTP
13 MGD
1 Mile